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Anisotropic minimally interacting dark energy models with cosmic strings and a massive scalar field

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This paper deals with the construction of locally rotationally symmetric (LRS) Bianchi type-II (B-II) cosmological models obtained by solving Einstein field equations coupled with an attractive massive scalar field (MSF) when the source of gravitation is the mixture of cosmic string cloud and anisotropic dark energy (DE) fluid which are minimally interacting. We have obtained exact cosmological models by using (i) shear scalar is proportional to the scalar expansion of the space–time and (ii) a power-law relation between the average scale factor of the universe and the scalar field. Our models represent string cosmological model and DE model in the presence of MSF. Using our model, we determine cosmological parameters such as energy densities, deceleration parameter, statefinders and equation of state parameter. We, also, present the tension density and energy density of the string. We discuss the physical aspects of these cosmological

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A Review on Metal-Organic Frameworks as Congenial Heterogeneous Catalysts for Potential Organic Transformations

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Metal-organic frameworks (MOFs) have emerged as versatile candidates of interest in heterogeneous catalysis. Recent research and developments with MOFs positively endorse their role as catalysts in generating invaluable organic compounds. To harness the full potential of MOFs in value-added organic transformation, a comprehensive look at how these materials are likely to involve in the catalytic processes is essential. Mainstays of MOFs such as metal nodes, linkers, encapsulation materials, and enveloped structures tend to produce capable catalytic active sites that offer solutions to reduce human efforts in developing new organic reactions. The main advantages of choosing MOFs as reusable catalysts are the flexible and robust skeleton, regular porosity, high pore volume, and accessible synthesis accompanied with cost-effectiveness. As hosts for active metals, sole MOFs, modified MOFs, and MOFs have made remarkable advances as solid catalysts. The extensive exploration of the MOFs possibly led to their fast adoption in fabricating new biological molecules such as pyridines, quinolines, quinazolinones, imines, and their derivatives. This review covers the varied MOFs and their catalytic properties in facilitating the selective formation of the product organic moieties and interprets MOF's property responsible for their elegant performance.

Keywords: metal-organic frameworks (MOF), heterogeneous catalysis, reusability, catalytic active sites, green principles, value-added organic transformations

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INTRODUCTION

Eco-friendly practices to overcome the concerns related to organic transformations is crucial. The excess use of toxic catalysts cause health hazards and result in the imbalance of ecology. Globally, several catalytic management practices using hazardous chemicals as catalysts have been rejected to safeguard the environment (Dhakshinamoorthy et al., 2011; Sun et al., 2016; Zhao et al., 2016). Many such chemicals as catalysts have already shown the tendency to accumulate and magnify the reaction host system. Thus, these days, focus on environmentally benign catalysts is emerging on a larger scale to counter the catalyst hazards effectively. Heterogeneous catalysis is another promising approach for detoxifying organic reaction contamination caused by harmful chemicals as catalysts (Wolfe et al., 1999; Sun et al., 2014; Kou et al., 2017). With the development of state-of-the-art technology, a roadmap towards cleaner catalytic practices can be envisaged. Difficulties with isolating, reusing, and thermal instability with homogeneous catalysts in organic transformation have significantly

CURVATURE TENSORS IN SP-KENMOTSU MANIFOLDS WITH RESPECT TO QUARTER-SYMMETRIC METRIC CONNECTION

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Abstract

A conformal curvature tensor and con-circular curvature tensor in an SP-Kenmotsu manifold are derived in this article which admits a quarter-symmetric metric connection. Conclusively, we verified our results by considering a case of 3-D SP-Kenmotsu manifold.

Keywords: η-Einstein manifold,SP-Kenmotsu manifold, con-circular curvature tensor, Quarter-symmetric metric connection, Ricci tensor, conformal curvature tensor.
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I. Introduction

A M_n (Riemannian manifold) is symmetrical locally if $\nabla.R = 0$ and symmetric if $R(X,Y).R = 0$ where $R(X,Y)Z = \nabla_X\nabla_Y Z - \nabla_Y\nabla_X Z - \nabla_{[X,Y]}Z$ appears as a derivation. If $R(X,Y).R = 0$, then M_n is turns to be the pseudo symmetric space that is defined with the criteria $R.R = L(g,R)$. A manifold M_n is conformally symmetric if $\nabla.C = 0$ and if $R.C = 0$, it is said to be Weyl semi symmetric which are characterised by the condition $R.C = L_C Q(g,C)$.

Schouten & Friedman proposed the concept of semi-symmetric linear connection on a differentiable manifold. Some of the semi-symmetric curvature criteria in Riemannian manifolds are given by Yano [12].

Semi symmetric metric connection plays a very significant part in the geometry of Riemannian manifolds. For instance, a semi-symmetric metric is the displacement of the earth's surface after a fixed point. A quarter-symmetric connection is a linear connection $\widetilde{\nabla}$ on an n-dimensional Riemannian manifold (M_n, g) if $\widetilde{T}$ is $\widetilde{T}(X,Y) = \eta(Y)\phi X - \eta(X)\phi Y$.

Sato [8] proposed concepts of almost para contact Riemannian manifold. In 1977, Matsumoto and Adati [1] characterized special para-Sasakian as well as para-Sasakian manifolds as a particular type of almost contact Riemannian manifolds. Before Sato, Kenmotsu [6] characterized a type of this manifold. In 1995, Sinha and Sai Prasad [9] characterized a type of almost para contact metric manifolds mainly para-Kenmotsu and special para-Kenmotsu manifolds. For the literature, on Para-Kenmotsu manifolds one can refer to Balga [2], Srivastava and Srivastava [10], Olszak [7] .

On the other hand, various geometers of Riemannian manifolds and specifically, SP-Sasakian

A NOVEL TRANSPORTATION APPROACH TO SOLVING TYPE - 2 TRIANGULAR INTUITIONISTIC FUZZY TRANSPORTATION PROBLEMS

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Abstract

In this article we propose a new transportation strategy to achieve an ideal answer for triangular intuitionistic fuzzy transportation problem of type – 2 i.e., limits and requests are considered as real numbers and the transportation cost from cause to objective is considered as triangular intuitionistic fuzzy numbers as product cost per unit. The proposed method is solving by using ranking function. The appropriate response system is delineated with a numerical model.

Keywords: IFN, TIFN, IF Optimum solution, TIFTP of type-2.

I. Introduction

In genuine world, there are general complex circumstances in each field, in which specialists and chiefs battle with uncertainty and hesitation. In useful circumstances, assortment of fresh information of different boundaries is troublesome because of absence of precise interchanges, mistake in information, market information and consumer loyalties. The data accessible is some of the time ambiguous and inadequate. The real-life problems, when defined by the decision maker with uncertainty leads to the notion of fuzzy sets. Due to imprecise information, the exact evaluation of participation values is not possible. Moreover, the evaluation of non-participation esteems is consistently impossible. This prompts an in deterministic climate where dithering endures. Managing estimated data while deciding, idea of fuzziness was presented by Bellman and Zadeh [6]. K. T, Atanassov [4] presented idea of Intuitionistic fuzzy set hypothesis, which is more able to manage such issues. B. Chetia and P. K. Das [1] demonstrated a few outcomes on intuitionistic fuzzy delicate network. Intuitionistic fuzzy sets [5], [7], [8] discovered to be exceptionally powerful in managing ambiguity, among a few higher request fuzzy sets. S.K. Singh, S.P. Yadav [9] proposed their strategies to address case 2 sort of intuitionistic fuzzy transportation problem (IFTP) for example IFTP of type-2. G. Gupta and A. Kumara [3] a capable technique was introduced in which limit and request factors are taken as TIFN's utilized in this article to tackle mathematical model. This paper proposes another transportation strategy for tackling TIFTP of type – 2 by applying ranking function found in [2].

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Study of Thermal Characteristics Augmentation of the Aluminium Oxide Nano Fluid with Different Base Fluids

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heat transfer augmentation, aluminium oxide nano fluid, ethylene glycol, square cavity, finite element model, CFD study, square element mesh grid, isothermal wall

ABSTRACT

Nanofluids have been widely studied over the past decade due to their extremely promising findings in terms of thermal transfer improvement techniques. These fluids have a number of potential benefits, including enhanced thermal resistance and heat transfer characteristics. The current study examines the numerical behavior of the square cavity loaded with a nanofluid for thermal enhancement under three different base fluid conditions (water, water-EG mixture, and EG). This square cavity edge is maintained at a length of 8 cm. Side edges are kept at constant high and low-temperature conditions, and bottom sides are insulated. Additionally, it is found that when the base fluid's composition changes between EG to water, heat transmission is increased. The (*hnfhbf*) ratio improves when the percent vol density of Al_2O_3 nanoparticle increases, and an increase of up to 4.5 percent is possible. Consequently, the paper concluded that the use of nanofluids aids in heat transfer enhancement.

1. INTRODUCTION

Nanofluids are binary mixtures of a base fluid with metallic particles (10 nm - 100 nm in size). The inclusion of nano-sized metal particles colloquially referred to as nanoparticles have been found to enhance the thermal of the fluid, thus increasing the heat transfer phenomena. However, the degree to which nanoparticles absorb heat may be dependent on their volume concentration. Nanoparticles may improve heat transmission up to a specific point in their volume concentration range and may reduce it beyond that point. This range of optimum nanoparticle volume concentration levels may also be dependent on the concentration of the base fluid and the source's temperature. In aggregate, it becomes a highly complicated issue, and more research is necessary to fully comprehend this phenomenon.

Several significant research has been conducted before to better understand the improvement of heat transfer through nanofluids [1, 2]. Kamyar et al. [3] used the lattice Boltzmann method to compare a numerical model to experimental data for a nanofluid system. They demonstrated that numerical methods were in close accord with experimental findings. They suggested that rather than modeling the nanofluid as either a single-phase system, a two-phase system is more appropriate. Additionally, they recommended that numerical modeling of nanofluids should include temperature-dependent thermophysical characteristics.

Li and Peterson [4] studied the buoyancy-based convection in an aluminium oxide nano fluid. Effect of nano-concentration was analysed for 0.5 to 6%. They inferred that with the advance in volume concentration, the heat transmission decreased. They ascribed this degradation to the nanofluid's increased viscosity and the occurrence of Brownian motion. They hypothesized that perhaps the thermophoresis impact delayed the start of natural convection. The findings of this study contradicted earlier findings.

Dagtekin and Oztop [5] investigated the impact of 2 different thermal partitions, their size, and placement inside an enclosure on natural circulation phenomena. Hwang et al. [6] examined a rectangular cavity and performed a buoyancy-driven heat transfer study of water-based (Al_2O_3) nanofluids. The ratio of the heat transfer coefficients of nanofluids to the base fluid falls as the size of the nanoparticles rises. Putra et al. [7] conducted heat transfer tests on a cylindrical device having a bottom and top thermal temperature and nanofluid. There was no indication of stratification of concentration layers. However, there was a reduction in spontaneous convective heat transmission. This decrease was attributable to the nanoparticles' concentration and the cylinder's aspect ratio. Goktepe et al. [8] compared single-phase and two-phase models for nanofluid convection at the entrance of an evenly heated tube. Numerous experts have done further study in nanofluids [9, 10]. Nguyen et al. [11] investigated the impact of nanoparticle size on a water aluminum oxide nanofluid. They tested the viscosity of two distinct particle sizes at various temperatures experimentally. Yazdi et al. [12] investigated the impact of Brownian motion upon this temperature increase of a nanofluid in a cavity. They examined Brownian motion's impact on a hollow loaded with water and Al_2O_3 nanoparticles. Buongiorno [13], Pak and Cho [14] investigated the impact of the nanofluid in a circular tube on oxide dual metallic nano atoms of alumina (Al_2O_3) & titanium oxide (TiO_2). They studied the heat transport behavior of a circular pipe and calculated the turbulent friction. Finally, Ahadi et al. [15] investigated the Soret effect's impact on the heat transmission of nanofluids.

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ORIGINAL RESEARCH ARTICLE

Modified Monopole–CDR Hybrid Antenna

Rahul Kumar Hindustani[1] · Prakash Kumar Panda[2] · Hemanta Kumar Sahu[3]

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Abstract
This paper presents bandwidth enhancement of a monopole antenna by hybridization with cylindrical dielectric resonator (CDR) elements. Dual resonance of the monopole is obtained when the electric current distribution is controlled by adding metallic branches and metallic sphere components. Two prototypes are proposed, incorporating the dual monopole modes and hybrid automatic $(HEM)_{11\delta}$ mode of CDR elements, promising an ultra-wideband (UWB) response with an omnidirectional radiation pattern. The first prototype is composed of two CDRs and a monopole branch which gives an operating bandwidth of 67.25% (6.01–12.1 GHz). The second prototype, with a small metallic sphere-loaded monopole, is surrounded symmetrically by four CDR elements. As a result, the impedance bandwidth is enhanced up to 76.61% (6.2–13.9 GHz). The simulated results including reflection coefficients, radiation patterns, and antenna gains are compared with the experimental results of the fabricated prototype, and good agreement is found between them.

Keywords Branched monopole · CDR (cylindrical dielectric resonator) · monopole · UWB (ultra-wideband)

Introduction

Advancements in antenna engineering have been made possible through innovation of interesting techniques, one of which is hybridization, where the best features of the individual domain are integrated to achieve even better outcomes. This hybridization technique works well for a simple quarter-wave monopole antenna which suffers from an inherent narrow impedance bandwidth. The dielectric resonator-based hybridization technique is one of the best choices to overcome these shortcomings.[1] It provides several advantages for antennas including compact size, reduced surface waves, low conductor loss, and wide impedance bandwidth.[2] Hybridization of a monopole antenna and a cylindrical dielectric resonator has garnered increasing attention due to the wideband characteristics that can be achieved.[3–7] Such antennas reported in the literature have three resonant modes. The lowest and highest resonance modes are due to the monopole and the excitation of the transverse magnetic ($TM_{01\delta}$) mode of the dielectric resonator, respectively. The central resonance occurs due to the coupling effect between the monopole and dielectric resonator. An additional resonant mode can also be introduced to further increase the impedance bandwidth of the antenna.[5–7] The literature also suggests other structures such as short-broadband monopole,[8] annular dielectric resonator antenna (DRA),[9–10] multiple cylindrical dielectric resonator (CDR) elements,[11] hemispherical DRA,[12–15] and half-split cylindrical DRA (CDRA),[16–17] which are integrated with monopole antennas for bandwidth enhancement.

This paper presents a very simple but unique technique to enhance the bandwidth of a monopole antenna. Two low-profile hybrid designs are proposed through a combination of electric monopole and CDR (Fig. 1a and b). These structures are inspired by the concept of monopole branching which can generate closely spaced multiple resonances by modifying the electric current distribution along the length of monopole.[18–26] Both designs are simulated followed by a validation in a fully automated anechoic chamber. All the radiation characteristics are discussed in successive sections. The measured impedance bandwidth achieved for prototype

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Research Article

Excellent Catalytic Activity of Two Cd(II) Metal-Organic Frameworks in The Synthesis of Benzothiazolo-Pyrimidines

Dr. Kranthi Kumar Gangu, Dr. Satya Guru Tharividi, Dr. Nagaraju Kerru, Prof. Sreekantha B. Jonnalagadda

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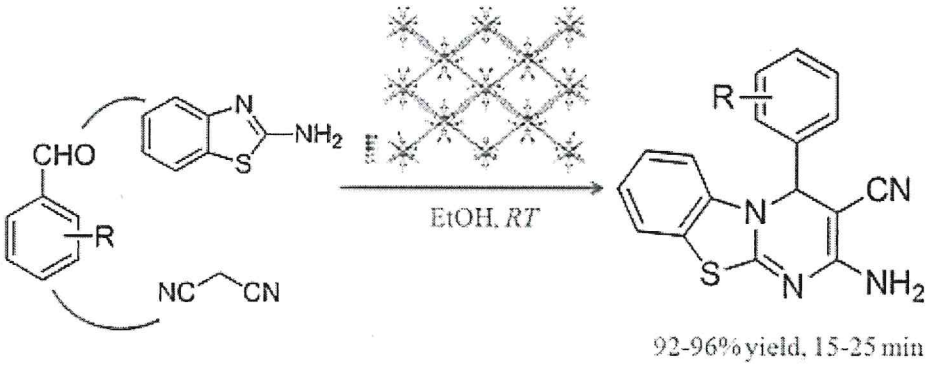
Abstract

Eight novel benzothiazolo-pyrimidines were generated with 92–96 % yield in ethanol at room temperature with a short reaction time of 15–25 min. One-pot multi-component fusion of selected substituted benzaldehyde, malononitrile and 2-amino benzothiazol to synthesise medicinally valuable benzothiazolo-pyrimidine derivatives. Cd(II) and 2,6-naphthalene dicarboxylate based porous metal-organic frameworks were employed as solid catalysts for accelerating organic transformation with high atom economy and yield.



Abstract

We report the noteworthy catalytic activity of two three-dimensional, rigid and porous Metal-Organic Frameworks (MOFs) constructed from Cd(II) and 2,6-naphthalene dicarboxylic acid (2,6-ndc) ligand with different structural arrangements, namely $[Cd_3(2,6\text{-}ndc)_3(DMF)_4(NO_3)]^-$(**1**) and $[Cd_2(2,6\text{-}ndc)_2(DMF)_2]$ (**2**) in organic synthesis. Excellent porosity and Lewis acidic/basic centres accrued in the structural arrangement rendered both superb catalyst characteristics. Both MOFs exhibited perfect catalytic activity for the one-pot fusion of chosen substituted benzaldehyde, malononitrile and 2-amino benzothiazol to synthesise medicinally valuable benzothiazolo-pyrimidine derivatives. Eight novel benzothiazolo-pyrimidines were generated with 92–96 % yield in ethanol at

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Inhibitory and synergistic effects on thermal behaviour and char characteristics during the co-pyrolysis of biomass and single-use plastics

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ABSTRACT

The co-pyrolytic behaviour of single-use plastics (Polystyrene, Low-density polyethylene) and Eucalyptus biomass was investigated at variable temperatures (300, 400, 500, and 600 °C) and the effects of their interactions on the characteristics of solid chars were also studied. The variation in thermal profiles of 'Δ Mass loss%' showed the inhibitory and synergistic effects of plastics on the biomass degradation, resulting in higher and lower yields of char composite, respectively. The blend containing polystyrene exhibited the highest synergistic (Δ M ≈ 15.1) and inhibitory (Δ M ≈ - 4) effects. The thermal kinetics of blends also indicated the presence of both the effects through relatively higher and lower apparent activation energies compared to the calculated, before and during the degradation of plastics. Despite low fixed carbon contents and high volatile matter, polymer-coated char composites had higher fuel value indices (36–136%), energy yields (1–26%) and calorific values (15–21%), relative to biochar. After the complete degradation of plastics, char composites exhibited higher values of electrical conductivity (2–40%), surface area (15–64%), and cation exchange capacity (5–19%). These properties advocate the flexibility of char composites' applicability as solid fuel or soil amender depending on the optimized conditions of co-pyrolysis.

1. Introduction

The faltering momentum behind innovations to achieve global energy security is a matter of deep concern [1]. It comes in the wake of ever-expanding needs for innovations in all the growing economies, driven by technological advances and automation in every conceivable sector. The present pace of transition from fossil fuels to renewables has not been able to keep up with these accelerating energy demands. On the other hand, the world is still in pursuit of sustainable waste management strategies for single-use plastics (SUP), whose ubiquity and persistence makes it an arduous task [2]. Especially, for low value SUPs made of thin film and foam, high processing costs and low quality of recycled products limit the efficacy of recycling in their management [3].

Biofuels are often termed as one of the viable near-term renewable alternatives to fossil-based fuels [4]. Especially, lignocellulosic feedstocks are viewed as the future of renewable liquid fuels because of their abundance and high yields per unit of the land area [5]. The thermochemical conversion of biomass has been an attractive technology over the years for the same, owing to its flexibility in terms of products and the process. Although promising, its gaseous and liquid intermediates have lower heating value relative to petroleum-based fuels owing to their high intrinsic oxygen content, and so needs further upgradation [6]. While deoxygenation demands relatively complex facilities with high hydrogen inputs and capital costs [5], hydrodeoxygenation through co-feeding of plastics (a rich source of hydrogen) with biomass has achieved a significant reputation in recent years [7–9]. Its ability to cater to energy security and waste management, along with the

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Char from the co-pyrolysis of Eucalyptus wood and low-density polyethylene for use as high-quality fuel: Influence of process parameters

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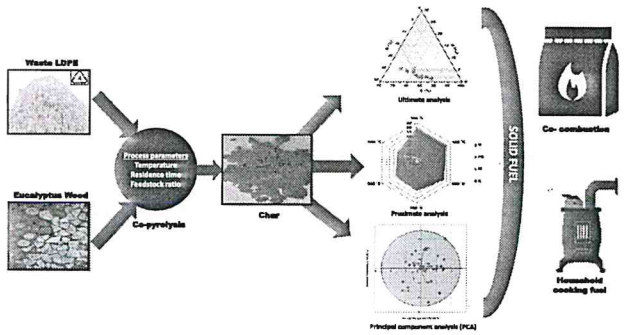
HIGHLIGHTS

- The properties of char of different temperature, residence time and feedstock ratio were compared.
- Co-pyrolysis of WLDPE with Eucalyptus wood enhanced the yield and productivity of char.
- The chars had high carbon content and energy density with low volatile content.
- The fuel value indices of the chars were > 500 GJ/m^3.
- The thermal properties of char indicated its strong potential as alternate solid fuel.

GRAPHICAL ABSTRACT



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ABSTRACT

Providing a valuable application to the under-utilized solid residue of co-pyrolysis of biomass and plastics could substantially improve economic and environmental sustainability of the process, thereby fostering circular economy. This study focuses on the variation of thermal and physiochemical characteristics of solid char, produced from the *co-pyrolysis* of waste low-density polyethylene (WLDPE) and Eucalyptus wood with varying pyrolysis temperatures from 300 to 550 °C, residence times of 90–150 min, and relative percentage of 33% and 25% (w/w) WLDPE in the feedstock. The highest values of yield (37%), energy density (1.25) and high heat value (31 MJ/Kg) were observed with the char produced at 300 °C. The physical inhibition caused by the overlaying plastic coating on the surface of the char below 450 °C resulted in the same. However, with the increase in temperature, increase in fuel ratio by 78–79% and fixed carbon content by 68–69% were observed. The highest concentrations of fixed carbon (39%), fuel ratio (0.81) along with the lowest O/C and H/C ratios (0.07 and 0.13) were observed with the chars produced above 450 °C depicting their high degree of carbonization. The fuel value indices of all the chars were > 500 GJ/m^3 indicating their suitability as high-quality fuels. Significant influences of residence time and feedstock ratio were also observed on properties of the char. The analysis of variance and principal component analysis also depicted significant variations in the properties of the char produced

Abbreviations: WLDPE, Waste Low density polyethylene.

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New Measurements of Internal Conversion Coefficients in {}({111}) Cd

Madhusudhana Rao, K.; **Vijay Sai, K.**; **Rajasekhar, E.**; **Seetharaman, Deepa**; **Rani Rao, Dwaraka**; **Venkataramaniah, K.**

The 7.5-day beta decay of ^{111}Ag is studied with a 60 cc HPGe gamma spectrometer system and a high transmission Mini-Orange magnetic spectrometer. Precise gamma energies and relative intensities of fourteen gamma transitions and conversion electron intensities of sixteen conversion lines of eleven gamma transitions have been determined. Normalized Peak to Gamma method has been used for the determination of K and L conversion coefficients of most of the gamma transitions in ^{111}Cd for the first time, and compared with the theoretical values for assignment of multipolarities. The present conversion electron intensities would be of great use for calibrating electron detectors and electron transporters.

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MDPI

Review

Biochar-Supported TiO_2-Based Nanocomposites for the Photocatalytic Degradation of Sulfamethoxazole in Water—A Review

Subhash Chandra [1,†], Pravin Jagdale [2,†], Isha Medha [1,3,*], Ashwani Kumar Tiwari [4], Mattia Bartoli [2], Antonio De Nino [5] and Fabrizio Olivito [5,*]

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† These authors contributed equally to this work.

Abstract: Sulfamethoxazole (SMX) is a frequently used antibiotic for the treatment of urinary tract, respiratory, and intestinal infections and as a supplement in livestock or fishery farming to boost production. The release of SMX into the environment can lead to the development of antibiotic resistance among the microbial community, which can lead to frequent clinical infections. SMX removal from water is usually done through advanced treatment processes, such as adsorption, photocatalytic oxidation, and biodegradation. Among them, the advanced oxidation process using TiO_2 and its composites is being widely used. TiO_2 is a widely used photocatalyst; however, it has certain limitations, such as low visible light response and quick recombination of e^-/h^+ pairs. Integrating the biochar with TiO_2 nanoparticles can overcome such limitations. The biochar-supported TiO_2 composites showed a significant increase in the photocatalytic activities in the UV-visible range, which resulted in a substantial increase in the degradation of SMX in water. The present review has critically reviewed the methods of biochar TiO_2 composite synthesis, the effect of biochar integration with the TiO_2 on its physicochemical properties, and the chemical pathways through which the biochar/TiO_2 composite degrades the SMX in water or aqueous solution. The degradation of SMX using photocatalysis can be considered a useful model, and the research studies presented in this review will allow extending this area of research on other types of similar pharmaceuticals or pollutants in general in the future.

Keywords: sulfamethoxazole; photocatalysis; biochar; titanium oxide and antibiotic

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1. Introduction

Water is an important resource for the living of animals, aquatic life, and human beings. During past decades, a continuous increase in the worldwide population and industrial activities have rapidly increased the water demand among the communities. Therefore, it is very much necessary to fulfil the water demand among the communities while maintaining the ecological balance [1]. However, due to the rapid industrialization and change in living style, the water quality in the natural resources such as rivers, lakes, and groundwater has substantially deteriorated due to the release of the pollutants [2,3]. In recent years, the production of antibiotics from pharmaceutical industries and their consumption by humans and animals has significantly increased due to the frequent endemic and pandemic episodes such as COVID-19, Ebola, and Swine flu [4,5]. The high

RIS Assisted Dual-Hop Mixed PLC/RF for Smart Grid Applications

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Ashish Kumar Padhan ; Hemanta Kumar Sahu ; P. R. Sahu ; S. R. Samantaray All Authors

Abstract: In this letter, we analyze the performance of reconfigurable intelligent surface (RIS) assisted mixed power line communication (PLC)/radio frequency (RF) system in smart ... **View more**

Metadata

Abstract:
In this letter, we analyze the performance of reconfigurable intelligent surface (RIS) assisted mixed power line communication (PLC)/radio frequency (RF) system in smart grid application. In a smart grid, the data concentrator (DC) plays an important role in communication between the home appliances through the access point (AP). The DC can communicate using the existing PLC up to the AP, and the AP interacts with the home appliances with advanced communication technology like RIS-based RF communication. The modulation scheme is considered here as binary phase-shift keying (BPSK) modulation. Based on the system model, a closed-form expression for average bit error probability (ABEP) and outage probability (OP) are derived and analyzed by varying the various parameters like the number of reflectors in the RIS, impulsive noise scenario in the PLC channel.

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Structural and magnetic properties of nanocrystalline equi-atomic spinel high-entropy oxide $(AlCoFeMnNi)_3O_4$ synthesised by microwave assisted co-precipitation technique

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ABSTRACT

Single phase equi-atomic $(Al_{0.2}Co_{0.2}Fe_{0.2}Mn_{0.2}Ni_{0.2})_3O_4$ high-entropy oxide (HEO) having spinel structure was synthesised employing simple and cost effective microwave assisted co-precipitation technique, followed by calcination at 500 °C. The material obtained was highly crystalline and stable at higher temperatures. The uniformity in elemental distribution was apprehended through STEM-EDS elemental mapping. The X-ray photoelectron spectroscopy confirmed +3 ionic state for Fe and Al, while other elements oxidised to higher ionic states to maintain charge neutrality. Ferrimagnetic behaviour was confirmed for the obtained HEO through magnetic characterisations.

1. Introduction

In recent years, the concept of entropy stabilisation to obtain a single-phase structure has been extended from high-entropy alloys (HEAs) to several classes of materials including carbides [1], borides [2] and oxides [3]. These materials contain five or more elements or ions in nearly equi-molar composition but have a single phase structure favoured by their high configurationally entropy [4]. While the HEAs were the focus of research for the last decade due to their augmented properties compared to conventional alloys, the current focus has been shifted to other high-entropy systems such as entropy-stabilised oxides or high-entropy oxides (HEOs) unfolding their potential application in energy storage [5,6], catalysis [7], dielectrics [8] and magnetic [9].

The interest in HEOs advanced after the pioneering work of Rost et al. in 2015, where they had reported the formation of single-phase (Co0.2Cu0.2Mg0.2Ni0.2Zn)O rock salt structure in bulk ceramic through conventional high temperature solid-state reaction [3]. The HEOs have a tendency to form a simple solid solution structure, rather than multiple inter-oxide phases as in heavily doped systems, favoured by their high configurational entropy of mixing. Advancing in the field, several new HEOs crystallising in perovskite [10], fluorite [11] or spinel [12] structures have been reported. The interesting aspect of such system is the incorporation of multiple elements, which render them with tailorable properties that may find applications in different spaces such as magnetic, catalytic, energy storage and dielectrics.

In the scientific community, spinels (ferrites) are one of the most studied materials because of their wide array of applications not only in magnetic but also in electronic, catalytic and biomedical field [13]. Spinel ferrites are having generic formula MFe_2O_4 (M = Mn, Co, Ni, Cu or Zn), generally crystallises into a closed-pack cubic structure of oxygen ions in which metal cations occupy the tetrahedral (A) and octahedral (B) interstitial sites. The magnetic behaviour of spinel ferrites is reliant on the super-exchange interactions at tetrahedral and octahedral sub-lattices (A-O-B, A-O-A and B-O-B interactions)

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International Journal of Mechanical Engineering

Optimization of injection and spark timing in direct injection stratified charge (DISC) engine fueled with gasoline-ethanol blend

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Abstract - Direct injection stratified charge (DISC) engine is a hybrid concept between compression ignition and spark ignition engines. DISC engine incorporates some best features of both CI and SI engine with its additional own advantage. Multi-fuels can be used in this engine with improvement in thermal efficiency and reduction in harmful emissions like NOx. This includes multi-fuel capability, high thermal efficiency and low NOx emission production. Fuel is injected just before TDC position in this engine and the spark is used for the initiation of the combustion process. Throttling pressure drop losses are eliminated in this engine; as the engine power output is varied by regulating the fuel supply by keeping the air supply same. The present paper describes optimization of injection and spark timing, performance and emission characteristics of DISC engine using gasoline-ethanol blend. On the basis of experimentation, DISC engine runs well with ethanol and ethanol-gasoline blends. E50 (50% ethanol + 50% gasoline) is found to be more suitable blend with significantly reduced HC, CO, NOx emissions and with marginal reduction in brake thermal efficiency compared to pure gasoline.

Index Terms - Brake thermal efficiency, compression ratio, Disc engine, Ethanol, Emissions,

1. INTRODUCTION

Worldwide growing concern for environmental degradation due to harmful emissions coming from engine exhaust and energy security has put immense pressure on the engine researchers for modification of the engine technology [1,2]. SI engines operates at stoichiometric air fuel ratio, which provides clean burn and negligible emissions, while their performance is limited due to lower compression ratio and throttling losses [1,2]. Whereas, diesel engines are lean combustion engines giving lower concentration of CO and HC in exhaust emission but NOX and smoke are major pollutants due to high combustion temperature. Besides these, the diesel engines can emit a little amount of SO2 if the fuel contains sulphates. It is difficult to manage with compression ignition (CI) engine to satisfy forthcoming emission regulations [3,4]. The direct injection stratified charge (DISC) engine utilizes the features of both DI compression ignition and PFI spark ignition engine. Theoretically, this lean burn combustion are fuel efficient at partial load condition and better engine performance over port fuel injection at full load condition [5,6]. It can reduce the fuel consumption by 40% during idling and by 35% at mid load and speed over the conventional SI engine [7]. It can be operated over a wide range of load and the fuel supply can be varied from lean to rich. In-cylinder direct injection of fuel creates partial fuel stratification where fuel rich zone forms near the region of spark plug this demonstrates improved combustion in ultra-lean zones provide good combustion ignition stability [8]. The in-cylinder DI during the compression stroke produces the cooling effects due to the fuel evaporation that helps to avoid engine knock. The stratified mixture is also beneficial in avoiding scavenging losses during the gas exchange process. This

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HPLC Bioassay of Elvitegravir using a Molecularly Imprinted Polymer Based Solid Phase Extraction in RAT Plasma: Application to Pharmacokinetic Studies

Nimmu Narendra Varma, Challa Gangu Naidu ✉, Bondigalla Ramachandra & Arnipalli Manikanta Swamy

Journal of Analytical Chemistry **76**, 1172–1181 (2021)

Abstract

A water-compatible molecularly imprinted polymer (**MIP**) was prepared for specific extraction of HIV-1 integrase inhibitor elvitegravir (**EVG**). It was prepared by a non-covalent free radical polymerization process using methacrylic acid as a monomer and elvitegravir as a template molecule. The MIP based solid phase extraction (**MIP–SPE**) cartridge was constructed for specific extraction of EVG from rat plasma samples. The effect of porogenic solvents, cross linker, pH and monomer to template ratio were studied. The developed HPLC method was validated as per ICH guidelines. The recovery of EVG using MIP–SPE technique was 98%. The LOD and LOQ of EVG were 0.01 and 0.05 µg/mL, respectively. The established method may

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Efficient multiplexing using delayed CSI in few-mode fiber links

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ABSTRACT

The constant demand for high data rates has resulted in few-mode optical fiber (FMF) based multiplexed systems an attractive solution. While the separability of FMF modes permits effective multiplexing, modal dispersion limits data rates. Conventional signal processing based approaches to compensate for modal dispersion incur significant computational complexity. On the other hand of principal modes (PMs) can mitigate dispersion with very little compensation requirements at the receiver. However, in the presence of high mode-dependent losses (MDL), the PMs' performance degrades significantly. In this paper, we propose the use of a polar decomposition based scheme, wherein the impairments of the fiber can be viewed as a cascade of a dispersive system and a lossy (MDL) system. Compensating for the MDL using polar decomposition permits the use of PMs with near optimal performance. Further, we discuss effective quantization techniques to track the variation of PMs and propose effective low-rate feedback mechanisms for PM feedback to the transmitter for optimized transmission, with interpolation across WDM channels to reduce the feedback burden. Finally, we also discuss the impact of delay in feedback on achievable rate when the fiber channel undergoes temporal variation. Simulations reveal that the polar decomposition and quantized PM approach yields effective data rates for various fiber conditions, even with temporal channel variations, thereby indicating that this would be a promising solution for low complexity multiplexing based FMF systems.

1. Introduction

Optical fibers are known to offer large bandwidths and support high data rates, thereby making them suitable for high speed communication links. While single-mode fibers (SMFs) are used most commonly on account of their high bandwidths, recent work has shown that multimode fibers (MMFs) can enable parallel transmission of data through their multitude of modes. These modes arise as a natural consequence of the fact that fibers are guided media. A special class of modes, called principal modes (PMs) [1], have been shown to limit the impact of modal dispersion in MMFs. These can be viewed as a natural extension of the principal states of polarization to multimode fibers [2]. Since the recent increase in bandwidth demands has led to the requirements that could exceed the current fiber limits, newer techniques are needed to enhance data rates through optical fibers. This has led to the consideration of spatial multiplexing through fibers as a means to further increase data rates. Several approaches for utilizing the capabilities of MMFs have been explored to enable efficient multiplexing of signals through MMFs, using the technique of multiple-input multiple-output (MIMO) communication using mode division multiplexing (MDM) [3,4]. However, modal dispersion and intermodal mixing limits the efficiency of multiplexing [5], which is the primary motivation for using PMs.

In fibers without mode-dependent losses, dispersion-free transmission can be achieved using principal modes (PMs) that are also orthogonal, thus permitting effective multiplexing. Experimental results have revealed that PMs are effective in combating dispersion in FMF and MMFs [6–8]. However, the PMs' dispersion-free properties hold only over limited bandwidth ranges [9,10]. As the modulation bandwidth increases, dispersion also increases. Crosstalk at the receiver influences the transmission performance, especially at higher bitrates, due to the frequency dependence of the PMs, and each PM interferes with others at the receiver [11]. To overcome these limits requires significant optical and electronic processing at the receiver, which increases the receiver cost and complexity. Reducing the complexity of such receivers is a topic of active research. One approach that has been popular in the context of wireless MIMO systems is the use of channel state information feedback at the transmitter [12]. Motivated by this, we explore the utility of the feedback of channel state information (CSI) to the transmitter from the

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Full length article

An effective metaheuristic based node localization technique for wireless sensor networks enabled indoor communication

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ABSTRACT

Recently, wireless sensor network (WSN) enabled indoor communication provides an effective and flexible method for local area networks mainly in large buildings or in a group of several buildings. Node localization can be considered as a major process which helps to calculate the coordinate points of the unknown nodes with the assistance of known (anchor) nodes. Earlier studies have considered node localization problem as an NP hard problem. Several metaheuristics techniques are employed for resolving the localization problem in WSN that extremely decreases the localization error. This paper designs an effective metaheuristic-based Group Teaching Optimization Algorithm for Node Localization (GTOA-NL) technique for WSN. The goal of the GTOA-NL technique is to determine the position of the unknown nodes by the use of anchor nodes in the WSN with minimum localization error and maximum localization accuracy. The presented GTOA is stimulated from the group teaching strategy and it can be used for optimization process with no loss of generality. In order to guarantee the effective node localization performance of the presented GTOA-NL model, an extensive set of simulations were performed to highlight the supremacy of the GTOA-NL model. The obtained results have ensured the superior performance of the GTOA-NL model over the other compared methods under varying number of anchor nodes, ranging error, and transmission range.

1. Introduction

The development of new wireless communication technologies denotes a global revolution that is altering the way we interact with and learn about the environment. An efficient inexpensive wireless communication has initiated a period of highly connected societies and serves as a strong driver of business innovation. The utilization of wireless-enabled technologies such as the Internet of Things (IoT) and WSN suffer from several issues from physical network architectures to data analytics. A major issue is to develop effective techniques to integrate, operate, and manage large scale indoor wireless networks

In real-world scenarios, WSN become an integral part of IoT and is placed in a sensor domain to observe the physical environmental characteristics. In recent years, the superior portion of the researchers was drawn remarkable passion for WSN due to its minimum effort and low preparation capacity. It has several application areas like inspecting natural aspects and real phenomenon such as environmental monitoring, temperature, patient social insurance checking, submerged acoustic observance, and activity control monitoring. It has several designing challenges which affect the framework and implementation of common model, for instance, communication, time synchronization, energy, cost, system security, and nature of administration. Several studies are established to resolve these problems however localization remains a crucial issue in WSN. For instance, in a common scheme, when an unpredicted natural disaster occurs, sensors are deployed by airplane stochastically. These sensors could not find out their present location and installation of GPS to every sensor node is costly.

The sensors with the GPS are termed as anchor nodes which transfer beacon signal to compute location of unknown nodes, resulting in more energy. The location of the unknown node is calculated by employing the distance among anchor nodes (by identified position) and unknown node (by unknown position).

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Influence of process parameters on thermal characteristics of char from co-pyrolysis of eucalyptus biomass and polystyrene: Its prospects as a solid fuel

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ABSTRACT

The prospects of chars derived from the co-pyrolysis of waste polystyrene (WPS) and eucalyptus biomass at variable temperatures (300–550 °C), residence times (90–150 min) and proportions of WPS (w/w) (33% and 25%) for their potential use as a solid fuel were assessed. The production of char suggested an improved fuel quality compared to the raw feedstock because of reduced volatile and oxygen contents, along with an increase in the carbon and fixed carbon contents. While the properties of the char such as energy density (1.12–1.30), high heat value (28.03–32.5 MJ/kg) had their maximum values observed with 33% WPS content at 300 °C, fixed carbon (4.5–34.19%), fuel ratio (0.05–0.64) were maximum with 25% WPS content at 550 °C. Moreover, the energy yield of the char was higher than the mass yield. The chars produced at 300, 350 °C were observed to have O/C and H/C ratios similar to that of sub-bituminous and bituminous coal. Principal component analysis presented the variable effects of WPS on the properties of the char through physical inhibition and synergistic interactions below and above the complete volatilization temperature of WPS.

1. Introduction

Rapid industrialization and enormous population growth have resulted in a tremendous increase in energy demand and municipal solid waste (MSW) generation all over the world. The world's reliance on petroleum products remains adamantly high. International energy agency reports that petrochemicals are set to account for nearly one third and half of the growth in oil demand by 2030 and 2050, respectively [1]. The present pace of transition from fossil fuels to renewables has not been able to keep up with these accelerating energy demands [2]. On the other hand, appeal for energy demand and worries over worldwide climate change together has stood out for utilization of waste as an energy producer [3,4]. Researches focusing on the improvements in sustainable and clean energy sources that can substitute petroleum products have been resuscitated lately.

Biofuels are often termed as one of the viable near-term renewable alternatives to fossil-based fuels [5]. Especially, lignocellulosic feedstocks are viewed as the future of renewable liquid fuels because of their abundance and high yields per unit of the land area [6]. To meet the incessant increment in energy demands, fast-growing and short turn species plantations such as Eucalyptus could be the essential part of the solution. Eucalyptus plantations (lignocellulosic biomass) can be found in over 90 countries across five continents, making it the world's fastest-growing hardwood forestry sector, with a total plantation area of between 16 and 19 million hectares (40–47 million acres) [7]. With over 70% of three million hectares agro/farm forestry plantations, India stands only next to Brazil among the countries that raise large quantity of Eucalyptus biomass [8]. Unlike direct combustion, conversion of this lignocellulosic feedstock to high energy dense products may be an environmentally and economically sustainable use of this resource. The thermochemical conversion of biomass has been an

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Effect of Tool Rotational Speed on the Microstructure and Associated Mechanical Properties of Incrementally Formed Commercially Pure Titanium

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Single-point incremental forming (SPIF) was conducted on a 1-mm-thick commercially pure titanium grade 2 (Ti-G2) sheet metal in a CNC vertical milling unit. A hardened steel ball of 12 mm diameter was used as forming tool. Frustum cups were formed with varying spindle speeds between 300, 450, and 600 RPM. Other process parameters including the vertical step down and feed rate were kept as 0.2 mm and 300 mm/min, respectively. The metallurgical and mechanical properties of the formed material were investigated by cutting samples from the frustum cup walls. Electron-backscattered diffraction (EBSD) investigation revealed limited change in grain size with an increase in spindle speed. Dislocation density was measured by x-ray diffraction peak broadening analysis. The results indicate that an increase in spindle speed resulted in an increased dislocation density. The EBSD-based textural studies revealed a strong basal texture with near P and B type orientations visible at the maximum spindle speed. The tensile tests demonstrated a proportional increase in tensile strength with an increase in spindle speed along with a significant reduction in total ductility. The enhanced dislocation density and the formation of a strong basal texture were considered as the main drivers for the improvement in the tensile strength. A maximum tensile strength of nearly 550 MPa was obtained for samples extracted from the walls of the frustum cup at the maximum spindle speed of 600 RPM. This translates to an 80% enhancement of the tensile strength when compared to the base metal.

Keywords electron-backscattered diffraction, mechanical properties, microstructure, single-point incremental forming, titanium, tensile testing

1. Introduction

The titanium grade 2 (Ti-G2) is considered as the workhorse of the chemical and piping industry where superior chemical resistance, excellent strength-to-weight ratio, good weldability, and good formability are required (Ref 1). Its uses include tubing or piping systems, gas and oil storage and delivery systems, pressure vessels, chemical reaction vessels, heat exchangers, liners and various other industrial applications (Ref 2). These applications may involve various forming operations. Ti and its alloys are successfully employed in these applications with achievable tolerance levels comparable to stainless steels. However, the tolerance achieved is inferior to that of steels. Ti-G2 (commercially pure grade) is mostly used for cold forming operations (Ref 3). The commercial pure grade of Ti exhibits typically hexagonal closed pack (HCP) crystal structures at low temperature and a body-centered cubic (BCC) crystal structure at elevated temperatures (above 800°C). Typically, the deformation of Ti occurs due to a twining-based mechanism and exhibits a different stress–strain behavior in tension and compression (strength differential effect) (Ref 4). Ti alloys are sensitive to strain rate and better formability is achieved when it is formed at low strain rates at ambient temperature. Efforts have been made by several researchers to understand the forming behavior of Ti and its alloys through the conventional punch stretch test (Ref 4-6) as well as through various incremental forming techniques (Ref 7-9). Unlike the conventional punch stretch test, the single-point incremental forming (SPIF) test utilizes a point contact on the sheet metal surface and incrementally conveys the desired shape on it. This necessitates specialized computer numerical control (CNC) forming equipment. SPIF does not require a conventional punch and die setup and only a relatively simple fixture support (Ref 10, 11). SPIF has been demonstrated to attain higher forming limits than any other conventional sheet metal forming processes. To capitalize on this potential elevated formability, it is essential to investigate how the process parameters affect the success of the forming process. The most significant process parameters in SPIF are sheet metal thickness, tool diameter, tool shape, vertical step down, spindle speed, and lubrication (Ref 12). The literature reports that formability may be increased with an increase in sheet metal thickness during SPIF (Ref 13, 14). Subsequent papers suggest an optimized sheet metal thickness resulting in improved formability (Ref 15). In line with the above, an increase in tool diameter (Ref 16-18) and an increase in spindle speed (Ref 16, 19) was also

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Article

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Computation of passive suspension parameters for improvement of vehicle ride quality based on stochastic optimal controller with a look-ahead preview

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Abstract

This article aims to determine the optimum parameters of a half-car model passive suspension vehicle passing on a random road. The optimum parameters are obtained based on the response of linear quadratic regulator control with a look-ahead preview for attaining the passive suspension performance nearly equivalent to the active suspension performance. The optimum parameters are estimated by equalizing mean square suspension controlling forces of passive and active vehicle models and subsequently minimizing the performance error between the two systems. The response of passive suspension with optimized parameters matches approximately with the active suspension response, with respect to ride comfort and road holding.

Keywords

Ride comfort, passive suspension parameters, half car, linear quadratic regulator, preview control, optimization

Introduction

The dynamic behavior of the classical suspension system mainly depends on the spring and damper elements. The suspension system tries to suppress the effects of the uneven road disturbance on the output variables such as vehicle body acceleration, suspension space, and tire deflection. Passive suspension systems are not supported by any external energy source for any change in the stiffness and damping properties of the system, and in general, they are invariable. Because of the contradicting requirements and the fact that the vehicle has to operate in an extensive range of driving conditions, the choice of fixed stiffness and damping parameters must be compromised.[1] Because of the vast range of control forces in active systems, they may have better control over the vehicle dynamics and can give the best performance. However, this is paid in terms of very high energy requirements and in terms of system stability.[2] The main limitations of active systems are the difficulty in running control equipment, delay reaction, high costs, and comparatively less robust. In view of improving suspension performance, many researchers have been working on different control strategies.[3–5]

In fact, the introduction of energy into the active system can lead to unstable behavior if not properly controlled. Vehicles which require high performance need active controls, but this might be possible with high actuator power. It broadly identifies the fact that the active controls have constricted usage in general vehicles.[6] The passive suspensions are still used in most current production vehicles due to their low cost, reliability, and simplicity. Hence, stiffness of the suspension spring and coefficient of the damper are the two important design parameters, which should be selected properly for the passive suspension system.

Many researchers have been addressing the problem in view of improving the ride comfort and handling ability. Gobi and Mastinu[7] derived analytical formulae for describing the vehicle response to random excitation of road profile. They analyzed the parameter sensitivity with respect to different performance criteria. Using simplified vehicle models for optimization, the unwanted effects of the noise related to gradient information were reduced.[8–9]

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Full Length Article

γ-Fe_2O_3 nanoflowers as efficient magnetic hyperthermia and photothermal agent

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ABSTRACT

Recent reports on the magnetic nanoparticles (MNPs) as an efficient and alternative photothermal agent have excited the researchers worldwide. While MNPs have been explored well for high heating performance during magnetic hyperthermia (MHT), their full potential is yet to be explored as an efficient photothermal agent. In addition, the simultaneous exposure of alternating magnetic field (for MHT) and near infrared irradiation (for photothermal therapy PTT) can drastically enhance the heating behaviour of MNPs. In the present work we explored microwave assisted polyol method to get γ-Fe_2O_3 nanoflowers. The use of sodium acetate in varying amounts, as an alkali source, allowed the modification of structural and magnetic properties leading to the formation of nanoflower with high heating performance during MHT and PTT. Role of defects in γ-Fe_2O_3 nanoflowers were investigated using photoluminescence spectroscopy which highlighted distinct role of oxygen vacancies and surface states. The nanoflowers with better crystallinity and relatively higher coercive field performed well during MHT. The observed high intrinsic loss power value of 15.21 ± 0.34 nHm^2Kg^{-}as significantly higher than the commercially available ferrofluids and previously reported values for nanoflowers. During PTT, the therapeutic temperature of 42 °C was achieved for the aqueous suspension with a concentration as low as 100 μg/mL which demonstrates the superiority of γ-Fe_2O_3 nanoflowers as an efficient PTT agent.

1. Introduction

The unconventional approaches to treat cancer via magnetic hyperthermia (MHT) or photothermal therapy (PTT) lead the foundation of localised treatment paradigm [1-4]. PTT has also been successfully employed to ablate occlusive thrombi within blood vessels and provide relief from ischemic pathology [5]. These treatment modalities are temperature based approach (~42–46 °C) to kill cancer cells specifically and rely on the ability of nanoparticles (NPs) to emit heat under the application of a distant source of energy [1-4]. The NPs based cancer therapies had proven more efficient, being controlled remotely and on-demand localised cytotoxicity, when applied alone or in conjugation with chemo- or radiotherapy [6,7].

In MHT, when exposed to high-frequency AC magnetic fields (AMF), magnetic nanoparticles (MNPs) facilitate the conversion of magnetic energy into heat and mediate localised hyperthermia that can be used for cancer therapy [8]. The ability of these MNPs to convert magnetic energy to heat depends on their size, shape, saturation magnetisation and effective magnetic anisotropy [9-14]. In addition, the amplitude and frequency of the applied AMF also influence the heating behaviour of MNPs [8]. With the enriched understanding of factors influencing the heat dissipation behaviour, researchers were able to synthesise MNPs having specific size, shape or structure with high specific loss power (SLP) (parameter to define heating efficiency of MNPs) [10-12,14-16].

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Energy Efficient Neuro-Fuzzy Cluster based Topology Construction with Metaheuristic Route Planning Algorithm for Unmanned Aerial Vehicles

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ARTICLE INFO

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Energy efficiency
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ABSTRACT

At present times, unmanned aerial vehicles (UAVs) received significant attention among several application areas and services in both defense and civilian domains. The existence of many UAVs performs difficult process effectually when they are arranged in an adhoc way. The restricted battery capacity of the UAVs, rapid mobility, and high dynamic nature of the UAVs necessities the design of energy efficient clustering and routing protocols. With its motivation, this paper develops an Energy Efficient Neuro-Fuzzy Cluster based Topology Construction with Metaheuristic Route Planning (EENFC-MRP) algorithm for UAVs. The presented model involves EENFC based clustering and MRP based routing processes. The EENFC model make use of three input parameters namely Residual Energy in UAV, Average Distance to Nearby UAVs, and UAV Degree for the cluster construction. In addition, Quantum Ant Lion Optimization (QALO) based MRP is applied to choose an optimal set of routes for intercluster UAV communication. In order to investigate the energy efficient outcome of the EENFC-MRP algorithm, a series of simulation processes were carried out and the results are examined under several aspects. The resultant experimental values ensured the betterment of the EENFC-MRP algorithm over the existing models interms of energy efficiency, throughput, network lifetime, and average delay.

1. Introduction

In general, the robust development of scientific models like efficient and cheaper Wi-Fi radio interface, sensor nodes (SN), Global Positioning Systems (GPSs), and in-built microcomputer based Unmanned Aerial Vehicle (UAV) are employed widely in different sectors like health care, armed forces, civilian applications and so on. For instance, public safety and disaster management process [1], monitoring and reconnaissance, border inspection, independent observation, forest fire management, rescue operation, people safety, homeland integrity, climate monitoring, remote sensing, traffic observation, as well as relay for ad hoc networks. Additionally, massive number of commercial domains like filmmaking, agriculture, Internet delivery, goods exchange, and architecture monitoring [2]. For sample, Nokia has introduced ultra mini 4G Base Station (BS) with the weight of 2 kg, bounded by commercial quad-copter; so that provide the remote area in Scotland is covered completely. Furthermore, Amazon has developed a drone named Amazon Prime Air for the purpose of delivering packages to the respective users with limited time intervals with the help of minimum drone. The establishment of maximum drones tends to invoke some challenging issues [3–5].

With respect to cooperation and collaboration among several UAVs, inter-UAV data transmission is highly recommended for developing UAV system or called as Flying Ad Hoc Networks (FANETs). Also, the UAVs are referred as drones, and 3 terminologies like UAV system, FANET, and drone ad hoc network are applied alternatively [6,7]. The architecture of UAV system is as depicted in Fig. 1. For single UAV system, the UAV is connected to a base station (BS) whereas, in multi-UAV system, numerous UAVs are linked with one another and also

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Analysis on Dual Supply Inventory Model having Negative Arrivals and Finite Life Time Inventory

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Abstract

In this paper the impact of dual supply chain on a perishable inventory model with negative arrivals is evaluated. The perishable and replenishment rates of dual suppliers are distributed exponentially. Arrival process follows Poisson distribution and the probability for an ordinary customer is p and for the negative customer is q. Limiting distribution of the assumed model is obtained. Numerical results are presented for cost function and various system performance parameters. The impact of dual suppliers on the optimal reorder points will be useful in developing strategies for handling various perishable inventory problems with replenishment rates.

Keywords: Matrix analytic method, Steady state distributions, Perishable inventory, Replenishment time, Negative arrivals, Dual supply inventory model, Cost function optimization.

I. Introduction

In an (s, S) inventory policy, an order of quantity $Q(= S - s)$ is placed if inventory drops to s, so that the maximum inventory level is S. This policy has been widely discussed for almost a century. However in inventory models with more than one supplier we can improve the quality of service, develop strong relationship with the customers, reduce loss of sales due to stock shortages, enhanced profits, etc. In dual supply (s, S) inventory policy, two orders of quantities Q_1 and Q_2 are placed whenever inventory level drops to r and s respectively. For literature on inventory models with dual supply chains one can refer [9] and [8].

A review of the literature on fixed time perishable inventory models was given by the life time of inventory items is indefinitely long in many classic inventory models, like vegetables, food items, medical products, etc., which become unusable after a certain span. That means there exists a real - life inventory system which consists of products having a finite lifetime. These types of products are called as perishable products and the corresponding inventory system can be considered as a perishable inventory system. [10] studied inventory models for perishable items with and without backlogging. A deterministic inventory model for perishable items with time dependent arrivals is developed by [5]. [1] discussed a perishable inventory model with style goals.

Finite waiting hall inventory model with negraive arrivals is introduced by [4]. For more literature on negative arrivals, one may refer [2],[3] and [6, 7].

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ORIGINAL ARTICLE

Design of Training Sequences for Multi User—MIMO with Accurate Channel Estimation Considering Channel Reliability Under Perfect Channel State Information Using Cuckoo Optimization

Uma Maheswari Ramisetty[1] · Sumanth Kumar Chennupati[2] · Venkata Nagesh Kumar Gundavarapu[3]

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Abstract

Designing the time domain training sequences is very critical in multi carrier transmission which degrades the performance as it is contaminated by different blocks in different cells. To improve the spectral efficiency and high accuracy, MU-MIMO needs the sensing matrix to be reduced by using the training sequence design and optimization. Integrating the training sequence design and sparse channel estimation improves the capacity of the system. The capacity can be enhanced by reducing the bit error rate. The system capacity for multi user- multi-input and multi output (MU-MIMO) is studied by proper channel estimation with compressed sensing model. The design and optimization of training sequence is analysed for MU-MIMO model using auto coherence and block coherence matrices. The block coherence matrix is optimized using cuckoo algorithm for obtaining lower coherence value for different sparsity values. The performance improvement in terms of signal to noise ratio is 1 dB for single user- multi-input and multi output (SU-MIMO) using genetic algorithm and the performance of MU-MIMO is observed to be 0.93 dB using cuckoo algorithm.

Keywords MIMO · Muti-user · Channel state estimation · Training sequence · Precoder · Channel estimation

List of Symbols

h_l	Channel vector of l_{th} user
$\tilde{h}_l$	Channel matrix
$\tilde{h}_{lbest}$	Lowest coherence Value of block coherence matrix
K	Number of Users
M	Number of Base station antennas
p	Degree of perfection
R_l	Hermitian Matrix
R_{sum}	Achievable Sum rate
s_n	Transmitted Symbol
V	Rician factor
W	Weight factor
w_l	Optimal beam forming Vector
w_n	Normalized vector
ε	Channel reliability
ε_c	Critical reliability
φg	Sensing Matrix
$\mu_B(\varphi)$	Block coherence matrix
$\mu_B(\varphi_\alpha, \varphi_\beta)$	Lower bound of Block coherence Matrix
θ_l	Angle of departure
σ^2	Variance

Abbreviations

BER	Bit error rate
MU-MIMO	Multi User Multi input and multi output
SINR	Signal to interference plus noise ratio
SLNR	Signal to leakage noise ratio
ZF	Zero Forcing
MRT	Maximum ratio transmission
SISO	Single input single output
LOS	Line of sight
IDFT	Inverse discrete Fourier transform
SVD	Single value Decomposition
CSI	Channel state Information
IDFT	Inverse discrete Fourier Transform

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Performance Analysis of Multi User Mimo System With Successive Hybrid Information and Energy Transfer Beamformer

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Abstract

The current proliferation of communication networks such as MU-MIMO necessitates high throughput coupled with high data rates. For maximization of harvested power the power received must be increased. However, this causes an increase in interference adversely affecting the sum rate. It is imperative to work out the trade-off between energy harvesting and spectral efficiency which is directly related to the sum rate. This paper proposes the logic of optimization by the weighted coefficient method using successive hybrid information and energy transfer (SHIET) so that a trade-off can be achieved. As the multi-objective optimization seems to be more difficult, this is modified to a single-objective optimization using weight factor method. This method calculates channel state information (CSI) from the angle of perfectness which directly gives the sum rate. Further harvested power is calculated from achievable sum rate and truth value is determined by various weight coefficient factors. Simulation is carried out on MU-MIMO system for ascertaining the effectiveness of the proposed method for achieving an optimized trade-off between energy harvesting and spectral efficiency. The performance of trade-off is better with linear beamformers that employs ZF and MRT with a smaller number of information users, whereas the performance of SHIET outperforms when compared to the linear beamformers irrespective of any number of information users.

1 Introduction

The rapid growth in mobile traffic demands heterogeneous wireless networks. Every device needs high throughput and high speeds in various applications like video streaming, gaming and voice etc. To design wireless system three parameters are to be considered such as energy consumption, simultaneously serving many users and high throughput [1].The

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FOCUS

An intelligent energy management and traffic predictive model for autonomous vehicle systems

Suneetha Manne[1] · E. Laxmi Lydia[2] · Irina V. Pustokhina[3] · Denis A. Pustokhin[4] · Velmurugan Subbiah Parvathy[5] · K. Shankar[6]

Abstract
In recent times, the utilization of autonomous vehicles (AVs) has been significantly increased over the globe. It is because of the tremendous rise in familiarity and the usage of artificial intelligence approaches in distinct application areas. Though AVs offer several benefits like congestion control, accident prevention, and so on, energy management and traffic flow prediction (TFP) remain a challenging issue. This paper concentrates on the design of intelligent energy management and TFP (IEMTFP) technique for AVs using multi-objective reinforced whale optimization algorithm (RWOA) and deep learning (DL). The proposed model involves an energy management module using fuzzy logic system to reach the specified engine torque with respect to different measures. For optimal tuning of the variables involved in the fuzzy logic membership functions (MFs), RWOA is employed to further reduce the energy utilization. Besides, the proposed model uses a DL-based bidirectional long short-term memory (Bi-LSTM) technique to perform TFP. For validating the efficacy of the IEMTFP technique, an extensive experimental validation is carried out. The resultant values ensured the goodness of the IEMTFP model in terms of energy management and TFP.

Keywords Autonomous vehicles · Intelligent systems · Deep learning · Energy management · Traffic flow prediction

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Research Article

Exhaust Emission Characteristics of a Three-Wheeler Auto Diesel Engine Fueled with Pongamia, Mahua and Jatropha Biodiesels

Author(s): Bobbili Prasadarao, Aditya Kolakoti* and Pudi Sekhar

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Abstract

Background: In India, three-wheeler auto diesel engines are also known as autorickshaw, play a vital role in day to day transportation. On the other hand, it pumps huge amount of harmful exhaust emissions into the atmosphere. As per the study by European Union 1% of India's over two billion tonnes of annual vehicular CO2 emissions are from autorickshaws.

Objective: To address the issue of high exhaust emissions from diesel engine, this paper has proposed Pongamia (PME), Mahua (PME) and Jatropha (JME) biodiesels as an alternative fuel.

Methods: Biodiesel is produced by transesterification process; exhaust emissions analysis is carried out on a single cylinder four stroke three-wheeler auto diesel engine at constant speed of 1500rpm. Diesel as a reference fuel and cent percent of PME, MME, and JME as an alternative fuel.

Results: Exhaust emissions reveals that there is a maximum reduction of Unburnt Hydrocarbons (UHC), Carbon Monoxide (CO), NOx, Carbon Dioxide (CO2), and smoke compared to diesel fuel. At maximum load the NOx emission reduced by 18.41% for JME, 17.46% for MME and 7.61% for PME. Low levels of CO emissions are recorded for JME (66%) followed by MME (33%) and PME (22%). UHC were reduced by 85.75% for JME, MME and for PME 14.28% reduction is observed. Smoke emissions are also reduced for PME and MME by 18.84%, for JME 14.49%.

Conclusion: It is observed that all the methyl esters exhibit significant reduction in harmful exhaust emissions compared to diesel fuel and jatropha biodiesel is noted as a better choice.

Keywords: Bharat stage emission norms, biofuel, exhaust emissions, Million Tonnes (MT), Carbon Monoxide (CO), Indirect Injection (IDI).

Graphical Abstract

Segmentation of Natural Images With K-Means and Hierarchical Algorithm Based on Mixture of Pearson Distributions

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Abstract. Image analysis and retrieval are most important for video processing, remote sensing, computer vision and security and surveillance. In an image, regional variation is more important for authentication and identification. Nowadays, the model based segmentation methods are more prominent and provide accurate results for segmentation of images. For ascribing a suitable model it is reasonable to consider the probability model, which closely matches with the physical features of the image region. In this paper a new and novel approach of image segmentation is carried using the Type III Pearsonian system of distributions. In the current work, it is considered that the entire picture is characterized by a K-component combination of Pearsonian Type III distribution. Using the EM algorithm, the performance parameters for the currently considered model are estimated. Through experimentation 4 real images randomly selected from the Berkeley image database. The computed values of PRI, GCE and VOI revealed that proposed method provide more accurate results to the same images in which the image regions are left skewed and having long upper tiles. Through image quality metrics the performance of image retrieval with the proposed method is also studied and found that this method outperforms then that of the segmentation method based on GMM. The results of the current model is being compared with the other existing previous models like the 3-paprameter regression models and the k-means hierarchical clustering models for various sets of input images and the results are displayed in the performance evaluation models chapter in detail.

Keywords: EM-Algorithm, Type III Pearsonian Distribution, Image segmentation, image quality metrics.

1. Introduction

Several methods are available to analyze and develop the image models and their structures by using various methods. Segmentation of images is also another important method used for the same processes [Srinivas Y. et. Al., Pal N.R., et. Al., Sela Lim et. Al.,]. In general, several methods are available in literature also to use these sorts of tasks. The important model of the method was the usage of a mixture of Pearson Type I distribution with the combination of hierarchical algorithms or K-means clustering algorithms. These methods are highly used in some situations like if the

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Research article

Long term prediction of rainfall in Andhra Pradesh with Deep learning

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ABSTRACT

Rainfall is the major concern for almost types of people in the society. It helps different types of people in the society in different means. For some people, it's the source of providing drinking water. For others like farmers, it's the source of their livelihood and for all other human beings too. As farmers grow the farm and rice will be produced for the human being to eat. As a whole, the rainfall plays a key role for almost all kinds of people living in the society. Prediction of this rainfall is always an interesting and useful news for any kind of people in the society. Especially for the government agencies, it's a very useful source as based on predictions, the harvesting and storing of water could be prepared well in advance. It also plays a key role in the production of power or generation power with the help of water flow in dams and reservoirs. In the article, an attempt has been made to build a system that takes input of previous years rainfall data from dataset which was collected from the Meteorology department of Andhra Pradesh and predict the average amount of rainfall of upcoming months in a specific year. We have initially separated the available data into training and testing data sets and made a model. We had applied various statistical and machine learning approaches like the linear model, Support Vector Machine algorithms etc. in predicting the results, along with a Neural Network model and made analysis over various approaches and compared their results with actual data. By these various approaches, the error of prediction was minimized and increased the accuracy of results predicted by the model.

Keywords: Linear Regression, Support Vector Machine, Artificial neural network, rainfall forecasting, model selection.

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INTRODUCTION

Agriculture is the backbone of the India's work and economy [(1)]. Most of the people who lives in rural India depends on the agriculture or agriculture was their main work and source of livelihood. The country depends mostly on agriculture and its related products development and usage. The provision of irrigation was getting developed slowly and it had become little faster than the previous decades. The sufficient number of irrigation projects are still not constructed or not available [(2)] farmers in the country. As a result, most of the water from rains will be passes to the sea and most of the water from rainfall could be used for agriculture and related sources. The prediction of rainfall is also one of the most important Factors here to make the necessary arrangements for storing such rain water for both irrigation and for drinking water too. The saying a good and better [(3)] rainfall may give good storage of water for drinking and for agriculture too in the country.

The necessary of predicting the rainfall was very [(4)] serious due to several reasons. For a country like India where every few water storage capacities are available and most of the rural India depends on rain for drinking water. The information related to rainfall is always a good and interesting news for almost all types of people living in rural India. The economy and employment for rural India mostly depends on agriculture where they will produce most of the food and related crops to make feed to the other societies in the country. Hence, the prediction of rainfall is always a good work we felt and very few works were available in providing such information. The productivity [(5)] of the

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Research article

Comprehensive analysis on comparison of machine learning and deep learning applications on cardiac arrest

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ABSTRACT

Machine Learning is the technology of having machines to understand and behave as humans do. Refining their learning in supervised manner over time, by feeding them information and data in the form of experiences in the real world. Heart disease has a wide variety of consequences, varying from asymptomatically to extreme arrhythmias, and even premature cardiac failure. A comparative computational analysis was conducted on open-source datasets among the most frequently used classification algorithms in Machine Learning and Neural Networks by randomly splitting data in to test and training and in-depth survey of feature selection is addressed. Our study further concentrates on working with massive datasets from prospective study.

Keywords: Cardio Vascular Diseases, SVM, k-means, Machine learning, Neural Networks.

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INTRODUCTION

Cardiovascular disease and Cardiac arrests head the list of Significant [(1)] Concern. They are known globally as a leading cause of death. Most of the Cardio vascular disease regarded as the primary factor in mortality rate among men and Women of all ages and genders. As Heart disease is a non-communicable risk condition includes CAD history of age, ethnicity, age and family, while modifiable risk indicators involve elevated Blood pressure [(2)], Blood cholesterol, Blood triglyceride, diabetes, drug consumption, opium usage and smoking. Changing the lifestyle will control responsive risk factors to some extent. According to estimates from the World Health Organization, count of cardiac arrests contributed to about 17.9 million deaths in 2016 [(3)]. The study of cardiovascular diseases and tracing the symptoms in prior helps to build a good recommendation system for Doctors and Research. As, it is a concern of taking a wise decision with mere response of time is accounted for saving the lives of a patient.

The doctors then require good instructions on when to expect a heart attack, how to assess it, and how to act after a diagnosis is made. In addition, the guidelines will be focused on data gathered from the community of interest representing local patterns [(4)] of local practice. The present studies analyze the predictions using retrospective study. i.e., learning from available and previous health records [(5)]. Doctors not only require specific instructions on when to perform an ECG and when to refer a patient, they need to consider the risk of early intervention mortality as well as the medical-implications of this situation. Machine Learning has become wide spread and a primary tool for promoting clinical study and practice on extracting Electronic Health Records (EHRs) [(6)]. In Comparison to supervised learning, unsupervised machine learning has shown ability to classify novel patterns and associations from EHRs without the need for human generated Labels. Nevertheless, the huge and unprecedented amounts of historic record and the constant streaming of data [(7)] produced in

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Regular paper

Analysis of SWIPT based dual-hop AF relay with SSK modulation over Nakagami-*m* fading channel

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ABSTRACT

Space shift keying (SSK) modulation performance is analyzed with simultaneous wireless information and power transfer (SWIPT) based cooperative amplify-and-forward (AF) relaying system over the Nakagami-*m* fading channel. SWIPT technique can remove the need for power supply at the relays in cooperative communication. In contrast, SSK is a low complex index modulation technique that eliminates inter antenna synchronization, inter-channel interference and reduces the number of radiofrequency chains. Closed-form expression for average bit error probability (ABEP) is derived using a single AF relay with selection combining (SC) at the receiver, and an Upper bound ABEP expression is derived for multiple AF relays with the direct link (DL) from source to destination. The partial relay selection (PRS) technique has been proposed with energy harvesting (EH) to reduce the hardware complexity compared to the multiple relays. Numerical and computer simulation results are presented with the discussion. The result demonstrates that EH with SSK modulation can improve the system performance.

1. Introduction

The tremendous demand for new technologies like the Internet of Things (IoT) along with machine-to-machine (M2M) communication forces wireless technology for the evolution in the near future [1]. These new technologies promise to improve our lives by providing a better quality of services like remote health care, transportation, and surveillance. These requirements can be fulfilled due to the higher data rates and better network coverage [2]. In addition to the needs, energy efficiency maximization is one of the most difficult challenges for the fifth generation (5G) of wireless networks. Energy harvesting (EH) for 5G communication is a promising solution for prolonging the lifetime of the energy constraint nodes by allowing the battery to recharge in some impossible circumstances like structural health monitoring, chemical environment, military condition, mine tunnels, etc [4]. From reliable energy sources like radio frequency (RF), wind, and solar signals, the energy can be harvested. Simultaneous wireless information and power transfer (SWIPT) is a recent technology based on RF signals EH, where the RF signal can carry both energy and information simultaneously [5]. However, Space shift keying (SSK) is a low transmission complexity modulation scheme with a high data rate. SSK is a special case of spatial modulation (SM) where the information is transmitted by activating a single antenna out of N_t transmitting antennas. AS a result of this, the problem associated with multiple-input-multiple-output (MIMO) communication such as inter antenna synchronization, inter-channel interference can be avoided, and the number of RF chains can be reduced [6]. In SSK modulation, transmission and detection are simplified as the antenna index is mapped into data bits during the transmission. In this modulation scheme, out of multiple transmitting antennas, only one antenna is activated at a time to send the information.

Motivation: Cooperative communication provides a notable improvement in wireless coverage and system capacity. However, SSK modulation is more convenient for cooperative communication. R. Mesleh et al. in [7] investigated the bit error rate performance of SSK modulation with amplify-and-forward (AF) over Rayleigh fading channel by considering two transmitting antenna and one receiving antenna. The same authors in [8] considered the multiple numbers of relays for better average bit error probability (ABEP) performance. For the first time, M. Wen et al. in [14] proposed two-way AF relaying with SSK modulation over Nakagami-*m* fading channel. The performance of decode and forward (DF) is investigated in [15] for multihop MIMO network. Similarly, recently in [16] the authors proposed both symmetrical and asymmetrical fading channels on dual-hop AF relay with

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Performance Analysis of Energy Harvesting based Smart Grid Dynamic HAN with SSK Modulation

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***Abstract*—This letter analyzes the performance of a dynamic home area network (HAN) for smart grid communication using space shift keying modulation and energy harvesting. HAN plays a vital role in communication between home appliances and smart meters. The network considered here is with the multiple numbers of transmitting antennas at each home appliance and a single receiving antenna at the smart meter, which operates under the Saleh-Valenzuela channel. The average bit error probability performance of the indoor HAN with wireless power communication is derived in closed form by implementing the multi-user selection combining method. The numerical results and simulation results are presented to illustrate the impact of energy harvesting on system performance.**

***Index Terms*—Home area network, Smart Grid, Wireless powered communication network, Space shift keying, Average bit error probability, S-V Channel.**

I. Introduction

Smart grid (SG) integrates electrical grid and communication infrastructure to improve reliability and efficiency [1]. The communication infrastructure of the SG is characterized into three types i.e., home area network (HAN), wide area network (WAN), and neighborhood area network (NAN). This classification of SG communication is based on coverage area and speed of communication technology [2]. In HAN, a smart meter (SM) is used to monitor and control all the home appliances (HAs) and smart devices of the customer. However, as the number of HAs in HAN increases, the demand for energy harvesting (EH) has triggered for uninterrupted power supply [3]. Moreover, frequent replacement of the battery is not possible in the HAs due to the real-time remote monitoring of the SG equipment. Thus, to enhance the battery life, radiofrequency EH turns up as an ingenious and beneficial technique for powering network nodes in different scenarios.

Wireless powered communication network (WPCN) technology eliminates the replacement of battery requirements that can efficiently reduce the operational cost and enhance communication performance [4]. Hence the energy-constrained SM can harvest energy from the RF signal and sends the enrgy to HAs. To achieve efficient energy transfer, wireless power transfer (WPT) needs highly directional antennas to focus the energy in a narrow beam towards the energy receivers [5]. Similarly, to maximize the received signal power level, the energy transmitter needs the knowledge of channel state information of the information transmitter. While EH is supported by WPCN, space shift keying (SSK) modulation is a less complexity based high data rate transmission used for short-distance communication between HAs and SM. In SSK modulation, only a single antenna is activated out of N_t transmitting antennas, for a given time instant to send the data. Here, the process of transmission and detection is very simplified as the antenna index is mapping into data bits during the communication [8]. These benefits of SSK modulation associated with WPCN technology can be a suitable candidate for upgraded data transmission with energy reliable networks in future SG communication.

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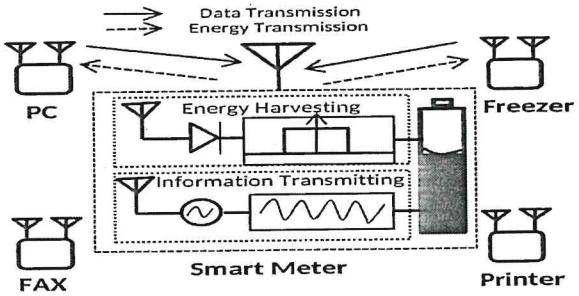

Fig. 1: Communication of dynamic HAN in smart grid

The performance analysis of HAN is investigated in [1] for outage probability and bit error rate by employing multi-user selection combining. In [2], the authors derived mathematical expression for average symbol error rate and average channel capacity with rectangular quadrature amplitude modulation and Gaussian minimum shift keying modulation schemes over SG communication. Similarly, in [3], the authors have explored the asymptotic reporting probability and reliability performance in remote relay nodes aided smart metering networks. In [9], the authors have investigated the multi-user WPCN technology where the users don't have any external energy source to transmit the information. However, the implementation of the EH network with space modulation is very limited. In [10], SSK modulation is investigated with WPCN and a closed-form expression of bit-error-rate expression is derived. Similarly, SSK modulation is explored with simultaneous wireless information and power transfer (SWIPT) over Rayleigh fading in [11]. Recently, in [12], the authors considered WPCN for smart city applications using SSK-binary phase shift keying modulation. However, the concept of SSK modulation with WPCN in the context of SG communication is an open challenge, and to the best of the author's knowledge, it has not been explored.

In this letter, the average bit-error-rate (ABEP) performance of the SG communication is investigated with nonlinear EH model at SM over Saleh-Valenzuela (S-V) channel model.

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Adaptive hysteresis band current control of grid connected PV inverter

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ABSTRACT

In this paper, adaptive hysteresis band current controller is implemented to control the current injected into the grid. Initially it was implemented by B.K Bose for control of the machine drive. Now it is implemented for the grid connected PV inverter, to control the current injected into Grid. It is well suitable for the distribution generation. The adaptive hysteresis band controller changes the bandwidth based on the modulating frequency, supply voltage, input DC voltage and slope of the reference current. Consequently, the controller generates pulses to the inverter. It is advantageous over the conventional hysteresis controller, as the switching frequency is maintained almost constant. Thereby quality of grid current is also improved. It is verified in time domain analysis of simulation using MATLAB.

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1. INTRODUCTION

Due to the development of power electronic devise in power system generates the harmonics in voltage as well as current power high frequency which effect the performance of the loads. These are crucial role in power quality issues. There was a technical improvements are there in HVDC and FCTS device to reduce the generation of harmonics [1]. The VSC based converter are used in medium and low level power transmission for high level power SCR based HVDC system is used [2-5]. HVDC DC light is made of fully controlled switch such as IGBT or MOSFET along with PWM technique. It reduces the hormonic generation, minimizes the filter requirements [6, 7]. The HVDC system is a highly efficient alternative for transmitting large amounts of electricity over long distances and for special purpose applications. As a key enabler in the future energy system based on renewables, HVDC is truly shaping the grid of the future [8]. This hierarchical control structure is discussed which is important tool to maintain the dynamics, stationery performance of the micro grid with respective economical aspects [9]. Different control schemes are discussed in DC micro-Grid to mitigate the issues in it with the goal of providing control design guild lines [10, 11]. The high bandwidth hierarchical control structure for AC micro grid in distribution level. Conventionally to control Grid voltage and frequency were done by hierarchical linear control loops. they suffer from slow response with parametric effects. So the model predictive control technique is used to realize with heigh band width to control the multiple VSC. Furthermore, droop control and virtual impedance methods were employed to share active and reactive power. Based on a large-signal dynamic model of a micro grid, a linear parameter varying based state estimator that is localized in each distributed generation (DG) unit serves as an alternative

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SPECIAL ISSUE ARTICLE

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Optimal deep learning based image compression technique for data transmission on industrial Internet of things applications

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Abstract

Recently, industrial Internet of things becomes more popular and it involves a group of intelligent devices linked to create systems which observe, gather, communicate, and investigate data. In this view, the demand for compression techniques in remote sensing images is increasing since low complexity technique is required in spacecraft. Deep learning, for instance, convolutional neural network (CNN) has gained more attention in the domain of computer vision, particularly for high-level applications like detection along with interpretation. At the same time, it is difficult to resolve the low-level applications like image compression and it is investigated in this article. This article presents an optimal compression technique using CNNs for remote sensing images. The proposed method uses CNN for learning the compact representation of the original image which held the structural data and was then coded by Lempel Ziv Markov chain algorithm. Next, the encoded image was reconstructed to retrieve the original image with high reconstructed image quality. The proposed optimal compression technique is compatible with the available image codec standards. Wide range of experiments was carried out and the results were compared with binary tree and optimized truncation, JPEG, and JPEG2000 in terms of compression efficiency, reconstructed image quality, and space saving (SS). The obtained results apparently proved the effectiveness of the presented method, which attains an average peak signal to noise ratio of 49.90 dB and SS of 89.38%.

1 | INTRODUCTION

Industrial Internet of things is generally defined as Internet of things (IoT) since it is employed among different kinds of industries like manufacturing (Industry 4.0), logistics, oil and gas, transportation, energy/utilities, mining and metals, aviation, and other industrial sectors. The advancements in home automation, smart environment, smart cities, and sensor networks for civilian and military applications have integrated to design IoT. With recent developments in the area of remote sensor technology, it is simple to capture higher quality remote sensing images using different satellites in addition to sensing devices and is definitely advantageous to remote sensing image applications.[1] However, the huge amount of information, that is, remote sensing images has become a great challenge for storage and transmission. So, compression techniques have become essential in processing the remote sensing images. Generally, conventional compression

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RF induction heating and *in-vitro* study of citrate functionalized Zr-substituted Fe_3O_4 nanoparticles with human lung adenocarcinoma (A549) cell

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ABSTRACT

We present a study on biocompatibility of citrate capped $Zr_xFe_{3-x}O_4$ based magnetic ferrofluids with human lung adenocarcinoma (A549) cell, evaluated by Sulforhodamine B assay. It was found to be ~86% at a concentration of 1.5 mg/mL after 48 h. **We approached** single step and cost effective polyol **methodology to get a well dispersed and homogeneous aqueous suspension of** citric acid coated $Zr_xFe_{3-x}O_4$, ($0 \leq x \leq 0.3$) **MNPs. We used citric acid which anchored over the surface of freshly prepared nanoparticles to provide stability for longer duration** . The X-ray and electron diffractions suggested the formation of single phasic magnetite particles of size 5–18 nm. The aggregation of MNPs was prevented by citric acid which was confirmed from Fourier-transform infrared spectroscopy spectra. The Zeta potential measurement inferred the well dispersion of nanoparticles at varying pH values (2–10). The Zr-substituted magnetite had relatively lower magnetization values than pure one. The optimum specific absorption rate (SAR) value at a field of 23 mT, 261 kHz was obtained to be 44 W/g for the sample $x = 0.02$ at a concentration of 10 mg/mL. In contrast, the intrinsic loss power (ILP) value was optimum (0.54 nHm^2/kg) for Fe_3O_4 ferrofluid having a concentration of 5 mg/mL and at a field of 17 mT, 170 kHz. Nevertheless, **the reported ferrofluids have displayed high heating capacity and suitable biocompatibility thus these could be used as promising materials for** bioapplications including magnetic hyperthermia.

1. Introduction

Magnetic nanoparticles (MNPs) of various types offer large possibilities of applications as biomedicine [1]. These applications could be named as biosensing, magnetic separation, medical screening and therapies, bio-assays, contrast agents for magnetic resonance imaging, magnetically addressed drug delivery, tissue repair, cell and tissue targeting, transfection and magnetic hyperthermia (MHT) treatment of cancer [2–10]. Nevertheless, such applications are possible due to the particles having size ($\leq$ 30 nm) smaller or comparable to that of biological entities e. g. cell (10–100 μm), a virus (20–450 nm), a protein (5–50 nm) or a gene (2 nm wide and 10–100 nm long) [1,11]. But the significantly high surface to volume ratio for the MNPs intends them to get clump/adsorb on the plasma proteins during *in-vivo* administration [12]. Therefore, the modification of their surface is essential to enhance their biocompatibility with the cells and prevents aggregation [13–15]. Such modifications even facilitate to get homogenous dispersion of the MNPs in carrier fluids which is popularly known as ferrofluid [16]. The organic materials like dextran, citric acid (CA), chitosan, starch, PEG, PVA, oleic acid etc. and inorganics such as SiO_2, carbon etc. are the common materials used for this purpose [5,17–22].

The MHT treatment of cancer is suggested as a highly promising and selective technique as the temperature range of 42–46 °C has lethal effect on the cancer cells whereas negligible effect on the normal cells [23]. The MNPs during MHT play vital roles as mediators which transform the magnetic losses under the application of alternating current (AC) magnetic fields in to thermal energy. The insignificant susceptibility of the body tissues does not respond to such magnetic fields and hence remains unaffected. So far physical properties of MNPs are concerned, these should have narrow size distribution and high saturation magnetization (M_S) values [24]. The latter one helps in reducing the dose of magnetic ferrofluids to attain the therapeutic temperature

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A New Ranking in Hexagonal Fuzzy number by Centroid of Centroids and Application in Fuzzy Critical Path

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Abstract

This paper intends to introduce a different ranking approach for obtaining the critical path of the fuzzy project network. In the network, each activity time duration is viewed by the fuzzy hexagonal number. This study proposes an advanced ranking approach by applying the centroid of the Hexagonal fuzzy number. The Hexagon is separated into two right angles and one polygon. By applying the right angle and polygon centroid formula, we can calculate the centroid of each plane and calculate the centroid of the centroid. It also focuses on the arithmetic operations in Hexagonal fuzzy numbers. The developed strategy has been described by a numerical illustration and is correlated with a few of the existing ranking approaches.

Keywords: Fuzzy critical path, fuzzy triangular number, ranking function, centroid, the centroid of centroid, hexagonal fuzzy number.

I. Introduction

Construction is an essential planning tool and organizes the implementation of a specific project. The network diagram plays a critical aspect in the completion period of the formative project. The Critical Path Method (CPM) is a successful approach to scheduling and controlling large management and construction projects. The Critical Path Method was developed at the beginning of the 1960s; with the support of the critical path, the decision-maker will follow an acceptable technique of maximizing the project period and the possible tools to achieve the project's earliest completion and quality.

The fuzzy set theory can always play significant role in dealing with the complexity of the activity's durations in a project network in this type of problem.

In 1965, Zadeh [8] recommended the fuzzy set concept to represent undefined terms. Jain [10, 11] recommended a ranking approach applying the notion of maximizing the fuzzy number of the order set in 1976.

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Harmonic stability analysis of multi-paralleled 3-phase PV inverters tied to grid

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ABSTRACT

In this paper the harmonic stability is investigated for multi paralleled three-phase photovoltaic inverters connected to grid. The causes to harmonically stabilize/destabilize the multi-paralleled PV inverters when tied to the grid is analysed by the impedance-based stability criterion (IBSC). In this paper stability of the system is investigated by varying the grid inductance with constant grid resistance and also by varying load impedance while maintaining grid inductance constant. Stability of the multiple three phase inverters tied to the grid with different grid impedance, inductance value in particular are analyzed. Overall system is stable up to grid inductance of 5mH even though there is change in load admittance. It is concluded that system stability depends only on grid impedance. It is verified with MATLAB Simulations.

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1. INTRODUCTION

Proliferation of renewable energy sources is the current scenario to the meet the increasing load demand. When these sources are connected to the grid there is interaction between the LCL filter, grid impedance, and inner current loop of the inverters. Thereby, it causes the harmonic instability [1], [2]. Which further leads to amplification of resonance over the range of frequencies. This sometimes leads to unwanted withdrawal of the PV inverters from the grid [3], [4]. The interaction of the admittances of multiple inverters causes two issues one is amplification of Resonance and seconed one harmonic instability. These two issues are analyzed and answered by means of IBSC analysis. IBSC was applied to design the output filter in chopper circuits [5], [6]. The conversion method for harmonic transfer function-based model for a Voltage source converter into a simple and efficient Single Input Single Output model [7]. Stability characteristics were obtained with the frequency coupling effect. In [8], Impedance model in dq-frame was developed for offshore wind power plant to study the effect of inverters and transmission cables. The analyzed the harmonic stability in modular multilevel based DC systems. It was verified with hardware experimentation as well as simulation. DC impedance model of the system was developed by considering the capacitor voltage fluctuation, harmonic responses [9].

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EC-decay of ^{133}Ba revisited by electron-gamma spectroscopy

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Abstract
Internal conversion electron and gamma-ray spectroscopy measurements were carried out on the 10.551 y ^{133}Ba electron-capture decay with our electron and gamma spectrometers—a mini-orange electron transporter paired to a Si(Li) detector and a large-volume HPGe detector, respectively. The relative and absolute gamma-ray intensities of all the nine transitions in ^{133}Cs were determined. We also report the relative conversion intensities of eighteen conversion lines and their corresponding internal conversion coefficients (ICCs), four of which are being reported for the first time. Transition intensity balance at each energy level, showed that the measured values are self-consistent. This exhaustive dataset of gamma-ray intensities, internal conversion electron intensities and the ICCs that have low uncertainty, will be highly valuable for the purposes of energy and efficiency calibration of semiconductor gamma ray detectors and electron spectrometers.

Keywords ^{133}Ba · Gamma energy E_γ · Relative gamma intensity I_γ · Conversion electron intensity I_{CE} · Conversion coefficient · Detector calibration · p_γ

Introduction

The proton-rich nucleus ^{133}Ba decaying by electron-capture, populates four excited levels in the daughter nucleus ^{133}Cs. Owing to its relatively simple decay, with nine well separated gamma rays of good emission probabilities in the 50–400 keV range, the long-lived ^{133}Ba ($t_{1/2}$ = 10.551 (11) y) is one of the widely preferred radioisotopes for detector calibration. It is extensively used as an energy and efficiency calibration standard not only for high purity germanium (HPGe) detectors, but also for conversion electron spectrometers.

Precision decay data are a must for the radioisotopes that are used as standards for calibration purposes. However, the data on the gamma-ray energies and intensities of ^{133}Ba decay reported earlier [1–7] were obtained using older detection systems that used NaI(Tl) or Ge(Li) detectors of limited resolution. A couple of high resolution gamma-ray energy measurements have been undertaken in the past—Kumahora [8] used a Ge detector with a resolution of about 0.580 keV for the 136 keV gamma-ray (^{57}Co) and refined the gamma energies of ^{133}Cs with uncertainties of just 0.6–2.7 eV. Mucciolo and Helene [9] reported precise values of gamma-ray energies using the cascade cross-over relations between gamma rays from ^{133}Cs, which were measured with a large Ge(Li) detector. Their gamma-ray energies have been recommended by Helmer and Leun [10] for the energy calibration of Ge detectors.

Chauvenet et al. [11], after an international intercomparison of photon-emission-rate measurements of ^{133}Ba decay, pointed out that although the gamma ray intensity results appear to be satisfactory above 100 keV, the deviations between the results in the energy region below 100 keV were higher—amounting to several percent, hinting at a need for better data and methods. But, exhaustive nuclear data evaluations by Be et al. [12] as well as Khazov et al. [13] show that the most recent measurements of gamma-ray emission probabilities or relative intensities by Hwang et al. [14] and Miyahara et al. [15] did not address this need. The former applied the subtraction of Compton scattered events in single γ-ray spectra obtained using a Ge detector and NaI (Tl) gamma detector, but measured the precision intensities of only 6 peaks above 160 keV. Miyahara et al. [15] focussed on the determination of the emission probabilities of the weak 160 keV and 223 keV gamma rays with

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Scattering of Higher Order Mode Clusters (HOMC) from surface breaking notches in plates with application to higher temperature gradients

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ABSTRACT

The potential of higher frequency ultrasonic guided wave mode cluster (HOMC) waves to be used for remote inspection of notch defects in plate-like structures is investigated, at room and elevated temperatures. Quantitative studies of HOMC interaction with notch defects ranging from 5% to 50% of plate thickness are performed using 2D finite element simulations, and are validated by controlled experiments performed, firstly at room temperature. Analysis using reciprocity-based relations is used to uncover for the first time, how the constituent modes of HOMC play a vital role in their scattering processes. Further experiments are used to show that the results are stable up to 300°C, thereby demonstrating the feasibility of short range higher-resolution remote inspection of notch defects using non-dispersive higher frequency mode clusters in industrial conditions.

1. Introduction

Joining processes such as welding that result in elevated temperatures, can only be examined after the process is completed and the sample has cooled down. Here, an ultrasonic guided wave based remote non-destructive evaluation (NDE) technique that can be used to inspect regions heated to moderate temperatures is proposed. Guided waves arise out of the interaction of material boundaries with bulk ultrasound and are attractive for rapid long-range scanning of structures, with their characteristics widely studied and documented [1]. They have become popular, especially in the oil and gas industry, for the inspection of pipes and pipe sections [2–5]. Lamb waves, which are guided waves supported by plate-like structures, have also been studied with much interest, for the inspection of flat metallic and composite components [6,7].

Guided waves can probe a long distance from a single transducer location, unlike conventional point-by-point ultrasonic inspection. Thus, probe accessibility over the entire structure is not an issue when operating in severe conditions. Guided waves also create a stress profile throughout the thickness of the specimen and can therefore be used to detect both surface and internal defects. Moreover, guided wave modes can be selectively used to inspect parts of layered or coated structures (see for example, Ref. [2,6,8] for a discussion of guided wave inspection benefits and potential).

Extensive analytical, numerical and experimental studies are available on guided waves and their application to inspection of defects in plate and pipe structures (an early example is in Ref. [9]). References [10,11] discuss guided wave mode selection and mode conversion due to scattering, while others discuss wave scattering from canonical defects (see for example: Ref [12–14]), imaging [15,16], and wave interaction with complex features [17–20].

While such studies demonstrate feasibility of rapid remote inspection and monitoring of practical structures using guided waves, important challenges, however, still remain. Most current guided wave methods operate in the low frequency regime [2,6,8,15]. They rely on being able to generate individual non-dispersive lower order modes in structures, which is often a challenge especially in thicker specimens. Moreover, the large wavelengths used limit the resolution achievable. Hence, there is much interest in studying higher frequency approaches that can improve guided wave inspection resolution.

Higher Order Mode Cluster (HOMC) waves were first discovered, named so and reported by the authors research group in recent years, and are attractive for this purpose, especially when range of operation required is less than a meter [21–24]. HOMC consists of multiple higher order guided waves that travel together as a cluster, without appreciable dispersion for distances in the range of meters, due to their similar speeds.

The objective of the present paper is two-fold. Firstly, the interaction of HOMC waves with notch-type defects in plates is studied (at both

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Microhardness and SHG efficiency of pure and picric acid-added KDP crystals

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Abstract. Pure and picric acid-added KDP (potassium dihydrogen phosphate) crystals are grown by slow evaporation technique from aqueous solution. Unit cell parameters for pure and doped KDP crystals were measured from single-crystal X-ray diffraction studies. Vickers and Knoop microhardness studies were carried out on the grown crystals over a load range of 0.1 to 0.5 N. The microhardness decreases with load P, i.e., normal indentation size effect (ISE), and from Meyers index it is shown that grown crystals falls in to hard material category. Mechanical properties, such as Young's modulus, yield strength, elastic stiffness constant, were calculated for pure and doped KDP crystals. Hardness anisotropy has been observed in accordance with the orientation of the crystal. Etching studies were carried out using aqueous solution as an etchant. Improved second-harmonic generation efficiency is observed for doped KDP crystals in comparison to pure KDP crystals.

Keywords. Crystal growth; indentation; hardness; second-harmonic generation.

1. Introduction

Growth of nonlinear crystals by slow evaporation method is proved to be a prominent technique for growth of good-quality single crystals [1–3]. Good quality nonlinear optical single crystals are used to produce laser mega pulse in nuclear fusion reactions, higher harmonic generation, optical computing, optical data storage and optical communications [4]. KDP (potassium dihydrogen phosphate) is one of the promising nonlinear optical crystal used for electro-optic effect [5], Pockels cell and frequency converters [6]. Unidirectional bulk growth of KDP crystals of size 30 mm diameter and 55 mm height was grown successfully by using Sankaranarayanan–Ramasamy (SR) method [6]. Large single crystals of dimensions 600 × 600 × 500 mm^3 were grown successfully and reported for second-harmonic generation (SHG) applications and laser radiation conversion [7]. Several studies have been carried out by variety of dopants in KDP crystals and reported [8–16].

Picric acid ($C_6H_3N_3O_7$) is an organic compound with IUPAC name 2,4,6-trinitrophenol. Picric acid shows excellent SHG efficiency while reacting with selective amino acids and organic salts. The SHG efficiency of L-proline picrate is found to be 52 times and for L-threonine picrate is 43 times higher that of standard potassium dihydrogen orthophosphate (KDP) [17, 18]. It is highly advisable to study hazardous information, handling and safety measures before performing experiments related to picric acid [19].

Hence in the present study, picric acid has been selected as a dopant material to KDP crystal to study the behaviour of mechanical properties and SHG efficiency. Studies has been carried out for dopant from 0.1 to 0.5 mol% picric acid and from the results it is observed that the dopant at 0.5 mol% picric acid shows better results in microhardness and SHG efficiency. The purpose of this study is to investigate and present the behaviour of mechanical properties and SHG efficiency of doped KDP crystals by 0.5 mol% picric acid.

Vickers and Knoop's microhardness studies have been carried out on grown pure and 0.5 mol% picric acid-doped KDP crystals. Microhardness studies reveal the mechanical properties of the crystals such as Young's modulus, yield strength, stiffness constant and hardness anisotropy [20]. The practical application of any nonlinear optical materials depends on its microhardness and SHG efficiency for device fabrication process [21].

2. Materials and methods

2.1 *Crystal growth*

High-purity salts of KDP and picric acid are purchased from Sigma-Aldrich for crystallization process. Initially, the salt

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Regular paper

Compact symmetrical slot coupled linearly polarized two/four/eight element MIMO bowtie DRA for WLAN applications

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ABSTRACT

This paper presents a compact and low cost MIMO (Multiple-Input-Multiple-Output) Bowtie dielectric resonator antennas for two, four and eight elements for public safety entities (4.94–4.99 GHz) and indoor WLAN (5.15–5.35 GHz) applications. The fractional impedance bandwidth (4.72 GHz – 5.44 GHz) is 14.17% for all ports and strengthens the targeted frequency range gain. Two bubbled I-shape embedded inside the rectangular box defective ground structure to enhance the separation between ports by etching therefore over the operating frequency band, isolation between ports exceeds 25 dB and maximum ECC (envelope correlation coefficient) of 0.04. The designed compact unit cell antenna has a dimension of 30 × 25.6 mm^2 (i.e. 0.5λ_0 × 0.4 λ_0 where λ_0 is calculated at 5.2 GHz in the free space) and finally proposed 8-element antenna having a size of only 120 × 51.2 mm^2 (2.07 λ_0 × 0.88 λ_0). Within their finest values, MIMO diversity performance parameters are obtained. The gain of the antenna unit cell, two, four and eight elements are 5.24 dBi, 5.49 dBi, 5.68 dBi and 6.2 dBi respectively and these gain values are most suitable for WLAN applications. To show the simulated performance, a prototype of all radiators would be manufactured and tested experimentally and measured results are good agreement with simulation result.

1. Introduction

The requirements for antenna design are constantly changing as a result of the rapid progress of wireless communication. A high efficiency, large bandwidth and compact antenna that meets RF and wireless requirements is a major challenge. Its narrower bandwidth in nature is the main limitation of the micro strip antennas [1], while the dielectric resonator antennas (DRA) are being investigated in order to reduce these limitations. In microwave antennas, dielectric resonator antennas (DRAs) are preferred to replace traditional microwave-frequency radiation elements [2,3] due to reduced radiation efficiency, narrow impedance bandwidth, and conductor losses. This is due to increased gain, increased radiation, broadband width, increased allow ability and high thermal capacity of DRAs. DRAs are also easily integrated and provide a choice of bandwidth, radiation characteristics and ease of feed arousal with a variety of coupling techniques. DRAs are particularly relevant for applications involving radar and millimeter waves. Rectangular, triangular, circular, conical, cylindrical, etc. DRA forms are mainly available [4]. MIMO technology has a key role to play in providing access to a number of consumers [5] with different additional features. MIMO antennas are the solution to meet the requirements for improved channel gain, bandwidth, data transfer, channel strength compared to single-element antenna. Multi-input multi-output (MIMO) antennas are two or more in a single box designed for wireless transmission and reception technology applications. Data and range are increased by the use of multiple antennas compared to a single antenna with the same transmission power. The efficiency of connections with less fading is further enhanced by MIMO antennas [6]. The transmission of multiple data streams increases the wireless bandwidth at the same time. Generally, many users can access different services at the same time using MIMO technology. The dielectric resonator antennas are also presented in the following literature: up to 16 elements together with 2 elements of the MIMO antenna have been simulated and measured in the [7] broadband rectangle dialectical resonator array. A dielectric resonator antenna with a circular polarization with an asymmetric cross slot in the form of a bowtie is proposed in [8]. In [9], a dielectric resonator array antenna is presented for enhanced wireless applications. We discussed the mutual

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Preparation and characterisation of new Ti/Fluorapatite/MWCNTs ternary nanocomposite and its catalytic activity in the synthesis of pyrazolo[3,4-b] quinoline moieties

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ABSTRACT

We describe the preparation of a new ternary nanocomposite, (Ti/FAp/MWCNTs) constituting titania, fluorapatite and multiwalled carbon nanotubes. First, the fluorapatite (FAp) nanostructures were developed using glutamic acid as crystal growth modifier. The FAp was then reacted with functionalised MWCNTsand TiO_2 *via* sonication in ether. The Powder XRD, FT-IR, and microscopic analysis (SEM and TEM) of the new nanocomposite, Ti/FAp/MWCNTs revealed three phases. TiO_2 and FAp particle' sizes were between 50–60 nm and 40–60 nm diameter, respectively. The ternary nanocomposite demonstrated excellent catalytic efficiency for synthesising new pyrazolo[3,4-b]quinolones. The synergy between the Lewis acidic and basic sites contributed to the nanocomposite's effectiveness. Impressive yields (91–95 %) of quinolone derivatives were accomplished in short reaction time (*ca.*15 min) in the green solvent, EtOH at room temperature. Recyclability with consistent activity (>5 times) is the added advantage of the Ti/FAp/MWCNTs nanocomposite.

1. Introduction

The utility of composite materials is fast broadening in all fields, including chemical and pharmaceutical, due to their exceptional tunable properties. From clothes to computer hard drives, composite materials play a significant role in manufacturing several everyday use products [1–4]. Besides the commercial developments, the nanoscale composites have a wide variety of applications in the fields of luminescence, magnetism, sensors, drug delivery, gas storage and catalysis [5–9]. Unlike the micro composites, nanocomposites' properties are easily adaptable to further the material's performance. In nanocomposites, all the constituents could be in nanosize or some phrases in nanoscale [10–12]. Nanocomposites comprise two or more compounds, which individually endorse a unique property to the entity and finally endorsing intrinsic unchanged characteristics. The supporting component mostly accommodates the active ingredients, and in some cases, even support material can act partially or entirely as an active constituent [13–15]. There are several approaches for the synthesis of nanocomposites. Appropriate methods synthesise individual components, and all the different features are fused in together. In another approach, nanocomposites are prepared *in-situ* by adopting a single preparation method [16–20]. The nanocomposites thus developed with significantly improved capabilities are typically utilised in various applications, including catalysis.

Many of the commercially viable value-added conversions are catalyst-driven processes. The use of environmentally friendly multicomponent composites, with enhanced selectivity and activity as catalysts, is an attractive option. The design of composite with one or more active components facilitate the interaction between catalysts and support and improves the catalytic properties and efficiency [21–23]. The coordination between the composite constituents improves the catalytic activity and renders good stability and long-life, and selectivity towards target products. Composites with nanosize particles accrue more versatility due to more surface area, increasing active sites' population on their surfaces [24–26]. The synergetic effect resulting from cooperation between different catalytic active components and active ingredients and support also enhances the composite's overall catalytic efficiency. The studies reveal that increased activity, lifetime, %

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Forecasting the Spread of COVID-19 Pandemic with Prophet

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Keywords:
COVID-19, Fbprophet, time series analysis, machine learning

ABSTRACT

COVID-19 pandemic shook the whole world with its brutality, and the spread has been still rising on a daily basis, causing many nations to suffer seriously. This paper presents a medical stance on research studies of COVID-19, wherein we estimated a time-series data-based statistical model using prophet to comprehend the trend of the current pandemic in the coming future after July 29, 2020 by using data at a global level. Prophet is an open-source framework discovered by the Data Science team at Facebook for carrying out forecasting based operations. It aids to automate the procedure of developing accurate forecasts and can be customized according to the use case we are solving. The Prophet model is easy to work because the official repository of prophet is live on GitHub and is open for contributions and can be fitted effortlessly. The statistical data presented on the paper refers to the number of daily confirmed cases officially for the period January 22, 2020, to July 29, 2020. The estimated data produced by the forecast models can then be used by Governments and medical care departments of various countries to manage the existing situation, thus trying to flatten the curve in various nations as we believe that there is minimal time to do this. The inferences made using the model can be clearly comprehended without much effort. Furthermore, it tries to give an understanding of the past, present, and future trends by showing graphical forecasts and statistics. Compared to other models, prophet specifically holds its own importance and innovativeness as the model is fully automated and generates quick and precise forecasts that can be tunable additionally.

1. INTRODUCTION

Asia was the centre of the initial outbreak that spread from China in early 2020. To date, around 2.48 million deaths have been reported. It has proved far more fatal than other coronavirus family members, with a fatality ratio of 1.4%. Coronaviruses are, in general, a family of viruses [1] that end up triggering sickness in both animals as well as humans. There are specific severe diseases that were brought on by coronaviruses in the mid-1960s. A couple of them are Middle East Respiratory Syndrome (MERS) [2] and Severe Acute Respiratory Syndrome (SARS) [3]. COVID-19 is again a brutal illness disease triggered by the most lately identified coronavirus. The outbreak of this illness took Place in Wuhan, a city in China, in December 2019 [4].

COVID-19 has now turned into a pandemic, thus affecting countless individuals around the globe. Although most people with COVID-19 have mild to moderate symptoms like body temperature, coughing, and fatigue. The disease can cause severe medical complications like Pneumonia, Organ failure, Heart problems, lung infections, Blood clots, Acute kidney injury, viral and bacterial infections.

Whenever an infection or a microbial illness emerges, it experiences local transmission and thus Coronavirus too. Information has actually revealed that it spreads out primarily from one person to another amongst those in a range of 6 feet or 2 meters. In some circumstances, the virus can be spread by an individual being subjected to tiny drops of coughing, sneezes, exhales, physical chats that remain in the air for a good amount of time thus airborne transmission. The tiny droplets can be breathed in through mouth, nose and can get in contact of eye of an individual. It can likewise spread out if an individual comes in contact with the surface of any object that is exposed to the Infection droplets.

According to the sources, the majority of people (about 80%) tend to recuperate from the disease without needing to take hospital treatment. Sources even claim that 1 out of every five individuals who meet the virus becomes seriously ill and develops issues like difficulty in breathing. Currently, governments are taking preventive measures such as social distancing, sanitization, carrying out lockdowns, etc. Early recognition of symptomatology, prompt diagnostic measures, effective home and hospice management, and appropriate preventive steps.

In India, there was no exponential growth observed in the initial state as compared to other countries due to stringent implementations of lockdown. However, now the cases have been increasing at a high rate, and the government is trying to carry out various approaches of safety while opening the lockdown in certain areas as things ultimately need to be like before to handle the Indian economic situation in this pandemic. While the government is doing its job, forecasts like this will be extremely beneficial to comprehend the future. Thus, the government can make even more rigorous regulations to handle the issue. For achieving the forecasts, we chose to work with time-series data-based statistical models, and the "Prophet" model [5] has shown us good results in predicting both short term and long term forecasts.

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Physical and *in-vitro* evaluation of pure and substituted $M_xCe_{1-x}O_2$ (M = Co, Fe or Ti and $x = 0.05$) magnetic nanoparticles

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Abstract

High resolution TEM studies revealed the spherical morphology of $M_xCe_{1-x}O_2$ (M = Co, Fe or Ti, $x = 0.05$) particles with their size in the range of 8–11 nm. Raman, UV and PL spectroscopy analyses evidenced that oxygen vacancy concentration modified with the type of dopants. The concentration of vacancies in the $Co_{0.05}Ce_{0.95}O_2$ sample was relatively higher and hence it had optimum magnetization value. The *in-vitro* cytotoxicity study for $M_xCe_{1-x}O_2$ (M = Co, Fe or Ti, $x = 0.05$) nanoparticles against human lung adenocarcinoma (A549 cells) was conducted. The results suggested that at a 10 μg/mL concentration, the undoped CeO_2 nanoparticles have shown cell viability up to 99%. In contrast, at the same concentration, the doped CeO_2 such as $Co_{0.05}Ce_{0.95}O_2$, $Fe_{0.05}Ce_{0.95}O_2$ and $Ti_{0.05}Ce_{0.95}O_2$ nanoparticles demonstrated the cell viability of ~97%. Furthermore, the samples displayed reliable biocompatibility up to 1000 μg/mL concentration. Interestingly, Co-doped CeO_2 nanoparticles exhibited relatively higher biocompatibility against A549 cells at all concentrations. Further, the higher amount of vacancies might have improved the free radical scavenging effect and so the biocompatibility for the samples.

Previous Next

Keywords

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ARTICLE

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Efficacy of cobalt-incorporated mesoporous silica toward photodegradation of Alizarin Red S and its kinetic study

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Abstract

Cobalt-incorporated mesoporous silica (Co-MCM-41) has been synthesized along with MCM-41. The materials were characterized using powder X-ray diffraction, scanning electron microscope, and nitrogen adsorption–desorption study techniques. The surface area (S_{BET}, m^2/g), pore size (Å), and pore volume (cc/g) have been found to be reduced in the Co-MCM-41 compared with MCM-41. Furthermore, the Scanning electron microscopy coupled with energy dispersive X-Ray spectroscopy (SEM-EDAX) analysis has clearly shown the presence of the respective elements in the materials. The bandgap (eV) was also significantly reduced in the Co-MCM-41 compared with its parent template, observed by applying the Kubelka-Munk function to the results of UV–Vis DRS. The materials were successfully used as photocatalysts in the photodegradation studies of the Alizarin Red S dye, and pseudo-first-order kinetics was performed using the Langmuir-Hinshelwood kinetic model. All the required experimental conditions were optimized.

KEYWORDS

Alizarin Red S., mesoporous silica, photocatalyst

1 | INTRODUCTION

Heterogeneous catalysts have attained much importance in recent years due to economic and environmental considerations. These catalysts are generally inexpensive, highly reactive, ecofriendly, and highly selective, with a simple workup and recoverability of catalysts.[1] Mesoporous MCM-41 materials have emerged as compounds with large surface area and high stability. They have been widely employed in many reactions as a catalyst or catalyst support. This was attributed to the greater reusability and easy recoverability of the reaction mixture.[2] The incorporation of metal ions such as Ti^{4+}, Al^{3+}, Co^{3+}, Fe^{3+}, etc. into the framework has shown greater catalytic activity due to enhanced oxidative or acidic character.[3]

Today, the entire world is facing environmental problems due to contaminated groundwater and hazardous industrial effluents.[4,5] These effluents are highly colored, and their disposal into the water system causes damage to the environment as they affect photosynthetic activity in aquatic life owing to the reduced light penetration.[6,7] The presence of dyes in very low concentrations (1 mg/L) in the effluent imparts intense color and is found to be hazardous to the environment.[8,9] Thus, efficient color removal from waste waters use physical or chemical methods.[10] A majority of the dyes consumed at the industrial scale are derivatives of azo, anthraquinone, indigoid, triphenylmethane, xanthene, phthalocyanine etc. .[11,12] These dyes are used extensively in textile industries owing to their favorable characteristics of bright color and simple application with low energy

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A study on assessment of vulnerability of seawater intrusion to groundwater in coastal areas of Visakhapatnam, India

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Abstract
With an attempt to make a useful and convenient database, a case study has been conducted on impact of seawater intrusion to groundwater in the coastal localities of Visakhapatnam, India. Thirty groundwater samples were collected from varied locations covering at a stretch of 50 km from Bhemili to Paravada of Visakhapatnam coastal region. The groundwater samples were collected in pre- and post-monsoon in the year of 2017. The analytic studies to assess the quality of water were conducted. In comparison with WHO standards, chloride ion exceeded the permitted levels in (70% and 73%) of samples, calcium ion (23.3% and 13.3%) of samples, TDS (100% and 100%)of samples in pre- and post-monsoon seasons, respectively. The hydrochemical facies evolution diagrams and piper diagrams were used as tools to ascertain the factors and mechanisms responsible to vulnerability of groundwater due to seawater intrusion. As per the study, a type of mixed groundwater has been identified in the both the seasons. About 16% and 10% of samples were prone to seawater intrusion during pre- and post-monsoon seasons, respectively.

Keywords Groundwater pollution · Seawater intrusion · Water quality parameters · WHO standards · HFE-D · Piper diagrams · Seawater fraction index

1 Introduction

Groundwater assessment is now an indispensable activity on regular basis, since it is the major water source for all activities from household to industry, in many countries (Gupta and Misra 2019; Madhat et al. 2018; Chatterjee et al. 2010). As a natural and renewable resource, groundwater quality plays a pivotal part in water management all over the world. In comparison with groundwater, surface water is more vulnerable to pollution and its availability also randomly changes with seasons. The dependence on groundwater is

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Impact of Negative Arrivals and Multiple Working Vacation on Dual Supplier Inventory Model with Finite Lifetimes

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Abstract

In this paper we analyzed an inventory model with two-suppliers, finite life times, multiple working vacations and customers who arrive according to RCE process. Perishable and replenishment rates of two-suppliers are exponentially distributed. The server takes exponential working vacations when the queue is empty. Arrival process follows Poisson distribution and the probability for an ordinary customer is p and for negative customer is q. Limiting distribution of the assumed model is obtained. Numerical results are presented for cost function and various system performance parameters. The impact of two-suppliers on the optimal reorder points will be useful in developing strategies for handling various perishable inventory problems with replenishment rates.

Keywords: (s,S) policy, Two-supply inventory, Lead time, RCE process, Multiple working vacations, Matrix analytic method.

1 Introduction

In an (s,S) inventory policy, the quantity $Q(=S-s)$ is placed if inventory falls to s, so that the maximum inventory level is S. This policy has been widely discussed for almost a century. However in inventory models with more than one supplier we can improve the quality of service, develop strong relationship with the customers, reduce loss of sales due to stock shortages, enhanced profits, etc. In two-supply (s,S) inventory policy, two orders of quantities Q_1 and Q_2 are placed whenever inventory level drops to r and s respectively. For literature on inventory models with two supplies one can refer Yang and Wei-Chung [12] and Vijayashree and Uthayakumar [8].

The life time of inventory items is indefinitely long in many classic inventory models like, vegetables, food items, medical products, etc., which become unusable after a certain period. That means there exists a real - life inventory system which consists of products having a finite lifetime.

mathematics

MDPI

Article

Green Energy Efficient Routing with Deep Learning Based Anomaly Detection for Internet of Things (IoT) Communications

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Abstract: Presently, a green Internet of Things (IoT) based energy aware network plays a significant part in the sensing technology. The development of IoT has a major impact on several application areas such as healthcare, smart city, transportation, etc. The exponential rise in the sensor nodes might result in enhanced energy dissipation. So, the minimization of environmental impact in green media networks is a challenging issue for both researchers and business people. Energy efficiency and security remain crucial in the design of IoT applications. This paper presents a new green energy-efficient routing with DL based anomaly detection (GEER-DLAD) technique for IoT applications. The presented model enables IoT devices to utilize energy effectively in such a way as to increase the network span. The GEER-DLAD technique performs error lossy compression (ELC) technique to lessen the quantity of data communication over the network. In addition, the moth flame swarm optimization (MSO) algorithm is applied for the optimal selection of routes in the network. Besides, DLAD process takes place via the recurrent neural network-long short term memory (RNN-LSTM) model to detect anomalies in the IoT communication networks. A detailed experimental validation process is carried out and the results ensured the betterment of the GEER-DLAD model in terms of energy efficiency and detection performance.

Keywords: Internet of Things; deep learning; anomaly detection; energy efficiency; routing

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1. Introduction

The modern world adopts recent communication technologies to make a complete network coverage system and extended the intelligent object count which is correlated to the deployed system. One of the effective patterns named Internet of Things (IoT) is capable of increasing the volume of data generated from the Internet by connecting users and modern tools. Moreover, the IoT faces some issues, especially in location and time while connecting to humans and machines [1]. Moreover, IoT intends to achieve Quality of Service (QoS) such as energy, delay, throughput, etc. Bandwidth is one of the significant sources in the IoT platform, and appropriate management is essential to accomplish maximum QoS. Furthermore, the requirement for multimedia facilities in IoT platform is enhanced intensely. It finds useful in smart grids, smart homes, etc. [2,3]. Various services in IoT have distinct characteristics and QoS mechanisms. The fundamental strategy of IoT is to correlate one another with the help of the internet. In future, numerous applications might be developed and one among them is modern city. The exploitation of IoT has been increased rapidly and some of them are food, textiles, organization, transportation, academics, entertainment, and so forth.

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Enhanced magnetoelectric coupling in $Bi_{0.95}Mn_{0.05}FeO_3$–$Ni_{0.5}Zn_{0.5}Fe_2O_4$ nanocomposites for spintronic applications

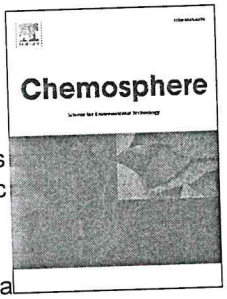
K. V. Vivekananda, B. Dhanalakshmi, B. Parvatheeswara Rao & P. S. V. Subba Rao

Applied Physics A **127**, Article number: 187 (2021)

Abstract

Multiferroic nanocomposites with the chemical formula, $(x).Bi_{0.95}Mn_{0.05}FeO_3$-$(1-x).Ni_{0.5}Zn_{0.5}Fe_2O_4$, (where $x = 0.2$, 0.4, 0.5, 0.6, and 0.8) have been synthesized using sol–gel autocombustion and conventional solid-state reaction methods. Resistivity and impedance measurements were taken in order to understand the properties of the conductivity of the samples. Multiple hopping mechanisms were evident from the studies of impedance analysis with the traces of different trends from Nyquist plots. Magnetoelectric (ME) coupling coefficient (α_{ME}) studies were taken in order to understand the possible coupling in the synthesized composites. The composites exhibit different values for α_{ME}, and it was observed to be varying systematically in accordance with the mixing ratios of the individual

Journal Pre-proof



Ultra-small zinc oxide nanosheets anchored onto sodium bismuth sulfide nanoribbons as solar-driven photocatalysts for removal of toxic pollutants and photoelectrocatalytic water oxidation

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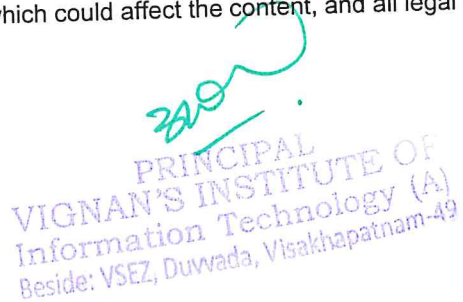

Journal of Ambient Intelligence and Humanized Computing
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ORIGINAL RESEARCH

An effective deep learning features based integrated framework for iris detection and recognition

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Received: 9 March 2020 / Accepted: 30 May 2020

Abstract
In recent years, Iris recognition has emerged as an important and trustworthy biometric model to recognize humans. The application of automatic iris recognition models find useful in different fields namely border control, citizen confirmation, and criminal to commercial products. This paper introduces an effective deep learning (DL) based integrated model for precise iris detection, segmentation and recognition. The projected model involves different stages namely preprocessing, detection, segmentation and recognition. Initially, preprocessing of images takes place to improve the quality of the input image using Black Hat filtering, Median filtering and Gamma Correction. Then, Hough Circle Transform model is applied to localize the region of interest, i.e. iris in an effective way. Afterwards, Mask region proposal network with convolution neural network (R-CNN) with Inception v2 model is applied for trustworthy iris recognition and segmentation i.e., recognizing iris/non-iris pixels. For validating the results of the presented model, a detailed simulation takes place using a benchmark CASIA-Iris Thousand dataset and the results are validated interms of detection accuracy. The attained simulation outcome depicted that the projected technique shows maximum recognition accuracy of 99.14% which is superior to other methods such as UniNet. V2, AlexNet, VGGNet, Inception, ResNet and DenseNet models in a significant way.

Keywords Iris recognition · Classification · Segmentation · Deep learning · Mask R-CNN

1 Introduction

Iris recognition is defined as an automatic process of recognizing iris patterns in human beings. There are few iris recognizing techniques that depicts a minimum false mapping values as well as maximum efficiency in massive databases. The study of large-scale estimation surveyed under the National Institute of Science and Technology (NIST) has noticed the most important prediction of iris recognition in operation cases. In addition, around one billion people have induced in Unique Identification Authority of India (UIDAI) program, 160 million individuals from national ID survey of Indonesia, and ten million persons from US Department of Defense programs. Hence, iris plays a major role in the upcoming generation of large-scale identifying methods.

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On a class of Lorentzian para-Kenmotsu manifolds admitting the Weyl-projective curvature tensor of type $(1,3)$

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Abstract. In this present paper, we consider a class of Lorentzian almost paracontact metric manifolds namely Lorentzian para-Kenmotsu (briefly LP-Kenmotsu) manifolds admitting the Weyl-projective curvature tensor of type $(1,3)$. We study and have shown that Lorentzian para-Kenmotsu manifolds admitting a flat curvature tensor, an irrotational curvature tensor and a conservative curvature tensor are an Einstein manifolds of constant scalar curvature. Further we study Lorentzian para-Kenmotsu manifolds satisfying the curvature condition $R(X,Y)\cdot W_2 = 0$. At the end, we construct an example of a 3-dimensional Lorentzian para-Kenmotsu manifold admitting Weyl-projective curvature tensor which verifies the results discussed in the present work.

Keywords: Lorentzian paracontact manifolds, W_2-curvature tensor, Einstein manifold, scalar curvature.

1. Introduction

In 1989, K. Matsumoto [3] introduced the notion of Lorentzian paracontact and in particular, Lorentzian para-Sasakian (LP-Sasakian) manifolds. Later, these manifolds have been widely studied by many geometers such as Matsumoto and Mihai [4], Mihai and Rosca [6], Mihai, Shaikh and De [7], Venkatesha and

*. Corresponding author

Smart Devices Performance with SSK-BPSK Modulation and Energy Harvesting in Smart Cities

Hemanta Kumar Sahu, Ashish Kumar Padhan, *Student Member, IEEE*, and P. R. Sahu, *Member, IEEE*

***Abstract*—In this letter, we analyze smart devices' performance in smart cities using radio frequency (RF) based energy harvesting. In a smart city, smart electronics devices play an important role in communication between the devices and centralized access point (AP). Here, we have considered dynamic space shift keying (SSK) and binary phase-shift keying (BPSK) modulation for communication. A single radio frequency (RF) chain of the transmitter dynamically changes the modulation scheme between SSK and BPSK. Based on one-bit feedback from the receiver antenna, the modulation scheme is selected, and this feedback path can be used for energy harvesting. Using multi-user selection combining, the average bit error probability (ABEP) performance of smart devices with wireless power communication network (WPCN) is derived in closed form over Saleh-Valenzuela (S-V) channel.**

***Index Terms*—ABEP, BPSK, Smart City, SSK, Smart devices, S-V Channel, WPCN.**

I. Introduction

Smart City supports to improve the lifestyle by allowing innovative services friendly and economically. In a smart city, all the smart devices communicate or exchange vital information like image, video, audio files with each other or with central servers [1]. However, an effective increase in the number of smart city devices, the vast demand for wireless communication has triggered a sharp rise in energy consumption, and the greenhouse effect [2]. Moreover, due to the small size of the smart devices, the batteries used have limited power, which may drain quickly. Therefore, it is important to investigate smart devices' performance with energy harvesting for green communication when constructing green smart cities [3].

Energy harvesting for wireless communication networks allows to power the user terminals wirelessly from RF signals radiated by ambient transmitters [4]. Wireless powered communication network (WPCN) technology can use radio frequency (RF) signals as it carries both information and energy. Hence, the energy-constrained smart devices can use RF signal for energy harvesting (EH). While WPCN supports EH, space shift keying (SSK) modulation is a low complexity with high data rate based transmission. In SSK modulation, only a single antenna is activated from multiple antennas at a particular time instant to transmit the information [5]. But the transmit diversity in SSK modulation is one as it uses a single RF chain at the transmitter. To achieve more transmit diversity, a new scheme is introduced in [6], where the modulation changes dynamically between binary phase-shift keying (BPSK) and SSK modulation depending upon the channel condition. Thus, the benefits of DSB modulation incorporated with WPCN can be an energy reliable network with upgraded data service in smart city communication.

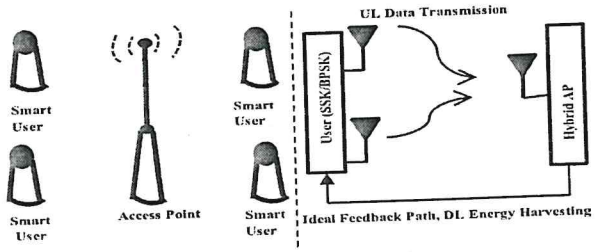

Fig. 1: Communication of smart users in smart city

The efficiency of a hybrid access point (H-AP) is studied in [1], where a two-dimensional Markov chain is exploited for analyzing the smart city's performance. The authors in [2] investigated the energy-efficient content delivery system and, in [3], explained the joint optimization of uplink sub-carrier assignment with a D2D communication network in a smart city. For information transmission, the DSB modulation scheme was first introduced in [6], where the authors derived a decision rule for selecting SSK or BPSK modulation. Further, recently in [8], the modulation is extended for higher order scheme. In [9], the authors introduced spatial modulation (SM) for RF energy harvesting context and derived an approximate bit error rate (BER) expression. Similarly, SSK modulation performance with WPCN is investigated in [10] over Rayleigh fading channel. The performance of SSK modulation with simultaneous wireless information and power transfer (SWIPT) over Rayleigh fading is analyzed in [11]. However, the concept of energy harvesting with DSB modulation in the context of multi-user communication is an open problem. To the best of the author's knowledge, it has not been analyzed.

In this paper, we have considered the device to access point (D2A) communication, where the H-AP can harvest energy from RF signals using the WPCN technology, and it can also process the information bits. As more than one user is sending the information to the H-AP, multi-user selection combining (SC) is applied to the smart city communication network. Since the smart devices can alter between an active state and doze state, the number of active devices can be modeled by the Markov chain. In the DSB modulation, a one-bit feedback path from the receiver to the transmitter is used to select the modulation scheme [7]. Here, using that feedback path, the H-AP transmits the harvested energy to the active devices.

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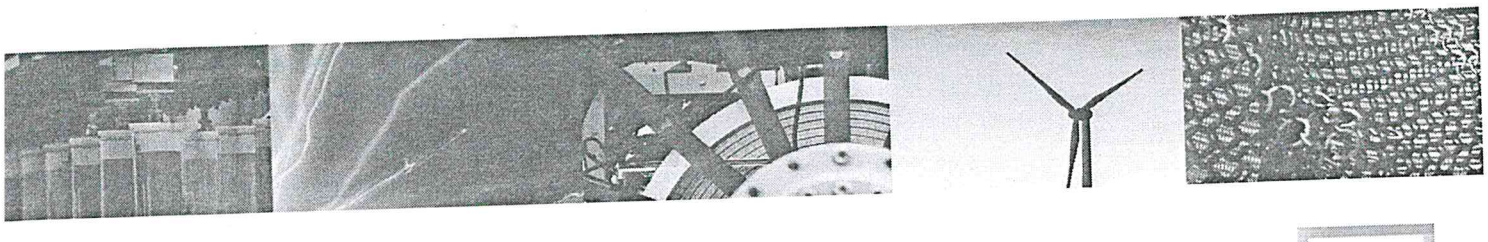

Research Article

DGS based monopole circular-shaped patch antenna for UWB applications

Dattatreya Gopi[1] · Appala Raju Vadaboyina[2] · J. R. K. Kumar Dabbakuti[3]

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Abstract
A simple low profile defected ground structure based monopole circular-shaped patch antenna is proposing for ultrawide-band applications. The design allows for a simple and compact structure on the FR-4 substrate material. The proposed design initially has a meager antenna gain and bandwidth. To increase the antenna bandwidth and gain, the defective ground structure is implemented with four dumble-shaped slots. Parametric analysis is considered to find the radius of circular patch for tuning of UWB frequency applications. The proposed MCP antenna resonates at 2.9 GHz, 9.1 GHz frequencies with a S_{11} of − 34.84 dB, − 33.74 dB, respectively, and achieves 8.1 GHz (2.5–10.6 GHz) impedance bandwidth concerning the − 10 dB reference line of the reflection coefficient. The gains are 8.4 dBi, 8.2 dBi for the two resonant frequencies, and the radiation patterns are semi-omnidirectional, omnidirectional. The proposed antenna has-been validated by observing good agreement between the simulation and the measured results.

Keywords Circular patch · Defected ground structure (DGS) · Monopole · Ultra-wideband (UWB) · Wireless applications

1 Introduction

Ultrawide-band (UWB) technology fascinated academia and industry focus on the wireless world since the federal communications commission (FCC) has officially assigned the 3.1–10.6 GHz spectrum to UWB communications applications in 2002 [1]. The extensive release of the 3.1–10.6 GHz spectrum for commercial applications has generated much interest in short-range wireless communications and the development of UWB technology for wireless applications, mage radar, remote sensing, location confirmation applications. The UWB antenna design's primary purpose is to reduce manufacturing efficiency, increase gain, and secure a wide bandwidth while maintaining good radiation efficiency. The compact [2] and low profile antenna [3] system is a unique role over traditional narrowband systems. Also, thin, lightweight, and easy to manufacture planar UWB antennas have received much attention to providing easy wireless access to multimode communication systems. A printed monopole antenna is manufactured on a substrate with a wide bandwidth that can cover UWB. In [4], a monopole circular ring-shaped antenna is proposed for UWB applications. Different shapes like rectangular, circular, elliptical, and curved monopole antennas have been reported in [5–8] to achieve UWB. There are a variety of shapes that can be used to design microstrip patches for example, dipoles, squares, rectangles, triangles, circles, circular rings, ring sectors, disk sectors. Circular patches have advantages such as design flexibility and have the highest bandwidth in GHz and provide acceptable lossy characteristics, enhanced gain, desirable electric field, and magnetic field strength patterns.

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SURFACE and INTERFACE ANALYSIS WILEY

RESEARCH ARTICLE

Oxygen partial pressure influenced stoichiometry, structural, electrical, and optical properties of DC reactive sputtered hafnium oxide films

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HfO_2 films have been deposited on quartz and p-type Si (100) substrates using DC reactive magnetron sputtering technique by sputtering of hafnium target at different oxygen partial pressures. Variation of cathode potential with oxygen partial pressure was systematically studied. The influence of oxygen partial pressure on chemical composition, crystallographic structure, and optical properties of HfO_2 films was systematically investigated. X-ray photoelectron spectroscopy and energy dispersive X-ray analysis were employed to determine the chemical composition. The films formed at oxygen partial pressure of 5×10^{-4} Torr were of stoichiometric HfO_2. X-ray diffractometer studies revealed that the films formed at 5×10^{-4} Torr were weakly crystallized with monoclinic structure. Optical bandgap of the HfO_2 films increased with increasing oxygen partial pressure. Metal oxide semiconductor structures with configuration of Al/HfO_2/p-Si were fabricated and studied its dielectric and electrical properties. From these studies, it is confirmed that HfO_2 film-based metal oxide semiconductor devices formed at an optimum oxygen partial pressure of 5×10^{-5} Torr showed dielectric constant of 13 with leakage current density of 4.7×10^{-7} A/cm^2.

KEYWORDS
hafnium oxide, leakage currents, optical bandgap, reactive sputtering, stoichiometry

1 | INTRODUCTION

For the last few decades, there was tremendous growth in the semiconductor industry because of the attractive applications of oxide/semiconductor sandwich structures not only in the field of microelectronics and nanoelectronics but also in biosensors,[1] gas sensors,[2] photovoltaic cells, carbon dioxide reductions, water splitting, and pollutant degradation.[3] On the other hand, the remarkable scaling down in silicon-based integrated circuits is the driving force for intensive investigations on oxide materials, which have high dielectric constant (high-k), low optical absorption, high refraction index, and large bandgap (>4.0 eV) for different applications in the field of microelectronic and optoelectronic devices.[4–8] Among various high-k materials, hafnium oxide (HfO_2) grabs the utmost intention to meet the scaling requirements of the International Technology Roadmap for Semiconductors because of its high dielectric constant and melting point (2800°C) and good thermal stability with silicon substrate.[9] Amorphous HfO_2 thin films formed on polymer substrates find applications in flexible thin film capacitors, computer memory elements, and fiber optical wave guides. Because of its low optical absorption in the visible wavelength, HfO_2 thin films find application in high laser damage coatings.[8] In comparison with various thin film deposition techniques, DC reactive magnetron sputtering has the advantage of producing thin films with uniformity on large-area substrates by sputtering the metallic target in the presence of reactive gas of oxygen and at low substrate temperatures. The physical properties of

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WILEY

SPECIAL ISSUE ARTICLE

Application of discrete transforms with selective coefficients for blind image watermarking

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Abstract

Watermarking scheme is not helpful in conveying the original image continually so as identifying the owner's mark from the watermarked image. In the current situation, our chosen topic is significant in real-time applications like fraud recognition, emergency clinic, and government divisions. In this study, an optimal multiblind watermarking model is proposed for the watermark detection process. Our proposed model is a combination of intelligent domain transforms like Discrete Shearlet Transform and Discrete Curvelet Transform (DCurT). The imperceptibility necessity of the plan is accomplished utilizing optimal coefficients that are performed by applying in DCurT with metaheuristic optimization model that is Grasshopper Algorithm. It is played by a chasing behavior of gathering of grasshoppers and cooperation process, here, Random Grasshopper Optimization is utilized for watermarking. The secret image is embedded with a lower band of optimal coefficients with DCurT, and here, the band is DCur (1, 5). The secret data is embedded in the host images to make it secure, and then, the extraction of the embedding process takes place inversely. For experimentation analysis, 20 digital images are considered, and different attacks are applied in the proposed watermarking model. Thus, the watermarked image looks lossless compared with the host image. Moreover, recent literary works and domain transform are also utilized for strength investigation of the proposed watermarking model.

1 | INTRODUCTION

Digital image supports have turned out to be illicitly simulated and restructured over different channels. To ensure digital media beside patent encroachments, digital watermarking was demonstrated as a result of this problem.[1] Rather than embedding one watermark, a facility of watermark data could build by implanting different watermarks into the equivalent digital images, and this ensuing method is called a multiwatermarking framework.[2] Watermarking systems likewise can classify depending on the use of the original image through the extraction process as in Figure 1. If, during the separating method, the first image is required, the this is known nonblind watermarking,[3,4] while a system is called blind if it works in the supposition that the first image would not be accessible at extraction.[5-7] Blind watermarking shows that, when identifying a message, it does not require some other put away data that relies upon the speculate image.[8] The customary machine learning-based watermarking methods do not go for learning a watermarking area.[9] The fundamental points of interest of this blind watermarking are that it do not require hosting data and appropriate for applications, for example, copyright assurance and security of medicinal information in telemedicine applications.[10,11]

Journal of Electromagnetic Waves and Applications >
Volume 36, 2022 - Issue 8

Research Article

An ELC meta-resonator inspired wideband wearable MIMO antenna system for biotelemetry applications

Soumendu Ghosh, Sourav Roy, Ujjal Chakraborty & Abhishek Sarkhel

Pages 1113-1129 | Received 09 Feb 2021, Accepted 07 Nov 2021, Published online: 25 Nov 2021

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Abstract

A compact wideband multiple-input multiple-output (MIMO) antenna for body-centric communication is presented in this article. Initially, an electric field-driven LC metamaterial resonator inspired monopole antenna is developed that exhibits 122.19 % (1.28–5.30 GHz) bandwidth covering 2.4 GHz WLAN and 3.5 GHz WiMAX application bands. Thereafter, the MIMO antenna is proposed, and a pair of meander line structure as a wideband decoupling network is introduced on the ground plane to reduce the inter-element coupling. The proposed antenna holds a reduced mutual coupling and low envelope correlation coefficient over the wideband. To explain the wideband antenna response and its decoupling

International Journal of Knowledge-based and Intelligent Engineering Systems

CPU runtime optimization in data damage tracking quarantine and recovery (DTQR) scheme based on customized ANN

Authors: M. Somasundara Rao, Koduganti Venkata Rao, M.H.M. Krishna Prasad Authors Info & Claims

International Journal of Knowledge-based and Intelligent Engineering Systems, Volume 25, Issue 3 • 2021 • pp 323–333 • https://doi.org/10.3233/KES-210075

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Abstract

Database Management Systems (DBMS) are regularly used to store and process touchy endeavour information. In any case, it is beyond the realm of imagination to expect to verify the information by depending on the entrance control and security instruments of such frameworks alone; clients may handle their benefits or go around security systems to malevolently adjust and get to the information. Hence, we have developed a reliable, secure, and real-time data damage tracking Quarantine and recovery scheme using Customized ANN approach. The proposed DTQR scheme recovers the accurate data from any newer data and eliminates the fraudulent data. The approach also provides a solution for runtime problems occurring in the DBMS. Moreover, the proposed technique implemented in the working platform of JAVA and the results are analyzed with existing techniques to prove the efficiency of the proposed system.

Machine hearing system for teleconference authentication with effective speech analysis

Article type: Research Article

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Abstract: The speaker identification in Teleconferencing scenario, it is important to address whether a particular speaker is a part of a conference or not and to note that whether a particular speaker is spoken at the meeting or not. The feature vectors are extracted using MFCC-SDC-LPC. The Generalized Gamma Distribution is used to model the feature vectors. K-means algorithm is utilized to cluster the speech data. The test speaker is to be verified that he/she is a participant in the conference. A conference database is generated with 50 speakers. In order to test the model, 20 different speakers not belonging to the conference are also considered. The efficiency of the model developed is compared using various measures such as AR, FAR and MDR. And the system is tested by varying number of speakers in the conference. The results show that the model performs more robustly.

Keywords: K-means, MFCC, SDC, LPC, GGD, AR, FAR, MDR

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A Comprehensive Survey of Emergency Communication Network and Management

Sanjoy Debnath, Wasim Arif, Sourav Roy, Srimanta Baishya & Debarati Sen

Wireless Personal Communications **124**, 1375–1421 (2022)

Abstract

The performance of wireless communication network is important in emergency rescue operations while ensuring optimum usage of limited wireless resources. Due to the disruption of normal wireless communication in a post-disaster scenario, the sustenance of an emergency communication network plays a significant role in relief operations. Under such a scenario, it becomes crucial to monitor the performance and reliability of the protocol in a time-bound manner. Some of the prominent challenges faced by the communication network during this period are related to energy efficiency, resources allocation, reliable connectivity, QoS, network throughput, and interoperability. A comprehensive performance appraisal of the emergency network considering the above-mentioned aspects is extremely important. This review provides a comprehensive survey of the

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An IoT-based agriculture maintenance using pervasive computing with machine learning technique

Authors: Kailasam, Swathi [1] ; Achanta, Sampath Dakshina Murthy [2] ; Rama Koteswara Rao, P. [3] ; Vatambeti, Ramesh [4] ; Kayam, Saikumar [5] ;

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In cultivation, early harvest offers farmers an opportunity to increase production while decreasing the chances of lower crop production rates, ensuring that the economy remains balanced. The significant reason is to predict the disease in plants and distinguish the type of syndrome with the help of segmentation and random forest optimization classification. In this investigation, the accurate prior phase of crop imagery has been collected from different datasets like cropscience, yesmodes and nelsonwisc . In the current study, the real-time earlier state of crop images has been gathered from numerous data sources similar to crop_science, yes_modes, nelson_wisc dataset.

In this research work, random forest machine learning-based persuasive plants healthcare computing is provided. If proper ecological care is not applied to early harvesting, it can cause diseases in plants, decrease the cropping rate and less production. Until now different methods have been developed for crop analysis at an earlier stage, but it is necessary to implement methods to advanced techniques. So, the detection of plant diseases with the help of threshold segmentation and random forest classification has been involved in this investigation. This implemented design is verified on Python 3.7.8 software for simulation analysis.

In this work, different methods are developed for crops at an earlier stage, but more methods are needed to implement methods with prior stage crop harvesting. Because of this, a disease-finding system has been implemented. The methodologies like "Threshold segmentation" and RFO classifier lends 97.8% identification precision with 99.3% real optimistic rate, and 59.823 peak signal-to-noise (PSNR), 0.99894 structure similarity index (SSIM), 0.00812 machine squared error (MSE) values are attained.

Soft Computing
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FOCUS

Cognitive computing-based COVID-19 detection on Internet of things-enabled edge computing environment

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Abstract
In the current pandemic, smart technologies such as cognitive computing, artificial intelligence, pattern recognition, chatbot, wearables, and blockchain can sufficiently support the collection, analysis, and processing of medical data for decision making. Particularly, to aid medical professionals in the disease diagnosis process, cognitive computing is helpful by processing massive quantities of data rapidly and generating customized smart recommendations. On the other hand, the present world is facing a pandemic of COVID-19 and an earlier detection process is essential to reduce the mortality rate. Deep learning (DL) models are useful in assisting radiologists to investigate the large quantity of chest X-ray images. However, they require a large amount of training data and it needs to be centralized for processing. Therefore, federated learning (FL) concept can be used to generate a shared model with no use of local data for DL-based COVID-19 detection. In this view, this paper presents a federated deep learning-based COVID-19 (FDL-COVID) detection model on an IoT-enabled edge computing environment. Primarily, the IoT devices capture the patient data, and then the DL model is designed using the SqueezeNet model. The IoT devices upload the encrypted variables into the cloud server which then performs FL on major variables using the SqueezeNet model to produce a global cloud model. Moreover, the glowworm swarm optimization algorithm is utilized to optimally tune the hyperparameters involved in the SqueezeNet architecture. A wide range of experiments were conducted on benchmark CXR dataset, and the outcomes are assessed with respect to different measures . The experimental outcomes pointed out the enhanced performance of the FDL-COVID technique over the other methods.

Keywords Federated learning · Internet of things · Edge computing · Deep learning · COVID-19 · Chest X-ray images · Cognitive computing · Pattern recognition

1 Introduction

Recently, cognitive computing has rapidly transformed the healthcare industry in assisting physicians in better treatment of diseases and improvising the patient services. The cognitive computing examines huge quantities of data promptly to respond to particular queries and offer intelligent recommendations. On the other hand, the rapid growth of social networking and Internet of things (IoT) applications results in a dramatic increase in the data created at network edges (Wang et al. 2019). It can be anticipated that the data generated rate would surpass the capability of the present Internet in the following days (Chiang and Zhang 2016). Because of the data privacy concerns and network bandwidth, it is not practical and often needless for sending the entire data to a remote cloud (Kelly 2016).

Local data processing and storing with global management is developed probably by the developing technologies of mobile edge computing (MEC) (Kelly 2016), whereas edge nodes like home gateway, sensor, small cell, and micro-server are outfitted with computation and storage capacity. Multiple edge nodes collaborate with the remote cloud for performing large-scale distributed tasks which include both remote coordination and execution and local processing. For analyzing huge numbers of data and attaining effective data for the prediction, detection, and classification of upcoming events, ML methods are

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Extended author information available on the last page of the article

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Research Article

A SCITECHNOL JOURNAL

Sustainable Energy Harvesting for Self-Powered Micro/ Nanosystems Enabled by Nanotechnology

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Abstract

The section provides an overview of energy collecting techniques that have the ability to energize nanosystems. The focus of our discussion is on methods apart from the well-known solar panel and thermoelectrics. The piezo nanomaterials made using aligned ZnO nanowire arrays are the focus of this paper. This is a base improving in manufacturing sector for transforming movement energy, vibration energy, and hydraulic energy into power for self-energized nanostructures.

Keywords: Nanomaterials; Self-energized system; Energy stroage

Introduction

Discovering sustainable, ecological, and clean sources of energy is the most pressing problem facing human humankind's long-term growth [1,2]. Injectable biosensors, ultrasonic biochemical and computational modeling sensors, nanorobotics, remote or mobile monitoring devices, homeland security, or even personal computers gadgets all produce power and technology to operate independently and continuously. A Nano robot, for instance, is envisioned as a micro controller that can detect and adjust to its surroundings, handle things, make decisions, and execute complicated duties. However, finding a source of power that can run the nanorobot while introducing much mass is a major issue.

A power supply is required for an implanted wireless biosensor, which can be given actively or passively via recharging the battery. It is extremely desirable for connected technologies to be self-powered but without batteries, and it is even necessary for implantable medical technology. As a result, developing nanotechnology that gathers information from the environment for self-powering such nanomaterial's is critical. This is an important step on the path to self-powered nano systems [3]. If only a tiny portion of this energy could be turned into energy, it could be enough to run modest biomedical equipment [4].

Microbes can be utilized to convert electrical bio convertible substrate into energy, with the bacterium acting as an electrode and electron flowing from the discharge via a resistance [5]. Direct glucose battery packs have been demonstrated to last 150 days in animal testing. All eukaryotic creatures, like humans, have oxygen and glucose in their cells and tissues. As a result, it is feasible to utilise a single SnO2 nanobelt to Detect Dimethyl Methylphosphonate (DMMP), a nerve agent stimulator, at a concentration of 50 ppb [6].

Using fuel consumption, vibrations, and Piezo (PZ) pulsation, researchers have devised different techniques for recycling power for mobile wireless nano electronics [7]. Photovoltaic (PV) is a well-known energy scavenging technique that uses a photon- electron excitation mechanism in organic semiconductors to transform sunlight into electricity. Our cells have the ability to create sufficient electricity to produce a variety of therapeutic devices, such as medication delivery systems, diagnostic instruments, and human enhancement technologies, in the human body [8].

Enzymes have been considered as a potential source of energy for future macroscopic systems [9]. The engines are powered by the ATP, which would be made up of covalently bonded adenine, ribose, and three phosphate groups. When the initial phosphate person exhales, a substantial quantity of energy is accompanied by the release of Adenosine Diphosphate (ADP), which is indicated by a coenzyme. If more force is generated, the additional phosphate is released, resulting in Adenosine Mono Phosphate (AMP) [10]. The energy generated is needed for photosynthesis, movement and dynamic ion and chemical transportation through cellular membrane. The chemical energy created by the oxidation of food is used to dephosphorylate ADP and AMP, which refuels ATP. As a result of this notion, ATP may be used as a battery charger within the human body.

The difference in energy between the two ends determines the voltage produced. The Dielectric constant often called the thermal energy or thermo power, is the constant of proportionality. This is the mechanical foundation for a thermometer, which is commonly used to monitor temperature. The amplitude of a generated thermoelectric voltage caused by temperature differential across a material is defined by its See beck coefficient. Charge particles throughout the substance, whether electron or holes, leak from the hot to the cold end whenever a temperature differential is introduced, similar to how a classic gas expands when warmed. Moving mobile leading provider to the cold side leave the opposite charges and stationary nucleus on the warm side, resulting in a thermodynamic voltage.

Among the most intriguing topics in nanotechnology is thermoelectric [11]. One-dimensional nanoparticles like Bi and BiTe, which have a high thermal conductivity but a high electrical conductivity, are particularly useful for increasing thermal energy. And the need to maintain a greater temperature differential between both the opposite edges of the gadget, electrical devices are typically huge.

Researchers have used three types of mechanical sensors to create vibration-based power stations: magnetic, electromagnetic, and piezo. In a tight circuit, a magnetic microgenerator uses a rotating magnetic or coils to embed and oscillating electric charge. The innovation produces large buildings ranging from 175 cm, going to explore vibratory distances from 50 Hz to 5 kHz which stimulate pneumatic fluctuations among one micrometre or over one millimetre, and producing energy ranging from thousands of W from over one kw.

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Abstract

Utilisation of high carbon alcohols in diesel engines as fuel is gaining importance among researchers because of its better fuel properties that are compatible with mineral diesel. The present study utilises two such alcohols namely octanol and decanol along with diesel and biodiesel derived from lemongrass. Two ternary blends, 50% by volume of diesel – 30% by volume of biodiesel – 20% by volume of octanol, and 50% by volume of diesel – 30% by volume of biodiesel – 20% by volume of decanol, were prepared, and different engine characteristics were analysed and compared with both neat diesel and biodiesel operation. Results indicated that peak cylinder pressure lowered with the ternary blend. Peak heat release rate was higher for octanol blend. When compared with octanol blend, 2.5% higher brake thermal efficiency was observed for decanol blend. However, still, the brake thermal efficiency was 3.5% lower than the diesel operation. The oxides of nitrogen emission for decanol blend were 4% lower than octanol blend. In general, smoke emission was lower for higher alcohol blends in comparison with the binary blend operation. Among the higher alcohol blends, octanol portrayed a 15% lower smoke opacity. Both the hydrocarbon emission and the carbon monoxide emission increased with higher alcohol blends. The study revealed that 1-decanol could be a potential fuel candidate for diesel engines operating with biomass-derived lemongrass oil biodiesel.

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Matrix Factorization Based Recommendation System using Hybrid Optimization Technique

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Abstract

In this paper, a matrix factorization recommendation algorithm is used to recommend items to the user by inculcating a hybrid optimization technique that combines Alternating Least Squares (ALS) and Stochastic Gradient Descent (SGD) in the advanced stage and compares the two individual algorithms with the hybrid model. This hybrid optimization algorithm can be easily implemented in the real world as a cold start can be easily reduced. The hybrid technique proposed is set side-by-side with the ALS and SGD algorithms individually to assess the pros and cons and the requirements to be met to choose a specific technique in a specific domain. The metric used for comparison and evaluation of this technique is Mean Squared Error (MSE).

Keywords: matrix factorization, ALS, SGD, optimization, recommendation system, latent factor, collaborative filtering.

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1. Introduction

There's an explosive growth of information in the present world, giving a tough time to find information that is appropriate from a tremendous amount of data present online. The data required obtained becomes mystical on the internet [3] [7]. So, we rely highly on recommendations [22]. A recommender system comes under the family of knowledge filtering systems whose main cause is a prediction [11] of the user's rating values to an item and thus drawing the interests of the user from the available data. Recommendation systems are implemented in a wide range of areas, including news, movies, text mining, books, etc... Not every recommender system is capable of handling all kinds of situations. Recommender systems can be classified into two strategies. The first category is the content-based filtering approach responsible for creating a profile for every user or product to delineate its nature. Consider, for example, a movie profile that contains characteristics based on its genre, the cast and crew, the popularity of that movie, etc. Similarly, the profiles of users contain arithmetical information or answers to a suitable questionnaire. The profiles that eventuate can be utilized to map users with matching products through programs. The disadvantage of a content-based recommendation system is it is necessary to obtain external information which is very difficult to muster in practice [9].

Collaborative filtering (CF), which plays a crucial part in generating personalized recommendations, is an alternative strategy and also among the most traditional and striking recommendation algorithms [10][19]. CF inspects user dependencies and product relationships to identify new user-item associations [8][17]. It can be observed that in some scenarios, few CF systems determine items pairs that are similarly rated or harmonious users with a compatible history of purchasing or rating to infer foreign relationships between users and items with just the data about the history of users which

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Internet of Things and Deep Learning Enabled Elderly Fall Detection Model for Smart Homecare

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ABSTRACT Recently, the techniques of Internet of Things (IoT) and mobile communications have been developed to gather human and environment information data for a variety of intelligent services and applications. Remote monitoring of elderly and disabled people living in smart homes is highly challenging due to probable accidents which might occur due to daily activities such as falls. For elderly people, fall is considered as a major reason for death of post-traumatic complication. So, early identification of elderly people falls in smart homes is needed to increase the survival rate of the person or offer required support. Recently, the advent of artificial intelligence (AI), IoT, wearables, smartphones, etc makes it feasible to design fall detection systems for smart homecare. In this view, this paper presents an IoT enabled elderly fall detection model using optimal deep convolutional neural network (IMEFD-ODCNN) for smart homecare. The goal of the IMEFD-ODCNN model is to enable smartphones and intelligent deep learning (DL) algorithms to detect the occurrence of falls in the smart home. Primarily, the input video captured by the IoT devices is pre-processed in different ways like resizing, augmentation, and min-max based normalization. Besides, SqueezeNet model is employed as a feature extraction technique to derive appropriate feature vectors for fall detection. In addition, the hyperparameter tuning of the SqueezeNet model takes place using the salp swarm optimization (SSO) algorithm. Finally, sparrow search optimization algorithm (SSOA) with variational autoencoder (VAE), called SSOA-VAE based classifier is employed for the classification of fall and non-fall events. Finally, in case of fall event detected, the smartphone sends an alert to the caretakers and hospital management. The performance validation of the IMEFD-ODCNN model takes place on UR fall detection dataset and multiple cameras fall dataset. The experimental outcomes highlighted the promising performance of the IMEFD-ODCNN model over the recent methods with the maximum accuracy of 99.76% and 99.57% on the multiple cameras fall and UR fall detection dataset.

INDEX TERMS Smart homecare, Smartphone, Fall detection, Artificial intelligence, Elderly people, Deep learning, Parameter tuning.

I. INTRODUCTION

In recent years, the Internet of Things (IoT) and mobile communication find useful in healthcare sector. With an enhanced healthcare system in several countries, average life span has developed considerably. Plus lower natural increases result in an elderly population that would need appropriate care and more interest. But, in several countries, offering appropriate care could be challenging because of several reasons. The impaired and elderly populations would shortly live in smart homes [1, 2]. These homes offer a pleasant and

ENHANCED EXPONENTIAL REACHING LAW-BASED SLIDING MODE CONTROL OF SHUNT ACTIVE POWER FILTER IN AN ELECTRICAL DISTRIBUTION SYSTEM

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ABSTRACT: In this work, a three-phase Shunt Active Power Filter (ShAPF) is proposed to address the current related issues in a three-phase Electrical Distribution System (EDS). A sliding mode controller (SMC) and an Enhanced Exponential Reaching Law-based SMC (EERL-SMC) are proposed for a ShAPF to compensate for the load current. The controller's performance is tested by injecting the current harmonics into the system. A non-linear load along with different loads on the distribution side is connected in parallel in a distribution network at the point of common coupling (PCC). Modelling of the system is done using state-space analysis. The stability of the system is analyzed using the state feedback approach. The reference source currents are generated using the instantaneous *PQ* theory. For variations in the load, the THD in the source current is realized. It is found that EERL-SMC is more effective for a ShAPF in reducing the high-frequency oscillations and settling time for convergence. The source voltage and current waveforms are observed to be sinusoidal. Both the controllers are effective in reducing the THD levels in the source current as per the IEEE standards. A comparison between the controllers is presented in terms of settling time, THD in source current. PSCAD v4.6 is used for simulation works.

Keywords: Electrical Distribution System (EDS); Shunt Active Power Filter (ShAPF); Point of Common Coupling (PCC); Total Harmonic Distortion (THD); Sliding Mode Controller (SMC); Enhancement Exponential Reaching law (EER-Law).

وحدة التحكم بالإنزلاق المبنية على قانون الوصول الأسي المحسن لمرشح القدرة الفعالة المتوازي في شبكة التوزيع الكهربائي

فيناي كومار ناغوبوينا[1] و ساتيش كومار جودي[2,*]

الملخص: يقدم هذه البحث مقترحا لاستخدام مرشح للقدرة الفعالة ذو ثلاثة أوجه تصفية لحل مشاكل شبكات توزيع الكهرباء ذات الثلاثة أوجه، كما يقترح استعمال وحدة التحكم بوضع الانزلاق بنسختيها العادية والمبنية على قانون الوصول الأسي المحسن لتعويض تيار الحمل في مرشح للقدرة الفعالة المتوازي ذو ثلاثة أوجه، حيث يتم اختبار اداء وحدة التحكم بحقن النظام بتوافقيات التيار. تم توصيل حمل خطي وأحمال اخرى مختلفة بالتوازي في شبكة توزيع الكهرباء عند نقاط الربط المشتركة، ووضع نموذج النظام عن طريق التمثيل المصفوفي للمعادلات التفاضلية، كما تم تحليل استقرار النظام عن طريق نهج التغذية الراجعة للحالة، ويتم انشاء تيارات المصدر المرجعي باستخدام النظرية المعممة للقوة التفاعلية اللحظية في الدوائر ثلاثية الطور، كما تحقق تشوه توافقي كلي في التيار المصدري نتيجة لاختلاف الحمل. اشارت نتيجة الدراسة الى ان وحدة التحكم بالانزلاق المبنية على قانون الوصول الأسي المحسن تعطي تأثيرا اكبر في تقليل ذبذبات التردد العالي وزمن السكون في مرشح القدرة الفعالة ذو ثلاثة أوجه، كما لوحظ أن جهد المصدر وأشكال موجة التيار هي جيبية بطبيعتها. نجح كلا من وحدتي التحكم بالانزلاق في تقليل التشوه التوافقي الكلي في مصدر التيار كما ورد في معايير معهد مهندسي الكهرباء والإلكترونيات. كما تم في هذه الورقة عرض مقارنة بين نوعي وحدات التحكم بالانزلاق وُضح من خلالها زمن السكون والتشوه التوافقي الكلي في مصدر التيار.

الكلمات المفتاحية: شبكة توزيع الكهرباء؛ مرشح التوازي للقدرة الفعالة ذو ثلاثة أوجه ؛ نقاط الربط المشتركة؛ وحدة التحكم بالإنزلاق؛ تشوه توافقي.

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Can Skeletal Joint Positional Ordering Influence Action Recognition on Spectrally Graded CNNs: A Perspective on Achieving Joint Order Independent Learning

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ABSTRACT 3D skeletal based action recognition is being practiced with features extracted from joint positional sequence modeling on deep learning frameworks. However, the spatial ordering of skeletal joints during the entire action recognition lifecycle is found to be fixed across datasets and frameworks. Intuition inspired us to investigate through experimentation, the influence of multiple random skeletal joint ordered features on the performance of deep learning systems. Therefore, the argument: can joint order independent learning for skeletal action recognition practicable? If practicable, the goal is to discover how many different types of randomly ordered joint feature representations are sufficient for training deep networks. Implicitly, we further investigated on multiple features and deep networks that recorded highest performance on jumbled joints. This work proposes a novel idea of learning skeletal joint volumetric features on a spectrally graded CNN to achieve joint order independence. Intuitively, we propose 4 joint features called as quad joint volumetric features (QJVF), which are found to offer better spatio temporal relationships between time series joint data when compared to existing features. Consequently, we propose a Spectrally graded Convolutional Neural Network (SgCNN) to characterize spatially divergent features extracted from jumbled skeletal joints. Finally, evaluation of the proposed hypothesis has been experimented on our 3D skeletal action KLHA3D102, KLYOGA3D datasets along with benchmarks, HDM05, CMU and NTU RGB D. The results demonstrated that the joint order independent feature learning is achievable on CNNs trained on quantified spatio temporal feature maps extracted from randomly shuffled skeletal joints from action sequences.

INDEX TERMS Human action recognition, 3D motion capture, spectrally Graded CNNs, skeletal joint ordering.

I. INTRODUCTION

The Skeletal based action recognition is being practiced through deep learning on features extracted from 3D joint sequences. These sequences represent joint positions across a 3D action video. However, the quality of these sequences depends entirely on the capturing technologies. Two most widely used 3D human action skeleton recording systems are Microsoft Kinect and motion capture. Kinect is commercially affordable with a moderate reliability in capturing human

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Identifying the presence of bacteria on digital images by using asymmetric distribution with k-means clustering algorithm

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Abstract

This paper is mainly aimed at the decomposition of image quality assessment study by using Three Parameter Logistic Mixture Model and k-means clustering (TPLMM-k). This method is mainly used for the analysis of various images which were related to several real time applications and for medical disease detection and diagnosis with the help of the digital images which were generated by digital microscopic camera. Several algorithms and distribution models had been developed and proposed for the segmentation of the images. Among several methods developed and proposed, the Gaussian Mixture Model (GMM) was one of the highly used models. One can say that almost the GMM was playing the key role in most of the image segmentation research works so far noticed in the literature. The main drawback with the distribution model was that this GMM model will be best fitted with a kind of data in the dataset. To overcome this problem, the TPLMM-k algorithm is proposed. The image decomposition process used in the proposed algorithm had been analyzed and its performance was analyzed with the help of various performance metrics

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Hindawi

Research Article

Structural Classification of Basalt FRP at High Temperatures

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In this study, two different temperatures are considered to verify the mechanical response of basalt fiber-reinforced polymer specimens. Initially, fibers are subjected to 300°C temperature for 4 hours and 600°C temperature for 2 hours in an electrical muffle furnace effectively. Later, laminates were prepared with these fibers and machined into test strips to verify their mechanical properties by conducting tensile and flexural tests. These laminates were compared with specimens prepared with normal fibers, i.e., fibers without temperature treatment. Moreover, the ductility and elastic behavior of the basalt fiber-laminated specimens are studied to figure out the possible structural applications. The residual stress of specimens subjected to 300°C temperature under tensile loading is about 84%, whereas for 600°C temperature, it is only 13% of maximum stress. A similar trend has been observed for specimens tested under flexural loading condition. Hence, it is concluded that the basalt fiber-reinforced polymer laminate can withstand and depict satisfactory results up to 300°C elevated temperature irrespective of time.

1. Introduction

Ductility is the capacity of a structural member to undertake large inelastic deformations without notable loss of strength or stiffness. Due to ductility, structures or materials can absorb energy by deforming into an inelastic range under the application of force. In other words, it is the ability to withstand plastic deformation before fracture which can be defined as the ratio of the ultimate deformation at an assumed collapse point to the yield deformation. For resistance to earthquake forces, the structure, elements, and connections shall be designed to have ductile failure to avoid sudden collapse. However, ductility is hard to achieve in many structural members such as deep beams, pile caps, and corbels. Since such members tend to fail mostly in the shear mode, the assumptions of the linear-elastic flexural theory and pure bending theory are not valid. These members require special considerations for design and detailing. Therefore, in order to achieve ductility, many design methodologies like Strut-and-Tie model and materials such as admixtures, plasticizers, and fibers are adopted. Moreover, with the increase in fire-related disasters around the world, the importance of fire-resistant construction is escalating.

In recent decades, many researchers [1–11] have studied the properties and applicability of basalt fiber in structural members due to its high temperature resistance, high durability, high elastic strength, sustainability, etc. It has been found that satisfactory mechanical and thermal-resistant properties of structural members can be achieved using chopped basalt fibers, basalt fiber-reinforced polymer (BFRP) bars, BFRP sheets, laminates, etc. However, contradictory findings are also available in the literature regarding the residual mechanical strength of basalt fibers subjected to elevated temperature conditions. Therefore, in this work, an attempt has been made to study the mechanical

Original Article | Published: 14 September 2021

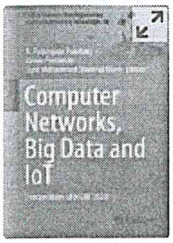
Enhancement in performance of DHTprecoding over WHT for EC companded OFDM in wireless networks

A. Lakshmi Narayana, B. Prasad, Prabhakara Rao Kapula, Dumpa Prasad, Asisa Kumar Panigrahy & D. N. V. S. L. S. Indira

Applied Nanoscience (2021)

Abstract

In this paper, a new hybrid methodology that combines precoding transform and companding transforms is being proposed for next-generation heterogeneous wireless networks. This method will improve the performance of the orthogonal frequency division multiplexing (OFDM) system by reducing the Peak to average power ratio (PAPR). A hybrid methodology that combines exponential companding (EC), which is a non-linear companding technique with Discrete Hartley Transform (DHT), as well as Walsh Hadamard Transform (WHT), is proposed and investigated. When the three simulated results are compared with original OFDM signal, piecewise linear companding shows an improvement factor of 28.8% over the original OFDM signal. Exponential



Computer Networks, Big Data and IoT pp 469–482

Challenging Data Models and Data Confidentiality Through "Pay-As-You-Go" Approach Entity Resolution

E. Laxmi Lydia, T. V. Madhusudhana Rao, K. Vijaya Kumar, A. Krishna Mohan & Sumalatha Lingamgunta

Conference paper | First Online: 22 June 2021

Part of the Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT,volume 66)

Abstract

Problem importance: Predictive analytics seems to be an exceptionally complex and vital concern in domains like computer science, biology, agriculture, business, and national security. When big data applications were indeed accessible, highly efficient cooperation processes are often meaningful. Simultaneously time, new subjective norms originate when the high quantities of data will conveniently assert confidential data. This paper has reviewed two complementary huge issues: data integration and privacy, the ER "pay-as-you-go"

Published: 09 September 2021

Wearable sensor based acoustic gait analysis using phase transition-based optimization algorithm on IoT

Sampath Dakshina Murthy Achanta, Thangavel Karthikeyan & R. Vinoth Kanna

International Journal of Speech Technology (2021)

Abstract

Gait monitoring with IOT has emerged as an important area of research because of the need of assessment of daily activities of patients and elder people. Ailments such as Parkin's stroke and the need of monitoring physically challenged persons in a crowd have been the driving force in the research of gait analysis. The evaluation of athletic performance is yet another area of application. Current measurement techniques rely on gait parameters, and the accuracy due to different gait-related occurrences is very restricted. Many sophisticated sensor-based gait patterns were established to keep the patient from falling and alerting in an emergency. The main objective of this research endeavour paper is to utilize phase transition based optimization in IOT environment for developing characteristic phases which maybe stable, unstable or Meta stable. The method

Chapter

Cloud-Based Smart Environment Using Internet of Things (IoT)

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Grand challenges for ambient intelligence and implications for design contexts and smart societies

Article Full-text available

Jan 2019

Norbert A. Streitz · Dimitris Charitos · Maurits Kaptein · Marc Böhlen

View Show abstract

Artificial intelligence and ambient intelligence

Computers, Materials & Continua
DOI:10.32604/cmc.2022.020110
Article

Tech Science Press

Deep Learning Based License Plate Number Recognition for Smart Cities

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Abstract: Smart city-aspiring urban areas should have a number of necessary elements in place to achieve the intended objective. Precise controlling and management of traffic conditions, increased safety and surveillance, and enhanced incident avoidance and management should be top priorities in smart city management. At the same time, Vehicle License Plate Number Recognition (VLPNR) has become a hot research topic, owing to several real-time applications like automated toll fee processing, traffic law enforcement, private space access control, and road traffic surveillance. Automated VLPNR is a computer vision-based technique which is employed in the recognition of automobiles based on vehicle number plates. The current research paper presents an effective Deep Learning (DL)-based VLPNR called DL-VLPNR model to identify and recognize the alphanumeric characters present in license plate. The proposed model involves two main stages namely, license plate detection and Tesseract-based character recognition. The detection of alphanumeric characters present in license plate takes place with the help of fast RCNN with Inception V2 model. Then, the characters in the detected number plate are extracted using Tesseract Optical Character Recognition (OCR) model. The performance of DL-VLPNR model was tested in this paper using two benchmark databases, and the experimental outcome established the superior performance of the model compared to other methods.

Keywords: Deep learning; smart city; tesseract; computer vision; vehicle license plate recognition

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Tech Science Press

Deep Learning with Backtracking Search Optimization Based Skin Lesion Diagnosis Model

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Abstract: Nowadays, quality improvement and increased accessibility to patient data, at a reasonable cost, are highly challenging tasks in healthcare sector. Internet of Things (IoT) and Cloud Computing (CC) architectures are utilized in the development of smart healthcare systems. These entities can support real-time applications by exploiting massive volumes of data, produced by wearable sensor devices. The advent of evolutionary computation algorithms and Deep Learning (DL) models has gained significant attention in healthcare diagnosis, especially in decision making process. Skin cancer is the deadliest disease which affects people across the globe. Automatic skin lesion classification model has a highly important application due to its fine-grained variability in the presence of skin lesions. The current research article presents a new skin lesion diagnosis model i.e., Deep Learning with Evolutionary Algorithm based Image Segmentation (DL-EAIS) for IoT and cloud-based smart healthcare environments. Primarily, the dermoscopic images are captured using IoT devices, which are then transmitted to cloud servers for further diagnosis. Besides, Backtracking Search optimization Algorithm (BSA) with Entropy-Based Thresholding (EBT) i.e., BSA-EBT technique is applied in image segmentation. Followed by, Shallow Convolutional Neural Network (SCNN) model is utilized as a feature extractor. In addition, Deep-Kernel Extreme Learning Machine (D-KELM) model is employed as a classification model to determine the class labels of dermoscopic images. An extensive set of simulations was conducted to validate the performance of the presented method using benchmark dataset. The experimental outcome infers that

Soft Computing – A Fusion of Foundations, Methodologies and Applications

RESEARCH-ARTICLE

Gait-based person fall prediction using deep learning approach

Authors: Achanta Sampath Dakshina Murthy, Thangavel Karthikeyan, R. Vinoth Kanna

Authors Info & Claims

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Abstract

ABSTRACT

Technology development and digital techniques provide wide opportunities to develop automatic systems. With the help of automated assessment systems, fall prediction for elders or persons with walking disabilities can be identified. Instead of conventional manual video assessment, the prediction accuracy can be improved if the person's gait model is analyzed. Various gait analysis models are evolved in the recent era that uses support vector machine, artificial neural network, work proposed a gait-based fall prediction model using a deep learning approach and identifies

1174: Futuristic Trends and Innovations in Multimedia Systems Using Big Data, IoT and Cloud Technologies (FTIMS)
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Hyperparameter search based convolution neural network with Bi-LSTM model for intrusion detection system in multimedia big data environment

Irina V. Pustokhina, Denis A. Pustokhin, E. Laxmi Lydia, Puneet Garg, Amarender Kadian & K. Shankar

Multimedia Tools and Applications **81**, 34951–34968 (2022)

Abstract

In recent years, there is an exponential increase in the growth of the multimedia data, which is being generated from zettabyte to petabyte scale. At the same time, security issues in networks, Internets and organizations are also continues to increase. The process of finding intrusions in such a big data environment is not easier. Different types of intrusion-detection system (IDS) have been presented for diverse kinds of networking attacks, however, many models could be identified unknown attacks. Deep learning (DL) approaches lately employed to large-scale big data analysis for effectual outcome. In this view, this paper presents a new deep learning based hyperparameter search

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RESEARCH ARTICLE OPEN ACCESS

Effect of lamination schemes on natural frequency and modal damping of fiber reinforced laminated beam using Ritz method

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Abstract. The current study focussed on analysing natural frequency and damping of laminated composite beams (LCBs) by varying fiber angle, aspect ratio, material property and boundary conditions. Ritz method with displacement field based on the shear and normal deformable theory is used and the modal damping is calculated using modal strain energy method. Effects of symmetric angle-ply and cross-ply, anti symmetric cross-ply, balanced and quasi-isotropic lay up schemes on modal damping are presented for the first time. Results revealed that influence of lay-up scheme on natural frequencies is significant for the thin beams while the modal damping of the thin beams are not sensitive to lay-up scheme. However, the lay-up scheme influences the damping significantly for the thick beams. Similarly, high strength fiber reinforced LCBs have higher natural frequency while low strength fiber reinforced LCBs have higher damping due to the better fiber-matrix interaction.

Keywords: Ritz method / free vibration / damping / aspect ratio / LCB

1 Introduction

Fibre reinforced laminated structures are always in demand because of high strength and very less weight. The laminated composite beam is a very common structural element used in various engineering applications such as mechanical, automobile, marine and aircraft industries [1]. The structures made of laminated composite materials have higher damping compared to conventional metallic structures due to the filler-matrix interaction [2]. Rajesh and Jeyaraj [3] through experiments demonstrated that, for a fibre reinforced composite beam, modal damping is influenced by nature of reinforcement. Senthilkumar et al. [4] shown that fibre length and its content influences the natural frequency of LCB significantly.

Various theorems presented by several researchers to analyze the free vibration frequencies of LCBs, using numerical and analytical methods, are recently reviewed by Sayyad and Ghugal [5]. Vo et al. [6] presented a shear and normal deformation model to analyse natural frequencies of LCBs using Ritz method. Nguyen et al. [7] formulated a unified model to study the static and dynamic behaviours of LCBs using Ritz method based on different theorems. Jeyaraj et al. [8] analysed sound radiation behaviour of a laminated composite plate using finite element method and found that increase in modal damping significantly reduces the vibration response at the resonances. Eltaher and Mohamed [9] studied stability characteristics of composite sandwich beams using differential quadrature method. Li et al. [10] used a unified higher order theorem based method to analyse natural frequencies of LCBs under the axial compression load. Nguyen et al. [11] presented an analytical model for the analysis of static and dynamic behaviours of LCBs using Ritz method.

Modal damping is capable of controlling vibration and sound levels when the system is excited at the resonant frequencies. Damping plays a vital role in the design of engineering components subjected to vibration and other dynamic loadings. Chandra et al. [12] presented a detailed study on damping of laminated composites and reported that modal strain energy method is used in general to estimate the damping theoretically. In aerospace applications, FRP composites are preferred due to higher inherent damping associated with it. The increase in inherent damping reduces the peak forced vibration responses significantly [13]. Ni and Adams [14] presented a method to

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Proceeding

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Patient-oriented approach in public health as a factor in the formation of a model of healthy behaviour (formation of sports lifestyle, introduction of individual physical activity)

ALEXEY VICTOROVICH SMYSHLYAEV[1] ✉ , ROMAN EVGENYEVICH PETROV[2], E. LAXMI LYDIA[3], HILARY IZUCHUKWU OKAGBUE[4], MARIYA VLADIMIROVNA MIKHAILOVA[5], RAFINA RAFKATOVNA ZAKIEVA[6]

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ABSTRACT

Currently, the introduction of the patient-oriented approach in healthcare is relevant in the framework of improving the quality and accessibility of medical care. The aim of the research was to study the conditions and principles of the formation of a patient-oriented model of a medical organization. The study used research materials in the field of patient-oriented treatment in healthcare. The main research method was content analysis. The patient-centred approach is based on eight principles: respect for consumer values; integrity of the medical diagnostic process; patient awareness; creation of comfortable conditions; providing emotional support; ensuring the continuity of the treatment process; ensuring access to medical care. The introduction of the patient-oriented approach may be hindered by a number of factors: an inflexible system of remuneration and linking the number of patients served to the level of remuneration. In addition, the key basic principle of the patient-oriented approach is to increase patient compliance and patient loyalty. Thus, when forming patient-oriented management in a medical organization, it is necessary to be guided in decision-making primarily by the interests of the patient. The introduction of the patient-oriented approach leads to increased commitment and loyalty of future patients. The development of a patient-oriented approach is also an important factor in strengthening public health (the formation of a sports lifestyle, the introduction of individual physical activity).
Keywords: Patient-oriented approach; Public health; Physical activity.

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IOS Press

An adaptive hello interval for AODV through ANFIS to improve the performance of MANETs

Kola Narasimha Raju[a,*], Aswadhati Sirisha[b], Uppe. Nanaji[c], S.K. Sharma[b] and Chatikam Raj Kumar[d]
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Abstract. Mobile Ad Hoc Network is an easily deployable wireless network without any need of centralized infrastructure. The change of position by wireless devicesleadstolinkfailuresandroutefailures.The mobile nodes sent hello messages at regular intervals to update the status of their neighbors. Increasing the number of periodical notifications such as hello messages will give an idea about the topology and at the same moment consumes more network resources. Reducing these periodic notifications results in discovering the neighbors at veryslowrate.Thereforetherateofhellomessages has most significant role while considering the performance of MANETs. Routing Protocols such as AODV in MANETs performs the operation basing on static hello interval. In this paper an adaptive hello interval approach is proposed based on a soft computing technique "Adaptive Neuro Fuzzy Inference system" for in MANETs. The result states that the proposed solution yields a great improvement over the traditional protocol "AODV".

Keywords: AODV, ANFIS, ANFISHIAODV, hello message, MANET, performance

1. Introduction

An exchange of information takes place through a guided or unguided media. The infra structure based network and infrastructure-less network are the two primary categories of a wireless communication (unguided media). In a centralized administrative network, the devices establish communication with one another depending on the fixed infrastructure. The centralized static structure restricts the adaptability and rapid deployment of the system.

A self configured structure is a decentralized structure which provides communication through a multihop process. This can be effectively used in the situations such as-sudden disaster recovery and emergency situations. MANET [1] is an easily deployable network containing mobile devices without any dependency on centralized infrastructure. Nodes in this network move arbitrarily changing from one location to another location which leads to frequent link failures and Route failures. Routing [2] is a major challenging issue in this type of structures. Routing protocols use different techniques to establish a way from an origin to destination.

1.1. Routing protocols in MANETs

A routing protocol [3,4] specifies how routers have to establish a communication path for the transmission of data. The routing strategies in

MANETs are proactive routing protocol, reactive and hybrid routing protocols.

Proactive routing protocols continuously monitor the network status and update the topology information fre-

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ORIGINAL PAPER

Check for updates

Performance investigation of multifunctional grid connected PV interleaved inverter with power quality enhancement

Vijayakumar Gali[1] · Madisa V. G. Varaprasad[2] · Sunil Kumar Gupta[1] · Manoj Gupta[1]

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Abstract

Design and hardware prototype development of interleaved inverter in the laboratory for photovoltaic applications is discussed in this paper. Conventional voltage source inverter (VSI) is suffering with shoot-through problems which lead to electromagnetic interference (EMI), temperature rise in power electronic devices, ringing effect, etc. To eliminate these problems, interleaved inverter topology is proposed in this paper. This topology works with control technique to perform multifunctional operation in order to enhance the system efficiency. The control strategy is distributed into two parts, one is to enhance the power harvesting from PV array using maximum power point tracking (MPPT) algorithm. Second one is self-charging of DC-link voltage control loop with double band hysteresis current controller (DBHCC). The self-charging DC-link voltage control loop generates the reference current signal for mitigating current related power quality problems and DBHCC offers lower switching frequency, therefore low switching losses. A MATLAB®/Simulink software is used for implanting the proposed system. A rigorous simulation study has been carried out to verify the multi-functionality and ruggedness of the proposed system. A laboratory prototype is developed using TMS320F28027 DSP controller to validate the simulation results. The test results show that the proposed system is performing multifunctional operation by injecting active power to the grid during day time and mitigate the PQ problems during the night time effectively without shoot-through problems.

Keywords Effect of dead time · Grid connected photovoltaic inverters · Multifunctional inverters · Power quality · Voltage source inverter · Shoot-through problems

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< Previous

Abstract

Earlier identification of brain tumor (BT) is essential to increase the survival rate of the patients. The commonly used imaging technique for BT diagnosis is magnetic resonance imaging (MRI). Automated BT classification model is required for assisting the radiologists to save time and enhance efficiency. The classification of BT is difficult owing to the non-uniform shapes of tumors and location of tumors in the brain. Therefore, deep learning (DL) models can be employed for the effective identification, prediction, and diagnosis of diseases. In this view, this paper presents an automated BT diagnosis using rat swarm optimization (RSO) with deep learning based capsule network (DLCN) model, named RSO-DLCN model. The presented RSO-DLCN model involves bilateral filtering (BF) based preprocessing to enhance the quality of the MRI. Besides, non-iterative grabcut based segmentation (NIGCS) technique is applied to detect the affected tumor regions. In addition, DLCN model based feature extractor with RSO algorithm based parameter optimization processes takes place. Finally, extreme learning machine with stacked autoencoder (ELM-SA) based classifier is employed for the effective classification of BT. For validating the BT diagnostic performance of the presented RSO-DLCN model, an extensive set of simulations were carried out and the results are inspected under diverse dimensions. The simulation outcome demonstrated the promising results of the RSO-DLCN model on BT diagnosis with the sensitivity of 98.4%, specificity of 99%, and accuracy of 98.7%.

Wireless Personal Communications
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Generative Adversarial Networks with Quantum Optimization Model for Mobile Edge Computing in IoT Big Data

Inderjeet Kaur[1] · E. Laxmi Lydia[2] · Vinay Kumar Nassa[3] · Bhanu Shrestha[4] · Jamel Nebhen[5] · Sharaf Malebary[6] · Gyanendra Prasad Joshi[7]

Accepted: 23 June 2021

Abstract
In present times, a massive quantity of big data has been generated by the Internet of Things (IoT) devices for a wide range of applications. The IoT devices generate an enormous data quantity that is troublesome for data processing and analytics functionalities, which is effortlessly managed by the cloud before the explosive development of the IoT. Specifically, the big IoT data analytics by mobile edge computing (MEC) becomes a hot research topic and needs comprehensive research works for intelligent decision making. This paper introduces a new generative adversarial network (GAN) with a quantum elephant herd optimization (QEHO) algorithm for MEC in IoT enabled big data environment called GAN-QEHO. The presented GAN-QEHO algorithm follows two-stage processes, namely feature selection (FS) and data classification. The QEHO algorithm is used to elect an optimal feature subset for the FS process. By the quantization of elephant individuals, the search scope of feature space can be enhanced, and an optimal tradeoff has been attained among exploration and exploitation. Then, the GAN model is employed for the classification process to identify different class labels. In order to validate the experimental results analysis of the GAN-QEHO algorithm, a series of simulations take place in terms of diverse aspects.

Keywords Big data · IoT · Mobile edge computing · Deep learning · Feature selection

1 Introduction

Presently, the robust development of mobile networks and wireless technology intends to the deployment of diverse mobile applications as well as multimedia like video games, face detection, augmented reality, the medical sector, and natural language processing [1]. Moreover, these applications and facilities demand pervasive as well as efficient processing that are incompatible with tools because of the minimal resources. Mobile cloud computing (CC) is assumed to be the eminent solution that reports the constraints of Mobile Users

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RECENT TRENDS IN CIRCULAR POLARIZATION ANTENNAS WITH VARIOUS FEEDING STRUCTURE: A REVIEW

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WQPSO Method uses K-means-based Consensus Clustering in BigData

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Abstract

The consensus grouping expects to merge a few existing core segments into a coordinated set, which has generally been perceived for grouping heterogeneous and multi-source information. One can deduce from the strong and high-level performance of the usual grouping techniques draws by agreement in great consideration, and many efforts have been made to build this field. The K- means-based Consensus Clustering (KCC) changes the agreement grouping issue into a traditional K- means clustering with hypothetical backings and shows the favorable circumstances over the cutting edge techniques. Even though KCC acquires the benefits of K- means, it experiences assignment instantly. Also, the current system of aggregating arrangements isolates age and the combination of essential segments into two unrelated parties. To resolve the following two difficulties a Weighted Quantum Particle Swarm Optimization (WQPSO) with KCC is proposed. This paper proposes a WQPSO calculation with the weighted average of the best situation based on particle welfare estimates. Calculation WQPSO gives faster in the vicinity of mixing, the suites in a better harmony between the world and the neighborhood looking from the calculation so that it produces a great

Article

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Effect of graphite particulate on mechanical characterization of hybrid polymer composites

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Abstract

Quest for producing lightweight and biodegradable materials has encouraged researchers to replace synthetic fibers with natural fibers. Hence a study is made to investigate the effects of introducing secondary reinforcement (natural fibers), stacking sequence, and addition of graphite particles on the mechanical characteristics and water uptakes along with diffusivity of hybrid (glass\jute) composites. Different weight fractions of graphite particulates are incorporated into the epoxy to produce different samples having 4 plies for each sample by hand layup vacuum bagging method. The obtained specimens are subjected to various mechanical tests, water absorption tests as per the ASTM standards, and optical microscopy was used to study the fracture morphology of the samples. The results displayed that the properties are deteriorated a little with the addition of secondary reinforcement, however they have improved with the addition of graphite. E-Glass as skin layer and treated jute as core layer composite exhibits ameliorate tensile strength (201.5 MPa), compression strength (515.12 MPa), flexural strength (106.9 MPa), hardness (25 BHN). However highest impact energy of 26 J is

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A NEW RANKING APPROACH FOR FINDING OPTIMUM SOLUTION FOR IFTP OF TYPE-1

Indira Singuluri[1] and N. Ravishankar

ABSTRACT. In today's daily life situations TP we frequently face the situation of unreliability in addition to unwillingness due to various unmanageable components. To handle with unreliability and unwillingness multiple researchers have recommended the intuitionistic fuzzy (IF)delineation for material. So, here, we contemplate a fuzzy TP of type - 1 IFN's, i.e., availability and demand are TIFN's and costs are real numbers. We apply IFZPM and IFMODIM to find optimum solution of a IFTP of type-1 make use of proposed ranking function. The same existing method is applied to proposed ranking function is comparatively give the same result. A relevant numerical example is also included.

1. INTRODUCTION

The fuzzy set (FS) theory was initially invented by Zadeh [8] is helpful in many ways in different applications in various fields. The concept fuzzy mathematical programming was invented by Tanaka et al in 1947 framing of fuzzy decision of Bellman et al [2]. Concept of Intuitionistic fuzzy sets (IFS's) suggested by Atanassov [1] are mainly useful to deal with many exceptions, confusion and ambiguities. The IFS's separate the intensity of membership (MF)

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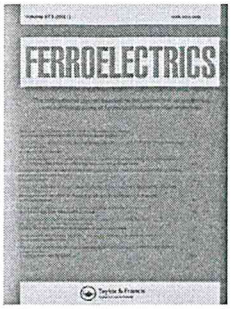

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Ferroelectrics

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Synthesis, structural and microstructural properties of CBN ferroelectric ceramics

B. Chandra Sekhar, B. Dhana Lakshmi, M. Ratna Raju, S. Ramesh, P.S.V. Subba Rao & B. Parvatheeswara Rao

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Synthesis and Analysis of Zirconium Titanate Thin Films by using Sol-Gel Method

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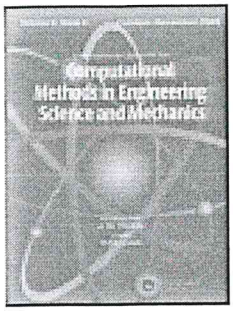
Abstract: Titanium-doped zirconium oxide (mixed high-k) has been used as the gate oxide layer for the future generation metal oxide semiconductor devices. This mixed high-k layer was prepared by using Sol-Gel based spin-coated method. This mixed high-k layer's chemical, structural, and initial electrical properties are investigated thoroughly. It is clearly confirmed that the suitable chemical composition and bond formation of the proposed mixed high-k layer from EDAX and FTIR analysis observations. The XRD spectra strengthened the presence of $ZrTiO_2$. The measured dielectric constant of the proposed mixed high-k layer from the extracted C-V plots has been varying from 29.1 to 37.6 with respect to spin coating from 4000 to 6000 rpm. With lower spin rates, the leakage current is less.

Keywords: zirconium titanate; ZTO; ULSI; gate capacitors; high-k dielectrics.

1. Introduction

The chemical composition of a proposed mixed thin film will have a major role in achieving a metal oxide semiconductor device's enhanced performance. Though there was rigorous research on various high dielectric (high-k) TiO_2, HfO_2, Y_2O_3, La_2O_3, Gd_2O_3, Ta_2O_5, STO, ZrO_2, Al_2O_3 monolayers, recently there is an intensive focus on the mixed high-k layers to replace the SiO_2 [1-14] to have the bidirectional benefits on various physical and electrical applications. Among various high-k materials, TiO_2 has a wide range of applications due to its physical and chemical properties. Its applications extend as a photocatalyst, solar cell, electrochromic devices, anti-reflection coating, sensors. Besides, TiO_2 can also be used as reliable high-k material for DRAM applications because of its higher dielectric constant [13-17]. ZrO_2 has gained considerable attention during the recent decade because of its high bandgap of ~5eV [18], large melting and boiling points, high crystallization temperature, high thermal stability, high dielectric constant [19-20].



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Prediction of global damage index of reinforced concrete building using artificial neural network

Pritam Hait , Arjun Sil & Satyabrata Choudhury

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A KEY EXCHANGE ALGORITHM WITH BINARY QUADRATIC FORMS TO DESIGN COMPLEX SECURITY FRAMEWORK

K. Vijaya Prasamsa[1], P. Anuradha Kameswari, K. Narasimha Raju, T. Surendra, and D. Mrudula Devi

ABSTRACT. A binary quadratic form $f(x,y)$ is a homogeneous polynomial $f(x,y) = ax^2 + bxy + cy^2$ of degree 2 denoted by (a,b,c) where the coefficients a,b and c are fixed integers and the variables x and y are restricted to integers. A binary quadratic form will possess it's equivalent form by the unimodular substitution. Therefore, computing the unimodular matrix used, from the equivalent form is difficult in general for the binary quadratic forms. This difficulty regarding the unimodular substitutions for computing the equivalent binary quadratic forms is another source for trapdoor functions in Public Key Cryptosystem. In this paper, we described how linear transformations of x and y variables can change one binary quadratic form into other form by a unimodular substitution in the key exchange cryptosystem and proposed a method for recovering the secret key in the key exchange system using binary quadratic forms.

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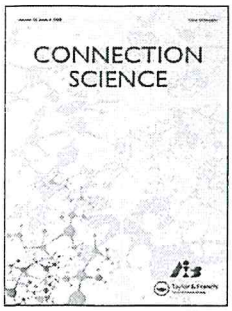

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Performance analysis of an improved forked communication network model

Sk. Meeravali, Debnath Bhattacharyya, N.Thirupathi Rao & Yu-Chen Hu

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Solution-based spin cast-processed O-shaped memory devices

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ABSTRACT

We have studied the current transport mechanism by investigating the hysteresis behavior of current–voltage characteristics obtained by solution-processed spin casting O-shaped memory devices made up with hybrid organic/inorganic nanocomposites of polyaniline–zinc oxide (PANI–ZnO) onto the indium tin oxide (ITO)-coated glass. The nanocomposites are characterized by Raman spectroscopy, FTIR, XRD, FE-SEM, and HR-TEM. The electrical characterization of the nanocomposites showed distinct *I–V* characteristics with large hysteresis. A hysteresis-type *I–V* characteristic represents O-shaped memory. The performance of hysteresis behavior remained constant, even after fifty operation cycles. Based on our investigation analysis, a chance of charge transport mechanism occurs, and our data analysis shows that a charge carrier transport mechanism occurs. A normalized differential conductance (NDC) also likely exists. The PANI–ZnO layers controlled the movement of the carriers, and the indium tin oxide–polyaniline–zinc oxide–aluminum (ITO–PANI–ZnO–Al) memory device shows a hysteresis-type current–voltage characteristic. It portrays a specific kind of memory devices with low-cost and low power consumption non-volatile memory applications.

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Simulation and experimental design of adaptive-based maximum power point tracking methods for photovoltaic systems

P. Srinivasarao [a], K. Peddakapu [b], M.R. Mohamed [b] ✉, K.K. Deepika [c], K. Sudhakar [d, e]

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Abstract

This paper presents a filter-based adaptive fuzzy proportional integral derivative (FPIDN) controller for photovoltaic (PV) systems. The proposed maximum power point tracking (MPPT) method is implemented in two blocks. The first block represents by an adaptive calculation block; to produce a reference voltage for every maximum power point (MPP), whereas the second is the FPIDN controller; utilized to manage duty cycle of the PWM converter. The effectiveness of the proposed MPPT has been evaluated to different MPPT methods. The efficiency of the proposed MPPT recorded at 99.45% and 99.72% with MPP capture time clocks at 0.048s, outperforms the benchmarked traditional MPPT methods under diverse irradiance and temperature conditions.

Graphical abstract

Wireless Networks
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SSK modulated WPCN with Euclidean distance based selection combining receiver

Hemanta Kumar Sahu[1]

Accepted: 12 October 2020

Abstract
In this paper, the performance of space shift keying (SSK) modulation in a wireless-powered communication network (WPCN) is analysed with selection combining based on generalized Euclidean distance at the receiver. The network considered here is with multiple number of transmitting antennas and multiple number of receiving antennas operates under Rayleigh fading. Based on the Euclidean distance between the SSK modulation constellation points, this scheme selects any number of antennas out of N_a receiving antennas. Selecting one or N_r ($N_r < N_a$) number of receiving antennas with energy harvesting, the system performance will improve and the receiver complexity as well as the number of radio frequency (RF) chains can be reduced. A closed form expression for the average bit error probability (ABEP) is derived for two transmitting antennas and N_a receiving antennas with WPCN using SSK modulation. The numerical results and simulation results are presented to illustrate the energy harvesting on system performance.

Keywords WPCN · SSK modulation · Fading channel · MIMO communication · Performance analysis

1 Introduction

The rapid increasing demands of data-rate and massive growth in multimedia traffic, trigger an upcoming technology for next-generation wireless communication. The advent of the internet of things (IoT) can improve the lifestyle by allowing the massive data-rate and less multimedia traffic friendly and economically [1]. However, an effective increase in the number of IoT devices, the vast demand for wireless communication has triggered a sharp rise in energy consumption. Energy harvesting for wireless communication is a solution to prolong the lifetime of energy constrained nodes like IoT and low power sensors terminals. Energy can be harvested from radio frequency (RF) signals radiated by ambient transmitters to power the user terminals wirelessly [2]. Wireless powered communication network (WPCN) technology is based on the fact that RF signals can carry both energy and information, and the energy constrained node can harvest energy from RF signals [3]. The recent technology like wireless sensor networks, wireless body networks, and radio-frequency identification networks are examples of WPCN. Therefore, WPCN is an alternative to conventional battery-powered wireless networks in some restricted conditions like production plants, battlefields, remote areas under surveillance, etc. The benefits of WPCN compared to conventional battery-powered networks are (a) stable power supply under different physical conditions (b) elimination of frequent replacement of battery (c) higher throughput (d) low operating cost (e) prolongation lifetime of devices [4, 5].

While WPCN supports energy harvesting [6–10], high data rate with low transmission complexity has been demonstrated by space shift keying (SSK) modulation [11]. In SSK modulation, out of N_t transmitting antennas, only a single antenna is activated at a time instant to transmit the information [12]. Thus, SSK modulation avoids some problems like inter-channel interference (ICI), inter antenna synchronization (IAS), and the number of RF chains which are associated with multiple-input-multiple-output (MIMO) communication [13]. Transmission of antenna index mapped to data bits simplifies the

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Assessment of young's modulus of alkali activated ground granulated blast-furnace slag based geopolymer concrete with different mix proportions

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Young's modulus

ABSTRACT

To Prepare the Eco-friendly concrete we require alkali solutions like Sodium hydroxide and sodium silicate. Organize the alkali solutions, by taking into consideration of dissimilar molarities of Sodium hydroxide (NaOH) resembling 9 M, 14 M, and 19 M and dissimilar concentrations of sodium silicate (Na_2SiO_3) resembling 20%, 35%, and 50%. Get ready the alkali-solution of NaOH & Na_2SiO_3 alone 1 h earlier to the combination of Geopolymer Concrete. The result shows the mechanical properties such as compressive strength, young are modulus and density of Geopolymer Concrete. The specimens be hardened after 28 days of ambient curing. The investigational result shown that mix proportion of 1:1:2 mix produces compressive strength and Young's Modulus values.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

Now a day's environment pollution is more due to construction industries, these industries uses cement as a major product, due to cement, carbon dioxide more in atmosphere, in order to reduce carbon dioxide, industrial waste like GGBS, Flyash etc., is used in construing industry. In GP concrete, alkaline liquids are used for the geo-polymerization. It is a mixture of SH & SS or potassium hydroxide & potassium silicate. Both are having same properties. Silica and alumina reserves are more soluble in SH solution and hence these are adopted in this study cubes and cylinders were cast with mixing ratio of GGBS 80% & Silica fume 20%/fine aggregate/Coarse aggregate 1:1:2 respectively. Mortar cubes of different molarities like 2 M, 4 M, 7 M, 9 M, 12 M, 14 M, 16 M, 19 M was tested in laboratory, based on observation, compare to all molarities 9 M, 14 M, & 19 M molarities were used throughout this research. Figs. 1–20

During casting time So many literature reviews suggest that SH will take time to control the heat for 24 h, but as per present observation, there is no strength variation for dissolves NaOH in one hour and 24 h. But during the mix time it generates some heat, but small precautions are sufficient to control the heat.

GPC is an inventive and environmental organization material affected by the substitution of normal PC. GP knowledge was first imaginary by J DEVIDOVITS in the 1978 and distinct it is seeing that alkali activated substance. Appropriate toward this GP is micro porous, alumino-silicate mineral in the main use as cost-effective adsorbent and reagent. GP substance symphony is comparable to zeolite. Due to micro porous constitution, concert of GP is temperature reliant.

Vijaya et al. [1] studied the behavior of concrete by partially replacing the cement with flyash, rice husk ash and silica fume. Srinivas et al. [2] investigated the behavior of concrete with ceramic and granite waste as coarse aggregate. Priyanka et al. [3] established the need for rural road development using QGIS and its estimation. Padmakar et al. [4] studied about the characteristic compressive strength of a geo-polymer concrete. George et al. [5] investigated the growth and photoluminescence study of nickel sulfate doped zinc tris- thiourea sulfate (ZTS) crystal. Padmakar et al. [6] designed a novel mix for rigid pavement by using recycled aggregate with the addition of admixture. Srinivas et al. [7] studied the effect of alkaline activators on strength properties of metakaolin and flyash based geopolymer concrete. Barhmaiah et al. [8] conducted a peak hour analysis and effect of traffic composition on

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Computer aided seismic analysis and design of a G + 10 multistoried residential structure

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Flexibility matrix
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ABSTRACT

In general, a structure is to be designed resistant to the sudden and natural disasters. So, in order to compete in the ever-growing global market, a structural engineer should be precise in his work considering all the possible loads that show an impact in the behavior of a building when it is prone to sudden loading. So, this project is an attempt to analyze and design a G + 10 multi storied building by taking into consideration all types of loading such as dead load, live load, wind load and especially seismic loads. The analysis is performed using conventional methods like moment distribution method, flexibility matrix method and a computer aided software called STAAD Pro. The design of the multistoried structure is done using the Indian Standard Code IS 456. The load consideration is as follows; dead and live loads are taken as per the design regulations in IS 875 Part-I and II respectively, the wind loads are considered as per IS 875 Part-III and the seismic loads are taken as per IS 1893:2016. The analysis of the structure using STAAD Pro software involves modeling and defining the structure and as the result, parameters like shear force, bending moment and deflection are obtained. The results obtained in the analysis of the structure by using both software and manual calculations are compared, and the design is performed for the maximum obtained results.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

1.1. General

Structural engineering is the emerging and very crucial field of construction industry. So a structural engineer should be very accurate in designing the structures. Among all the loads that have to be considered earthquake loads that occur in a multistoried building may result in severe change of a structure. The severity of damage of the structure also depends on the height of the structure so, seismic analysis of a structure considering all types of loads for any height of the building is crucial for construction of a multistoried structure.

Vijaya et al. [1] studied the behavior of concrete by partially replacing the cement with flyash, rice husk ash and silica fume. Srinivas et al. [2] investigated the behavior of concrete with ceramic and granite waste as coarse aggregate. Priyanka et al. [3] established the need for rural road development using QGIS and its estimation. Padmakar et al. [4] studied about the characteristic compressive strength of a geo-polymer concrete. George et al. [5] investigated the growth and photoluminescence study of nickel sulfate doped zinc tris- thiourea sulfate (ZTS) crystal. Padmakar et al. [6] designed a novel mix for rigid pavement by using recycled aggregate with the addition of admixture. Srinivas et al. [7] studied the effect of alkaline activators on strength properties of metakaolin and flyash based geopolymer concrete. Barhmaiah et al. [8] conducted a peak hour analysis and effect of traffic composition on capacity of arterial roads. Padmakar [9] conducted a pushover analysis on steel frames. Singh et al. [10] conducted a case study and analyzed the two wheeler characteristics at signalized intersection under mixed traffic conditions. Singh et al. [11] conducted

Abbreviations: RCC, Reinforced cement concrete; M25, Grade of concrete; Fe415, Grade of steel; V_b, Basic wind speed; K_1, Risk Coefficient; K_2, Height and terrain factor; K_3, Topography factor; K_4, Importance factor for cyclonic region; Pz, the design wind pressure; Vz, the design wind speed; Q_i, Design lateral force at floor i; W_i, Seismic weight of floor i; h_i, Height of floor i measured from base; N, Number of storeys in the building; V_B, Design Base shear.

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Reliability analysis of doubly Reinforced Concrete Beams retrofitted by plate bonding

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Abstract: This paper concerns the safety of the simply supported reinforced concrete beams subjected to only bending loads: so that the reliability index and probability of failure are to be calculated. Reliability index was carried out by using Hasofer-Lind method for the doubly reinforced beam with and without retrofitted beams having externally bonded plates (porous and solid) with variable thickness for the limit state in bending. Reliability index can be calculated by using MS-EXCEL. The reliability index for control beam is 0.4022 and the FR-A4 beam is 3.9791. So, the reliability index is high for retrofitted beam only. The Probability of failure (3.5E-05) for FR-C4 beam is very low under the combination of porous plate and 3mm plate thickness.
Keywords: Reinforced concrete beams, Retrofitting, Plate bonding, Bending, Reliability analysis, Limit state function, AFOSM, Reliability Index, Probability of failure.

1. Introduction

1.1 General

Reliability-based techniques have been used broadly in structural engineering. This approach allows designers to realistically assess the possibility of structural failure. It involves the use of probability and definition of a safety index to achieve a balance between safety and cost. Evaluation of structural safety related to the design procedure for reinforced concrete beams in pure bending. The so-called reliability index method was also used to design reinforced concrete beams and structural steel members.

The performance of a structure is evaluated by its safety, serviceability, and economy. The information about input variables is never certain, precise, and complete. The sources of uncertainties may be (i) inherent uncertainty, i.e. physical uncertainty, (ii) limited data, i.e. statistical uncertainty, (iii) imperfect knowledge, i.e., model uncertainty, and (iv) gross errors. In the presence of uncertainties, the absolute safety of a structure is difficult due to (i) the unpredictability of (a) loads on a structure during its life, (b) in-place material strengths, and (c) human mistakes, (ii) structural inventions in forming the mathematical model of the structure to calculate its response or behaviour, and (iii) the limitations in numerical methods. Therefore, some risk of unacceptable performance must be tolerated. For the risk of life, structural safety is important. In the conventional deterministic analysis and design methods, it is assumed that all parameters (loads, strengths of materials, etc.) are not subjected to probabilistic variations. The safety factors provided in the existing codes and standards, primarily based on practice, decision, and understanding, may not be satisfactory and economical.

The concept of reliability has been applied to many fields and has been understood in many ways the most common meaning, and accepted by all, of reliability is that reliability is the probability of an item performing its intended function over a given period under the operating conditions encountered. It is

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Mechanical characterization of alkali activated GGBS based geopolymer concrete

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ARTICLE INFO

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Keywords:
Sodium hydroxide (NaOH)
Sodium silicate (Na_2SiO_3)
Modulus of elasticity

ABSTRACT

The mix of Geopolymer concrete (GPC) requires alkali solutions(AS) like Sodium hydroxide(SH), sodium silicate(SS). Manage the AS, by taking into reflection of unlike molarities of SH (NaOH) resembling 9 M, 14 M, and 19 M and unlike concentrations of SS (Na_2SiO_3) similar to 20%, 35%, and 50%. The alkali-solution of NaOH & Na_2SiO_3 kept separately for 1 h before to the combination of GPC. The result shows the mechanical properties(MP) such as compressive strength(CS), young modulus(E) and density of GPC. The specimens were toughened following 28 days of ambient curing(AC). The trial result shown that mix proportion of 1:2:4 mixes produces CS and E values.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

1.1. General

Every day all are facing atmosphere contamination is high due to structure industries, in these mainly uses cement as a key manufactured good, due to cement, CO_2 heavily circulate in air, in order to prevent CO_2, industrial dissipate like Ground granulated blast furnace slag(GGBS), Flyash(FA) etc., were used as structural industry. In GPC, alkalis were used for the geo-polymerization. It is a combination of SH & SS or KOH, K_2SiO_3. These two combinations of alkalis were having equal properties. "Si" and "Al" reserves were more soluble in SH solution and therefore these were adopt in this study cubes and cylinders were cast with combining ratios of GGBS 80% & Silica fume(SF) 20% / fine aggregate/ Coarse aggregate 1:2:4 respectively. Mortar cubes of dissimilar molarities like 2 M, 4 M, 7 M, 9 M, 12 M, 14 M, 16 M, 19 M were tested in lab, based on watching, evaluate to all molarities 9 M, 14 M, & 19 M molarities were worn the whole time of this research.

Throughout casting moment So many literature reviews advise to SH is self-control the heat for 24 h, but based on the trails, strength does not varies for dissolves NaOH in one hour and 24 h. But throughout the mix time it transmits some heat, but minor safety measures were enough to manage the heat.

1.2. Geopolymer concrete

GPC is an ingenious and environmental association material affected by the exchange of common PC. GP information was first invented by J DEVIDOVITS in the 1978 and dissimilar it considering that alkali activated material. Suitable in the direction of this GP is micro porous, alumino-silicate mineral in the major use as cost-effective adsorbent and reagent. GP substance symphony is comparable to zeolite. Due to micro porous structure, concert of GP is temperature dependent (Table 1).

Vijaya et al. [1] studied the behavior of concrete by partially replacing the cement with flyash, rice husk ash and silica fume. Srinivas et al. [2] investigated the behavior of concrete with ceramic and granite waste as coarse aggregate. Priyanka et al. [3] established the need for rural road development using QGIS and its estimation. Padmakar et al. [4] studied about the characteristic compressive strength of a geo-polymer concrete. George et al. [5] investigated the growth and photoluminescence study of nickel sulfate doped zinc tris- thiourea sulfate (ZTS) crystal. Padmakar et al. [6] designed a novel mix for rigid pavement by using recycled aggregate with the addition of admixture. Srinivas et al. [7] studied the effect of alkaline activators on strength properties of metakaolin and flyash based geopolymer concrete. Barhmaiah et al. [8] conducted a peak hour analysis and effect of traffic composition on capacity of arterial roads. Padmakar [9] conducted a pushover analysis on steel frames. Singh et al. [10] conducted a case study and analyzed the two wheeler characteristics at signalized inter-

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Rehabilitation of distressed RC beams: A critical review

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Keywords:
Reinforced concrete beam
Repair
Rehabilitation
Finite element
ANSYS
Damaged structures

ABSTRACT

This article reviews research on various mechanisms of repairing damaged RC beams (Reinforced concrete). Structures in general, are designed depending on the function, structural and environmental conditions and other requirements. All structural members are designed for predefined requirements. Nowadays the majority of the aged civil structures need repairing for improving the strength, integrity, protection of reinforcement from weathering etc. In some cases, it is less expensive for maintaining the infrastructure at appropriate intermissions than to make a re-construction that will need a repair when exposed to harsh conditions for an extensive period. Numerous types of methods and materials are available for repair of aged/damaged structures. This paper deals with the review of various causes of structural distress and different techniques that are assessed for their efficiency both experimentally and analytically for repair and rehabilitation of RC beams.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

Reinforced concrete is the most widely used and the most versatile building construction material due to its durability and high strength. It is the one construction material available at a low cost that can be used in heavy structures including load-bearing walls. Many researchers are working to improve the performance of reinforced concrete structures under varying conditions. Developing countries are trying to prove that for better performance of it is important to use structures, quality materials and skilled labours for construction. Strength of RC elements decreases with age from the day of construction. So, proper periodic maintenance is required to retain structural properties during its design period. Engineers play an important role in analyzing the behaviour of structural elements for repair and in suggesting the proper rehabilitation method through proper inspection of its residual life.

The lifespan of an RC structure depends upon the positioning, soil, differential settlements, chemical attack, poor materials and technique of construction, change in loading, climate, wear and tear, regular repair and maintenance. However, in addition to above all, the structure is seriously affected by accidents like an earthquake, erosions due to flood and sea, Tsunamis, and cyclones etc. A typical description of the life span of a new structure is presented in Fig. 1.

RCC structures are posing a concern for civil engineers with a need for early repair, rehabilitation and retrofitting of theirprominent structural elements like columns, beams and slabs these are deteriorating earlyafter cracking and corrosion and even complete collapse and failure ([1 2 3]).

Assessing the totality as per CPWD (Central Public Works Department), GOI (Government of India), Codes and IS of practice; mapping of the damage and its extent of impairment, Choice of proper corrective propositions, the prophecy of the residual life for repairing measures, and monitoring the health of its components and the efficacy of the cost of the repair are some of the most important aspects of a rehabilitation project. High engineering knowledge, skill and expertise are essential for solving the issue

Abbreviations: FRP, Fiber Reinforced Polymer; SFRC, steel fibre jacketing; SFRP, Sprayed fibre reinforced polymer; HPFRC, High-Performance fibre reinforced concrete; GFRP, glass fibre reinforced plastic; CFRP, Carbon Fiber Reinforced Polymer; NDT, Nondestructive test; AAR, Alkali aggregate reaction; ASR, Alkali-Silica reaction.

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Study of activation energy for KDP crystals in etchants with citric and tartaric acids

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Keywords:
Etching
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Frequency factor
Citric acir
Tartaric aci
KDP crystals

ABSTRACT

Etching has created a great deal of interest amongst researchers and significant experiments have been conducted. Potassium Dihydrogen Phosphate (KDP) is among the most broadly utilized business NLO materials. They are normally utilized for multiplying, significantly increasing and quadrupling of Nd: YAG laser at room temperature. Moreover, they are additionally phenomenal electro precious stones - optic with high electro-optic coefficients, generally utilized as electro-optical modulators, Q-switches, and Pocket cells, and so on KDP was used in the growth of single crystals by gel method. The authors have successfully grown KDP crystals by solution method at ambient temperature. KDP single crystals were etched in an aqueous mixture of fuming nitric acid and tartaric/citric acid along with distilled water. Tetragonal well defined etch pits were observed.

The activation energies were calculated using Arrhenius law: -

$W = A \exp(-E/2kT)$

Where; W is the etch pit width and T the absolute temperature. It was observed that the structure of the etchants pronouncedly affects the enactment vitality. The details will be presented.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

Potassium dihydrogen orthophosphate, KH2PO4 (contracted as KDP) gems have a place with the scalenohedral (twelve sided polyhedron) class of tetragonal gem framework. The potential applications of KDP are: -

(a) Electro-optical modulator and Q switches
(b) Second, third, and fourth consonant age, recurrence multiplying of dyer laser
(c) Shutter for fast photography
(d) High power laser recurrence change materials

The factors that influence the reactivity of solids are of practical and fundamental importance. High, low or preferential reaction rates are sought in depending on circumstances and usage. The fundamental aspects can be understood by a systematic study of the factors on which the reaction rate depends and the corresponding mechanisms that take place. The understanding of the reactivity of crystalline structures has grown from an increasing knowledge of solid-state physics including the regular lattice structure and different lattice defects therein [1,2]. A systematic study of the activation energy of etch pits of KDP crystals, grown by solution method has been carried out and the results are presented.

Vijaya et al. [3] studied the behavior of concrete by partially replacing the cement with flyash, rice husk ash and silica fume. Srinivas et al. [4] investigated the behavior of concrete with ceramic and granite waste as coarse aggregate. Priyanka et al. [5] established the need for rural road development using QGIS and its estimation. Padmakar et al. [6] studied about the characteristic compressive strength of a geo-polymer concrete. George et al. [7] investigated the growth and photoluminescence study of nickel sulfate doped zinc tris- thiourea sulfate (ZTS) crystal. Padmakar

Abbreviations: KDP, Potassium Dihydrogen Phosphate; NLO, Nonlinear optical; W, Etch pit width; T, Absolute temperature; A, Recurrence factor, K, Universal gas constant; HNO3, Nitric acid; HCL, Hydrogen chloride.

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View article

Dakshayani himabindu

COMPARATIVE ANALYSIS OF DATA USING FUZZY LOGIC

Authors M Srinivasa Rao, Pasala Sandhya, D Dakshayani Himabindu, S Praveen Kumar

Journal Turkish Journal of Physiotherapy and Rehabilitation

Volume 32

Pages 3

Description Spatio-Temporal information has now pervaded the regular daily existence of the cutting edge world, from wellbeing information to securities exchange information. Handling this information requires particular techniques to guarantee that the forecast strategies unmistakably comprehend the basic segment of time. Perhaps the most well-known strategies related with Spatio-transient information is estimating, ie, anticipating values dependent on the recently known information in the time hub. This paper endeavors to bring fluffy frameworks into Spatio-fleeting information driven determining. Fluffy frameworks are subject to a part of science, Fuzzy Logic. It contains truth of different levels; instead of the one and zero plan of Boolean Logic, Fuzzy components can take regards some place in the scope of zero and one. Soft systems work commendably with missing or conflicting data to address the weakness present ...

CRIME INVESTIGATION THROUGH COLOUR SIMILARITY MEASURE

P. Sandhya, Ch . SwapnaPriya, M. S. Rao • Published 2021 • Sociology

Forensic scientists, involves in crime scene investigation, collects evidences, do laboratory tests and interprets result. They should have more colour vision because the defect will seriously hamper their responsibility in the respective roles. Importantly the histopathologists must possess good colour vision as their job involves interpretation of the crimes happened and it is a compulsory requisite. This article focuses on forensic colour vision and human perspective[1]. These people... Expand

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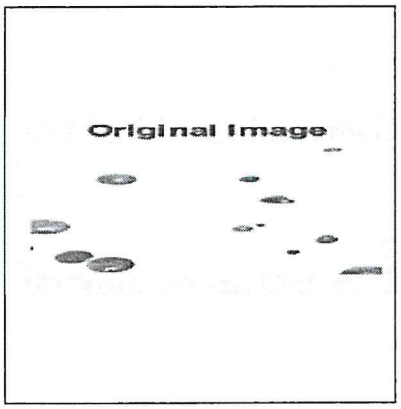

Figure 1

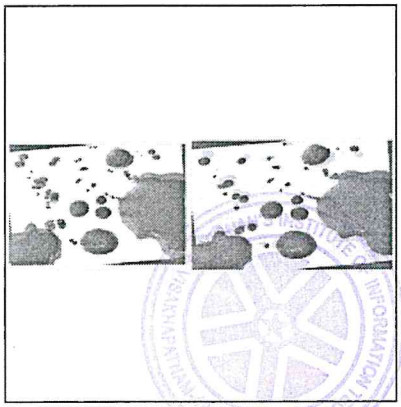

Figure 3

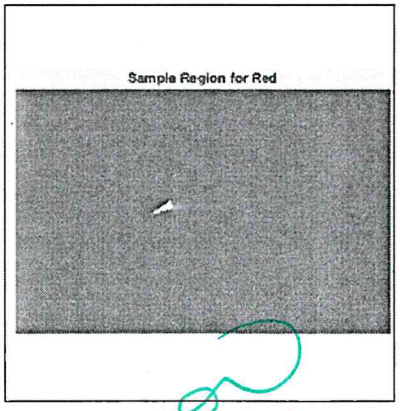

Figure 5

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AN ENHANCED METHOD FOR DETECTING FAKE NEWS USING MACHINE LEARNING

Palvi Rani, D. Mouli, Palla Sravani • Published 2021 • Computer Science

The problem of fake news has evolved much faster within the latest years. Social media has dramatically modified its attain and have an impact on as an entire . On one hand, it"s low cost, and convenient accessibility with speedy share of knowledge attracts greater interest of humans to read news from it. , it allows vast unfold of fake news, which are nothing however false data to deceive people. As a result, automating Fake information detection has emerge as mislead people. On the arious... Expand

Figures from this paper

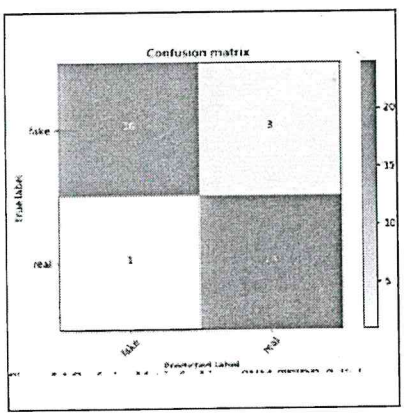

Figure 5.1

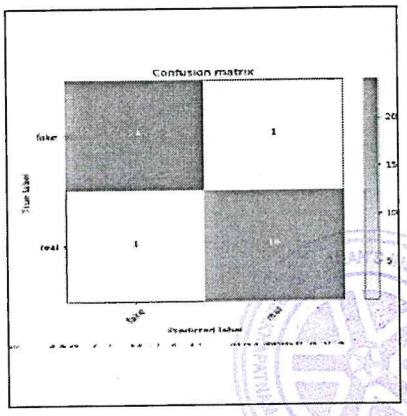

Figure 5.2

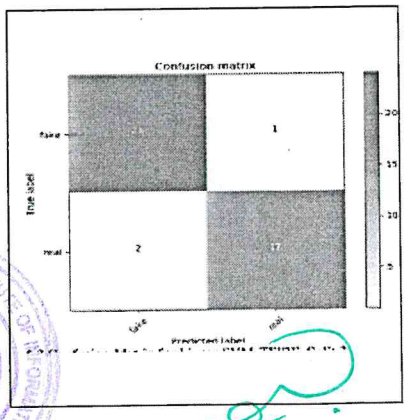

Figure 5.3

Turkish Journal of Physiotherapy and Rehabilitation; 32(3)
ISSN 2651-4451 | e-ISSN 2651-446X

"INSECTS AS EVIDENCE" RETRIEVAL OF TIME OF DEATH BASING ON FORENSIC ENTOMOLOGY THROUGH DIGITAL IMAGING

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[2]*Research Scholar, Computer Science Engineering, JNTU Kakinada,*
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ABSTRACT

Digital investigation is one of the trending research areas now days in present digital world. Investigating a crime scene is very crucial and challenging for both the police and investigating departments. As a novel solution for this approach this research embellishes various studies and observations during the investigation as well as to lay a path to digitize the investigations process. This research motivated us biologically to present the simulation of various events present at the crime scene. The approach started with the bodily fluids, blood pooling, surface of the body lay down, oxidization after death ,skin tones observed and finally Sarcophagus flies As a part of our research we demonstrate different approaches on various models to compare the real world photographic examples.

Keywords: Entomology, blow flies, image acquisition, time of death

I. INTRODUCTION

Entomologists do a vague research in finding the evidence at the crime scene. As a part of their investigation work, they impose their utmost knowledge in the preserve of evidence through the image of insects available in the surroundings of the dead body. To explain in court of justice they testify and produce insect related evidence in various stages of the insect life cycle. Succession of species may also help for investigation. Some insects prey on the fresh corpse as other relies on decomposed and decayed corpse. The investigators will also note the other insects that relay and feed up on the dead body.The vast study of the research determined post-mortem interval (PMI) is a dynamic approach and main objectives of doing medico autopsy as well as legal autopsy. The PMI can be determined from different observations through mortis of different types such as Algor Rigor, Livor eye changes, and coeliac contents etc in the hourly stages of the necropsy period. In addition to symptoms of putrefaction, the vermin's play the most considerable role as a evidence in reckoning PMI is done in the late post-mortem phase.

Sarcophagus flies, typical flies which feed on larger vertebrate carcasses lay their eggs on soggy sectors, such as in particularly around the eye balls, snout, gullet and anus and genitalia if exhibited. The larva stage of a fly is well known to be as maggot. These are nothing but the eggs with ovum with protectable shell lay by the flies. These eggs hatch within 24 hours and hundreds of flies can be appearing in place of the dead body. These grow day by day and shed their outer layer skin a number of times throughout its life time, the larvae, which each ecdysis being called an in star, finally pupate grew into a fresh winged insect come into act on the dead body. Species and the ambient temperature are very important and noted as a particular observation in this instance of time from egg lying through star to pupae.

The research was carried by remembering various instances occurred in child hood as well as seen in various post-mortem cases at hospitals, reading books and research articles based up on the 40 decomposed bodies which undergone for post-mortem perusal in the Department of Forensic Medicine and Toxicology at Government Medical College, Amritsar. Bodies were clusters depending upon the categorization of tetrad stages

AN IMPROVED K-MEANS ADAPTIVE CLUSTERING METHOD ON LARGE DATASETS

JN Rao, AR Reddy, NV Naik - Turkish Journal of Physiotherapy and Rehabilitation

PERSONALIZED MEDICINE PREDICTION USING DEEP LEARNING APPROACH

JN Rao, B ChintalapudiSowndaryaLahari, S Krishna - Turkish Journal of Physiotherapy and ...

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PREDICTING CUSTOMER GROWTH IN MARKETING AUTOMATION WITH ENSEMBLE LEARNING

Srilatha Yelamati, Sudhakar Atchala • Published 2021 • Business, Computer Science

The number of customers who change service providers is referred to as customer churn. Customer relationship management (CRM) is a business strategy that integrates cutting-edge technology and customer needs to create an exceptional customer experience. Improve business relationships and help the company keep customers at arm's length are both of equal importance. A big goal is to build a reliable churn prediction model so we can prevent churn, control churn, acquire new customers, and retain... Expand

Figures from this paper

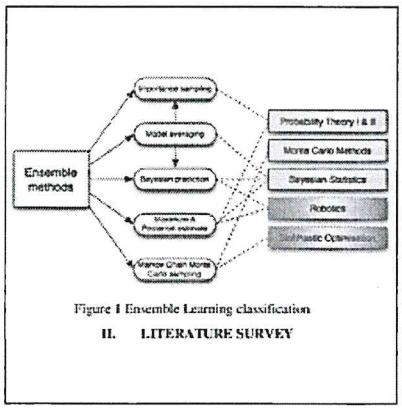


Figure I Ensemble Learning classification

II. LITERATURE SURVEY

Figure 1

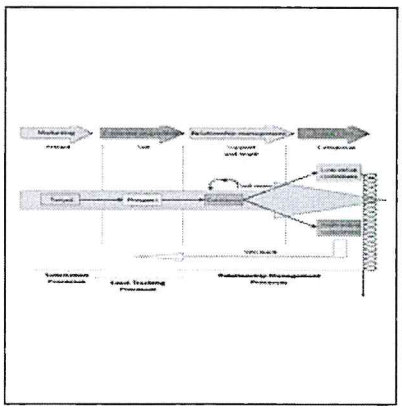


Figure 2

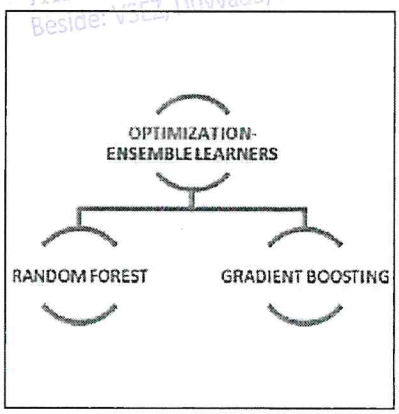


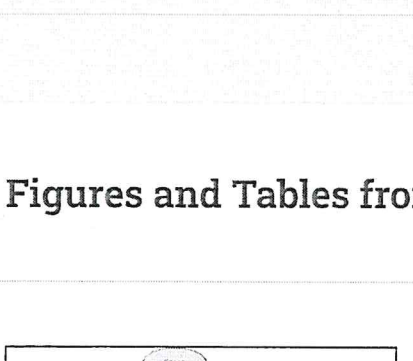
Figure 4

View All 8 Figures & Tables

AN ENHANCED USAGE PATTERN HYBRID METHOD FOR MINING HUI SETS FROM LARGE DATASETS

Avantika Tiwari, Sundeep Saradhi Kanthety, +1 author J. Rao • Published 2021 • Computer Science

Extract high-usage item sets from relation-based and transaction-based databases, and these databases are classified as located item sets that are indeed related to high-usage data items. By identifying innovative luminous information. We are able to develop analytical methods for forecasting and systematically exploring data from various industry applications. Several methods have been proposed in recent years. They find it difficult to explore large amounts of data based on transaction... Expand



Figures and Tables from this paper

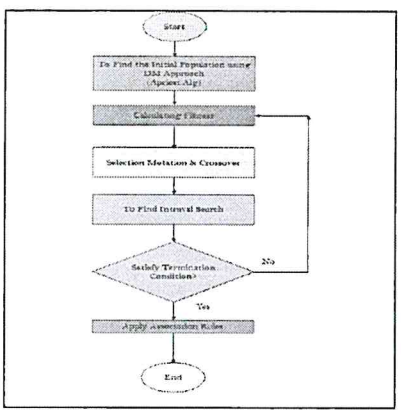


Figure 1

Input: A information flow DS, a pre-defined application desk, a user-defined lowest limit MinUand a user-specified screen dimension tsw
Output: A record of MaxHUIs
1)Initialization: Maxsw-Tree= and TotalU=0
2) while a new deal Tidkarrives into DS
3)TotalU=TotalU+u(Tidk)
4)Projk=Transaction-projection(Tidk)
5)for each projector screen
6)MUISW-Tree_updating(p,MUISW_Tree)
7) end for
8)end while
9)set time-links to weblink all base customized nodes in different branches
10)if(user_request=true)
11) set a suggestion pt which factors to the leftist node of MUIsw-Tree
12) temp_list=bottom-up_tracing(MUISW-Tree,MinU,pt)
13)output MaxHUIs in temp_list
14)end if

Table 1

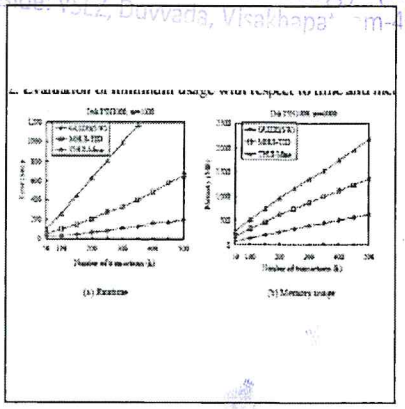


Figure 2

Turkish Online Journal of Qualitative Inquiry (TOJQI)

Volume 12, Issue 5, June 2021: 1361 - 1368

Research Article

Avoidance Of Electoral Infringement Using Biometric Authentication

Ch. Srinivasa Reddy[1], Bandaru Venkatesh[2], M. Somasundara Rao[3], G.Indira Devi[4], G. Krishna Karthick[5]

ABSTRACT

It has consistently been an exhausting errand for the political race commission to collect information in our country, the most important vote based system on the earth . Crores of rupees are spent on this to make sure that the races are without revolt. Yet, presently a - days it's gotten unpredictable surely powers to enjoy fixing which can within the end of the day cause an outcome as against the real decision given by individuals. Our task expects to introduce another democratic framework utilizing biometrics to remain far away from encroachments and to enhance the exactness and speed of the interaction. The framework utilizes thumb impression for citizen recognizable proof as we realize that the thumb impression of every individual features a special example. Accordingly it might have a foothold over the present day casting a ballot frameworks. As a pre-survey system, an information base comprising of the thumb impressions of the relative multitude of qualified electors during a body electorate is formed. During decisions, the thumb impression of an elector is entered as contribution to the framework. this is often then contrasted and therefore the accessible records within the information base. within the event that the precise example matches with anybody within the accessible record, admittance to form a choice is conceded.

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Evaluation of Mechanical and Wear Roperties of AA2024 Through Co_2 Casting Using Silica Sand

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Abstract: Silica sand is generally used moulding sand in the casting industries and majority of the castings produced worldwide because of its easy availability and binding properties. In the present study, silica sand is taken as moulding material and studies the effect of different shapes on the mechanical and wear properties, micro hardnessand wear tests. For this casting the selected material (AA2024) into two different shapes (cube and cylinder) using silica sand as the moulding material and study the effect of split piece pattern on the properties and wear of the casted components. Co_2 casting is chosen as the industrial process and study mainly focused on to produce the defect free surfaces on AA2024 with split piece pattern which is difficult to control. Destructive tests like hardness, surface roughness are conducted and wear properties of the components is also observed. It is observed from the results that cylinder component has higher hardness due to the faster cooling rate, lower surface roughness and lower wear rate. Analysis concluded that Co_2 process is better working for the cylinder type of objects.

Keywords: Silica, AA2024, Co_2 process, cylinder.

1. Introduction

Aluminum alloys are used widely for various applications due to their lightweight and specific strength. In particular, transportation and automotive industries most often offer the Aluminum due to the greenhouse effect. Therefore, modifying the properties is an alternative way to promote the alloys for using them effectively. Adding various elements to the substrate resulted in improving mechanical properties, thereby microstructure characteristics. The casting process is one of the most suitable ways to make substrates changes with low cost and high quality. Most of the new alloys were investigated to determine their behavior during the casting and following treatment. A study was previously performed on Al and 4.5 Cu alloys using Co_2 casting method [1]. The casted parts were compared to the mechanical and wear properties [2].

Transient Structural Analysis of Electric Bus Chassis Frame

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Abstract: From the few past years, usage of electric vehicles is increasing over the usage of the petrol or diesel vehicles. The main reason behind that is increasing cost of fuel and air pollution. In this vehicle chassis frame also play a major role for giving the support to the other parts acting as skeleton of the structure. During heavy load and dynamic loading conditions the structure of the chassis frame may fail and causes breakdown. It is very important to analyze the chassis frame under different loading conditions i.e., static and dynamic loading conditions. From this research paper work, the structure of the chassis frame with box section, channel section, channel section (with increased thickness) and channel section using stiffener are analyzed under static loading and transient loading (Time varying loads) in FEA Software (ANSYS 2020R2 Student Version). The material of the chassis frame is selected as Steel, Aluminum of type 6061-T6 , Aluminum of type 7075-T6 and Titanium alloy. Loads and boundary conditions are applied as per the research article [1] and proper mesh is given to the geometry. From the static and transient analysis it is concluded that channel section using stiffener is having less stresses and less deformations compared to the box section, channel section and channel section with increased thickness using with different materials. Chassis frame with steel having less stresses and low deformation compared to the remaining materials. By this result, it has concluded that the channel section with stiffener using steel material gives better performance compared to the other sections.

Keywords: FEM, Static Structural Analysis, Transient Structural Analysis.
Nomenclature: σyt = Yield Strength, ρ = Density, E = Young's Modulus &μ = Poisson's ratio.

1. Introduction:

"Chassis" a French term which means the complete automobiles without body and it includes all the systems like power plant, transmission, steering, suspension, wheels tyres, auto electric system etc. without body. There are 3 types of chassis frame sections which are shown in the Figure 1.

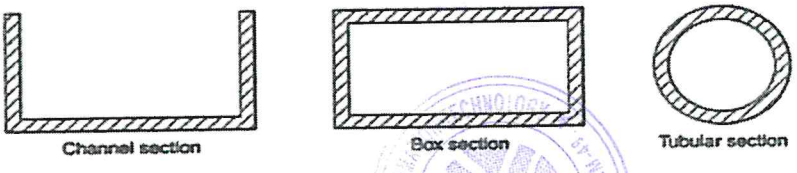

Figure 1. Different type of chassis frame sections

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TOWARDS SECURITY AND PRIVACY CONCERNS IN THE INTERNET OF THINGS IN THE AGRICULTURE SECTOR

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ABSTRACT

The Internet of Things (IoT) is an important player in the agricultural industry. IoT is developing smart irrigation systems, crop monitoring, crop tagging, crop security, crop disease diagnosis, and crop selection. The potential applications of IoT in agriculture are limitless. The Internet of Things (IoT) allows the global smart city paradigm. Intelligent communities include smart homes, smart farms, smart environments, smart fitness, smart government, and so on. The Internet of Things is also utilized in the oil refining, gas mining, and manufacturing industries. IoT is increasing efficiency, optimizing costs, maximizing energy, sustaining forecasts, and giving people with a great lot of ease. With more diverse systems and data processing, security concerns are increasing. Security and privacy concerns are the primary impediments to the growth of IoT. This article investigates different security and privacy problems in the Internet of Things.

Keywords: Internet of Things, Security, Smart Agriculture, Privacy, Attacks, Threats.

I. INTRODUCTION

The term "Internet of Things" was one of the most remarkable pheasants of the previous decade, taking use of Kevin Ashton's supply chain management for the first time at a presentation in 1999. Because of advancements in computers, the Internet, and the creation of data from intelligent gadgets, Ashton contends that we must carefully reconsider the "material" character of how we interact and exist in the real world. He was later Executive Director of MIT's Auto-ID Centre, where he helped extend RFID deployments in broader realms, which created the foundation for the present IoT concept [1].

By expanding numerous web-related products and gadgets, they are used in the real world to discuss and render people, The term "Internet of things (IoT)," in Forbes magazine, was quoted by Kevin Ashton, Radio Frequency Identification (RFID) individual [2]. IoT is a structure framed by physical things and widely referred to in formal ways as elements that speak to one another. The author mentioned the prospect of making papers more identifiable, easily available, localizable, and helpful for communication techniques such as the internet, LAN, WAN, RFID, or sensors.

The primary goal of IoT is to collect data from users who are authorized to use wireless network functions. According to a survey around 50 billion intelligent devices will be a part of IoT by 2023. Today, several organizations and working groups rely on IoT, including Samsung, Apple, Thread Alliance, and others.

Investigation on SAR of a Triple band LinearlyPolarized Wideband PIFA for Mobile Applications

Y. Sukanya, P. Jayasree • Published 2021 • Business

This paper is based on analysis of novel triple band linearly polarized multiband PIFA (Planar Inverted –F Antenna) for mobile applications suitable for GSM 1800, LTE 2400 and 5.2 GHz for WLAN, WiMax and Wi-fi (2.4GHz) and Wi-Fi (5.1 GHz) Indoor applications, Bluetooth and 5G Communications. The proposed design has a compact dimension of 60mmx30mmx1.6mm that is suitable for slim mobile phones because the PIFA structure is directly printed on to the non-conducted material. The proposed design... Expand

Figures and Tables from this paper

PARAMETER	VALUE (mm)	PARAMETER	VALUE (mm)
L	60	wf1	1.4
W	30	wf1l	11
hg=hp	0.035	wf1w	13.8
Hs	1.53	wf2	3
Gx	1	wf2l	15
ex2	3	wf2w	13
Gg	5.7	wf3	1.4
Wg	1.4	wf3l	26
Gl	0.5	Cbl	1.4
Gw	0.4	Cbw	0.6
Gd	0.2	Cbd	0.6
g2	14.3	Gf	0.5

Table 1: Specifications of proposed design

Table 1

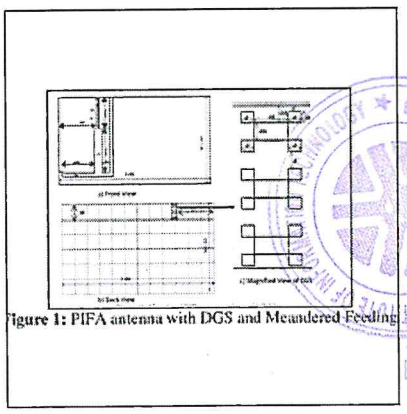

Figure 1: PIFA antenna with DGS and Meandered Feeding

Figure 1

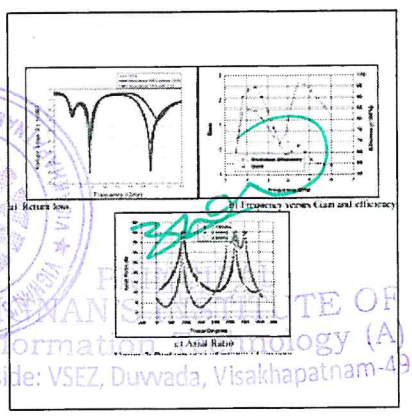

Figure 2

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Volume 12, Issue 7 July 2021: 13241 – 13251

Linearly Polarized Wideband Meandered Pifa Antenna For Mobile Applications

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University

Abstract

Generally, 6 to 7 patch antennas are used in a mobile for different applications. In this paper, a single antenna is proposed to address several applications in a mobile phone. For this purpose, a Meander line feed planar inverted F- antenna (PIFA) with DGS that radiates at multiple frequencies is deliberated in this work with VSWR < 2 at all the desired frequencies as it provides good isolation among the desired frequencies. Flame Retardant 4(FR - 4) is preferred as substrate(loss tangent,δ(0.02)) with thickness of 1.53mm.The ground defected structure resembles as slotted sections with fractal shape. The proposed antenna is radiated at three frequencies such as 1.7GHz (1.64 - 1.82 GHz), 2.4GHz (2.2 - 2.6 GHZ) and 4.8GHz (4.44 – 5.35 GHZ) with a reflection coefficient of -12.9dB, -39dB, - 39dB respectively. With the proposed structure the bandwidth is enhanced by 19% at the upper band with a peak gain of 5.32dBi along with the achievement of linear polarization at all the desired frequencies. The proposed design has a compact dimension of 60X30X1.6mm (0.70x0.35x0.018 wavelengths at lower band) and is well suited for 4G,WLAN, WI-FI and Wi-Max applications..

Keywords: Meander line, PIFA, DGS, Fractal, Wide band

1. Introduction

All wireless services must now be bundled into a single device with a variety of features, such as Bluetooth, Wifi, and LTE technologies for high-speed and high-quality data transmission. Antennas that handle several bands must be manufactured with a variety of specifications in order to provide the required functionality. As a result, the goal is to design an antenna that can operate in several bands to accommodate a wide range of applications [1,2]. An antenna must have a wideband, good radiation performance and enhanced gain as a front component. Patch antennas have a narrow bandwidth, poor gain, and low power handling capacity. Improvements to the antenna's performance have been attempted. Finally, the Planar Inverted F antenna (PIFA) was proposed, along with several approaches for multiband operations in mobile applications with improved performance [3,4]. Compactness, low side lobes, low profile, and ease of integration are among advantages of a PIFA antenna along with good Specific Absorption Rates (SAR) [22,25]. PIFA is still one of the most used antennas in today's mobile phones. Several methods were proposed and one of the methods to design PIFA is to print antenna directly on a substrate [5-7] without using any gap between the ground and antenna.

Furthermore, in order to attain the desired configuration, several design characteristics must be properly tweaked or optimized. Various strategies, such as changing the shape of the patch, have been proposed to obtain multi-band operations [8,11,23,24,25], meandering technique [9] and slotted structure in the ground [14]. Ground slots with open-circuited arms generate new resonances, whereas those with short-circuited arms serve as tuning stubs [14]. One of the strategies for improving the bandwidth and gain of a patch antenna, as well as

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Metabolomics the New Diagnosis of Breast Cancer

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ABSTRACT

Chest Carcinoma is one of the leading causes of death in women. Early prediction of chest carcinoma can bring up the chances of viability. Chest carcinoma can be diagnosed by a numerous variety of tests which include a mammogram, ultrasound, MRI and biopsy. 90% of them are image based. Cancer can also be predicted much before a lump is formed by studying the metabolism of the breast cancer cell. The major divergence between a normal breast cell and a breast cancerous cell is that the apoptotic cycle and the transcriptional cycle are malfunctioning. This malfunction is caused by over or under production of certain metabolites. In our work we identified 8 such metabolites and their correlated metabolic cycles. Reactome and KEGG databases are used to study these pathways in detail. Computational models are developed for these 8 pathways in Cell Designer and the metabolomics of these pathways are collected from different curated data bases such as BioModels.net and they are simulated or executed using Control Panel and Copasi GUI. The metabolomics of these computationally modelled pathways are developed into a dataset.

Keywords

Metabolomics; Chest Carcinoma; Breast Cancer Cell; Kegg; Cell Designer

Introduction

Omics is a branch of knowledge of life sciences. Omics integrates genomics, proteomics, transcriptomics and metabolomics. Metabolomics integrates the methods to locate and calculate cell metabolites with the help of complicated and logical techniques by using numerical and numerous varieties of procedures for data unsheathing and information elucidation. The metabolomics provides the complete information regarding the physical state of a human being. Mass spectrometry along with liquid, gas or NMR chromatography can be used to audit numerous metabolites concurrently. [1]

1.1. Reactome:

REACTOME is a free open source curated and peer reviewed human pathway knowledge base. It contains normal and disease-related pathways. Every molecule and every event in REACTOME are mapped with the correct cellular compartments. . This database is called REACTOME because reactions are the steps involved in the pathways, they can either be binding, dissociation, degradation, phosphorylation, dephosphorylation, transport etc.

1.2. KEGG

KEGG stands for Kyoto Encyclopedia of genes and genomes. KEGG is a combined database of 18 handpicked databases. These 18 databases are categorized into 4 groups. KEGG Pathway database is a group of physically worn track plots showcasing understanding of the elementary reciprocity, retort and association webwork for Metabolism, Genetic Information, Human Diseases, and Drug Development etc. Human diseases database consists pathways related to Cancer overview, Cancer specific types, Immune diseases, etc. Cancer of specific types contains pathways related to Thyroid cancer, Basal cell carcinoma, Breast cancer etc. In Breast cancer there are pathways related to Luminal A breast cancer, Luminal B breast cancer, HER2 positive breast cancer, Basal like/Triple negative breast cancer.

Corpus ID: 235430410

Doji based intraday strategy for indian stock analysis [an experimental study on nse-india during covid19]

S. Madem, D. Suryachandra Rao, +1 author N. Ramya · Published 2021 · Economics · Turkish Journal of Physiotherapy and Rehabilitation

In the past few days, Indian Stock markets are continuously falling due to the COVID-19 outbreak pandemic, and other global economic factors connected it. During this time, not only the Small but also the big player's wealth was affected. But Stock markets are wealth creators for long term investors, can be a small player like a trader or a big player like HNIs. Margin money is supplied by almost all the Stockbrokers including discount brokers in India to enable the intraday traders with a high... Expand

References

SHOWING 1-10 OF 10 REFERENCES

Intraday Market-Wide Ups/Downs and Returns

Wei Zhang, Shen Lin, Yongjie Zhang · Economics, Business · 2016

Using stock market data over 16 years for Chinese stock markets and over 3 years for U.S. stock markets, this study explores the explanatory power of early intraday market-wide up and down movements... Expand

Profitability of Candlestick Charting Patterns in the Stock Exchange of Thailand

Chromatographic Method for Quantification of Clofarabine Substances in a Pharmaceutical Formulation

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[3] Vignan's Institute of Information Technology (A), Duvvada, Visakhapatnam-530049.

ABSTRACT

A novel, simple and economic high performance liquid chromatography (HPLC) method has been developed for the estimation of Clofarabine in bulk and tablet dosage form with greater precision and accuracy. The method was validated as per ICH guidelines. Validation studies demonstrated that the proposed HPLC method is simple, specific, rapid, reliable and reproducible. Hence the proposed method can be applied for the routine quality control analysis of Clofarabine in bulk and tablet dosage forms. All the components of the system are controlled using SCL-10Avp System Controller. Data acquisition was done using LC Solutions software.

Key words: Clofarabine, HPLC, Method Development, Validation, ICH guidelines

INTRODUCTION

Clofarabine is a second-generation purine nucleoside analogue designed to overcome the limitations and to incorporate the best qualities of both cladribine and fludarabine. Clofarabine enters cells by passive transport across lipid membranes as well as by active nucleoside transport. Once inside the cell, clofarabine is phosphorylated to its active triphosphate form by cellular kinases, including deoxycytidine kinase. Whereas fludarabine and cladribine inhibit only DNA polymerase and ribonucleotide reductase, respectively, clofarabine inhibits both of these enzymes [1-2]. This results in depletion of the amount of deoxynucleotide triphosphate available for DNA replication, as well as inhibition of DNA strand elongation and RNA transcription [3]. Given its mechanisms of action, clofarabine was predicted to work synergistically with other chemotherapeutic agents such as other purine nucleoside analogues and DNA-damaging or cross-linking agents such as anthracyclines and platinum agents. It initially showed efficacy in treating pediatric acute lymphoblastic leukemias and gained approval from the US Food and Drug Administration in 2004 [4].

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Second order Derivative Spectrophotometric determination of Fe(II) using 3,4-DihydroxyBenzaldehydeTiosemicarbazone(DHBTSC) in presence of micelle medium

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[4]Deapartment of Chemistry, Govt. Degree College, Chodavaram, Visakhapatnam, India

ABSTRACT

A rapid and sensitive method has been developed for the determination of Fe(II) based on complexation reaction between the metal ion and 3,4,-dihydroxybenzaldehydethiosemicarbazone (DHBTSC) in the presence of non-ionic surfactant Tween-80. The important parameters affecting the analytical procedure were optimized. Absorption maximum for a ternary complex was noted at λ_{max} 365 nm. The reaction was found to be rapid at room temperature and absorbance remained constant for more than 24h. The method obeys Beer's law in the range13.96 to 97.73 ng /ml. The apparent molar absorptivity of 4.21×10^5 L mol^{-1} cm^{-1} and Sandell's sensitivity 0.013ng/ml. The effect of foreign ions was tested by taking a constant concentration of metal ion and determining its concentration in the presence of $\geq$ 100 folds in excess of foreign ions. The method was successfully used in the determination of Iron(II) in Leaf sample. Second order derivative spectrophotometric method were developed at λ_{max} 485nm for the determination of Iron, which was more sensitive than the zero order method.

Keywords: Spectrophotometric Determination, Iron, 3,4-DHBTSC, Surfactant Tween-80, Leaf sample.

Introduction

Iron is one of the most important transition element in living systems, being vital to both plants and animals. The stunted growth of the former is well known in soils, which arc either themselves deficient in iron or in which high alkalinity renders the iron too insoluble to be accessible to the plants. Iron was the first minor element to be recognized as being essential to human being and was used in the treatment of anaemia. The adult human body contains about 4g of iron (i.e., -0.005% of body weight) of which about 3g are in the form of haemoglobin. Proteins involving iron are also present in the human body and its major function is oxygen *transport* and storage. In water samples, iron may occur in true solution either in ferrous or ferric form. Therefore, the determination of iron in environmental samples is important. There are two main forms of iron salts with numerous formulations such as: amino acid chelates, carbonyl iron, polysaccharide iron, combination products and extended release products available globally[1]

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STUDY OF MECHANICAL EFFICIENCY, INDICATED THERMAL EFFICIENCY, BRAKE THERMAL EFFICIENCY AND FUEL CONSUMPTION WITH AND WITHOUT EGR

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Abstract— **Early (1970s) EGR systems were unsophisticated, utilizing manifold vacuum as the only input to an on/off EGR valve; reduced performance and/or drivability were common side effects. Slightly later (mid 1970s to carbureted 1980s) systems included a coolant temperature sensor which didn't enable the EGR system until the engine had achieved normal operating temperature (presumably off the choke and therefore less likely to block the EGR passages with carbon buildups, and a lot less likely to stall due to a cold engine). Many added systems like "EGR timers" to disable EGR for a few seconds after full-throttle acceleration. Vacuum reservoirs and "vacuum amplifiers" were sometimes used, adding to the maze of vacuum hoses under the hood. All vacuum-operated systems, especially the EGR due to vacuum lines necessarily in close proximity to the hot exhaust manifold, were highly prone to vacuum leaks caused by cracked hoses; a condition that plagued early 1970s EGR-equipped cars with bizarre reliability problems (stalling when warm, stalling when cold, stalling or misfiring under partial throttle, etc.). Hoses in these vehicles should be checked by passing an unlit blowtorch over them: when the engine speeds up, the vacuum leak has been found. Modern systems utilizing electronic engine control computers, multiple control inputs, and servo-driven EGR valves typically *improve* performance/efficiency with no impact on drivability.**

Keywords—Egr, Constant Speed Load Test, Mechanical Efficiency, Indicated Thermal Efficiency, Brake Thermal Efficiency

I. Introduction

PERFORMANCE AND TESTING OF IC ENGINES:

The engine performance depends on power requirement of the apparatus or vehicle to which the engine has to be connected.

To evaluate the performance, tests are generally conducted to find of the power developed, fuel consumed, air consumed, heat losses, speed etc.

ENGINE PERFORMANCE PARAMETERS: In these Two categories namely,

Dependant Parameters:

Thermal efficiency, Brake power, torque, indicated power, Mechanical efficiency, Brake specific fuel consumption etc.

Independent Parameters:

Load, Speed, air-fuel ratio, Crank angle, Compression Ratio, Valve Timing, Turbulence in Combustion Chamber, Mass of Inducted charge, heat losses, Dissociation, Altitude Etc.

Brake Power:

The Brake Power is the useful power available at the Crank shaft or clutch shaft. The Brake Power is less than the Indicated Power.

Mechanical energy losses due to friction, pumping power required driving auxiliaries and un-accounted the sum of all these losses, converted to power is called Friction Power (FP)

The remaining energy which is delivered to the drive shaft is useful energy for doing mechanical work which is termed as Brake Power (B.P).

For calculating Brake Power, Torque is measured by coupling a device is called Dynamometer to the engine Output shaft.

The Brake Power is expressed as $B.P=\frac{2\pi NT}{4500}$ HP;

Where

View article

Satya guru TVSPV

Chemical speciation of ternary complexes of Pb(II),Cd(II) and Hg(II) with L-glutathione and L-methionine in Acetonitrile-water mixture

Authors N.V.V. Simhadri2 Satya guru TVSPV1*, K. Bhaskara Rao2,

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Research Article | Open Access
ISSN (Online)- 2378-9026
DOI :

AMERICAN RESEARCH JOURNALS
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A Conspectus of Gender Bias: Instances from the Major Works of Mulk Raj Anand

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Professor of English and International Examiner, Guest Faculty- BITS Pilani (WILP)

ABSTRACT

This paper highlights the problems faced by women in 20th century by citing the examples from the novels of Mulk Raj Anand. The gender bigotry in the patriarchal society of colonial India, in particular, is deftly portrayed by Anand through his characters. The atrocities of the male characters like Reggie and the suffering of female characters like Sohini,Gauri,Rukmini allow the readers to get a realistic perception of the days of colonial era, particularly in the lower strata of society working in the tea plantation that were governed ruthlessly by the colonial representatives. The novels of Anand are a record of the social conditioning of the working class women and men of those days.

KEYWORDS: *Gender- female characters in Mulk Raj Anand Novels-criticism in society-treatment of women.*

Gender' is a psychological and cultural term. It denotes socially constructed roles, behaviors, activities, and attributes that a particular society considers apt for men and women. It is decided by cultural, social, political and economic forces which influence social behavior of men and women."[1] The gender difference is the foundation of a structural inequality between a man and woman. The discrimination based on the gender of a person is perpetuated through the socio-cultural and psychological mechanisms prevalent in society. This paper highlights the problems faced by women in 20th Century and the present trend by citing the examples from the novels of Mulk Raj Anand.

As the Sanskrit sloka "Yatra Naryantu Pujyante tatra ramante devatah" says, where there is respect for women, there will be prosperity. Mulk Raj Anand is one of the prominent writers in the saga of Indian Writing in English who highlighted this concept in his works meticulously. In many novels of Anand, the current scenario is projected in a more picturesque style. In reality, a person is considered good or bad based on the circumstances, the place of his or her growth and financial status.

In his novels, Anand shows various characters of women who are suppressed and humiliated in the patriarchal society. He portrays the socio-religious hypocrisy rampant in various walks of society. In Anand's *Two Leaves and a Bud*, the coolie women faced various problems in the hands of the English. The plantation masters or sahibs molest the coolie women, irrespective of their age. "The Coolie women bent to their plucking with fear in their hearts and a queer confusion in their heads" (p 50)[2]. Reggie felt that "The women workers are more efficient, Reggie assured himself, quite insensitive to the under currents of emotion he had let loose in their souls. He favored them almost involuntarily, hoping to establish a relationship of informal intimacy to facilitate....." [3] (p50). Anand depicted various scenes where the sexual assault and material wants were evidently shown.

As mentioned earlier, Reggie was attracted by the beauty of women and in the same way, he maintained illicit relation with Neogi's wife also. For Coolie women, there was no one to take care of their babies at their residence. So, they carried their children along with them in the basket. If anyone was unexpectedly caught by the master, she had to face the consequences. Besides severe admonition, a fine of three annas was imposed on her. While scolding the coolie women, Reggie used abusive language like deceitful bitches, dirty cheats, and crafty bitch, and so on.Gangu's daughter

In this novel, Gangu was killed while trying to protect his daughter from being raped by Reggie Hunt, a British colonial official. He was the Assistant planter He was arrogant and sadist who tried to molest Gangu's daughter. Each and every nook and corner of the tea plants leaves and buds are the silent witnesses of Reggie's atrocities. *In Two Leaves and a Bud*, Narian, a coolie, describes him rightly when he says **"He is a very Badmash sahib and he has no consideration for any one's mother or sister. He is openly living with three coolie women!" (42).**[4]

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Research Article

Girish Karnad's Wedding Album A Mockery on Indian Arranged Marriages

Dr.Mohd Shamim, Dr.K.G.B.Santhosh Kumari, Vimochana M, Prema S, Anuradha S, T.Narayana

Abstract

Marriage is a primary social institution of Indian society; it has been the license to the conjugal relationship in Indian society for ages. The transformations gone through by this institution have given way to various deviations from the usual arranged marriage such as love marriages, register marriages, inter-caste marriages etc. However, the predominance given to arranged marriages hasn't reduced much. The play *Wedding Album* by Girish Karnad vignettes on the typical Indian arranged marriages. On the crust,, the play may look like celebrating the formalities of Indian marriages whereas at the core it is a mere mockery on typical arranged marriages.

Key words: *Conflict, Arranged marriage, Mockery, the mindset of youngsters*

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Introduction

Girish Karnad's *The Wedding Album* is a play exceptional from his usual style. Karnad is well known to deal with historical and mythological subjects in almost all of his plays. The keywords for most of the research done on him would be words like myth, folklore, culture, traditions, etc. However, the play *The Wedding Album* is unlike his usual plays of Karnad. Through this play, Karnad (2018,p.xix) registers his entry into the modern realistic domestic drama. This is evident in the following lines:

Corpus ID: 236470130

A CLOUD-BASED SMART-PARKING SYSTEM BASED ON INTERNET-OF- THINGS TECHNOLOGIES

K. Komali, Dr. J. Vijaya, +2 authors Erusu Rammurthy Reddy • Published 2021 • Computer Science

This paper develops a network architecture based on the Internet-of-Things technology.introduces a novel algorithm that increases the efficiency of the current cloud-based smart-parking system. This paper proposed a system for finding free parking slots automatically with least cost based on new performance metrics to calculate the user parking cost by identifying the distance and the total number of free slots in each car park. This cost will be used to offer a solution of finding an available... Expand

References

SHOWING 1-10 OF 10 REFERENCES

Smart Routing: A Novel Application of Collaborative Path-Finding to Smart Parking Systems

Callum Rhodes, W. Blewitt, Craig Sharp, G. Ushaw, G. Morgan •

Business • 2014 IEEE 16th Conference on Business Informatics • 2014

TLDR This work simulates a smart parking system for an urban environment, and shows that a novel approach to collaboratively planning paths for multiple agents can lead to reduced traffic congestion on routes toward busy parking areas, while reducing the amount of time when parking spaces are vacant, thereby increasing the revenue earned. Expand

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http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.05.797

Emotional Management to Speak in English Fluently and Effectively

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ABSTRACT- The present research examination elucidates the ways emotions influence the speaking abilities to emerge aspirants from rural Northern Andhra Region. Research results imply that positive and negative emotions contribute to improve and diminish English language speaking abilities. The quasi-experimental method is the effective to provide strong evidence suggesting cause and effect relationship. The outcome of the study shows that 'the negative emotions drag the speaker so that it should manage well to enhance speaking abilities in L2': Language uneasiness envelops the sentiments of negative and hassle emotions associated with the acquisition of a language if it is not a speaker's L1. There is still a lot to find out concerning the function of emotions to speak in a foreign language and will wrap up with confident commendation for potential research. In this correlation, the creative language activities through the drama technique would be the solution to manage emotions and give ample scope to present one's opinion, experiences and subject competences to the audience with confidence and effectiveness. Results are supporting an efficient training to manage emotions to speak fluently and motivational language activities through drama technique as a positive language learning course of action.

Keywords: Activities; Drama; Language activities: Emotions; Motivation

I. INTRODUCTION

Leaders of organizations at all levels need to be good at speaking in English. What is the state of mind when one standing in front of an audience? Visualize the situation and see all those people looking at one and expecting an exceptional performance. Speaking is an intellectual and physical skill; this is the skill that becomes increasingly important as one wants to grow in one's career. The emotions have a great effect on the speaker while delivering the speech to the audience. The word 'affect' refers to several meanings, such as the feeling of self-assurance, enthusiasm to communicate, or anxiety. Perchance the significant reaction is language anxiety. That said it is essential to properly manage our emotional articulations. Most likely, unseemly emotional expressions can unleash destruction and cause huge harm to human relationships and professional development. So many studies proved that continuous learning and practice will help to manage emotions, especially practicing language activities through drama techniques in the learning process.

Relating students' sensation and cognition of language through drama activities as it facilitates to manage threat in language learning and practice an association amid contemplation and action. The drama will get justify between receptive and dynamic skills of teaching English as a second or foreign language. Language activities through drama a course group will tackle, practice by assimilating listening, speaking, reading and writing skills; especially, targeting speaking skills enhancement. The drama also cultivates and upholds students' stimulus by creating an ambiance that would be pack with wit and entertainment.

II. LITERATURE REVIEW

Linguists tried to examine the emotional impacts on the second or foreign language acquisition method. Scovel's (1978) described as 'the research into the relationship of anxiety to foreign language learning has provided mixed and confusing results; immediately suggested that 'the anxiety itself is neither a simple nor well-understood psychological construct nor that it is perhaps premature to attempt to relate it to the global and comprehensive task of language acquisition' (Scovel, 1978).

One will have reciprocal relationships and success while communicating with others if one has emotional consciousness and tries to understand others' feelings well. Conscious of the purpose and manner of

Adsorption of Heavy Metals using Low-cost Adsorbents – A Comprehensive Review

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Abstract:

Industrialization has witnessed a dramatic deterioration of the quality of the natural resources and water is no exception to it. The water resources are being continuously polluted by the effluents emanating from the industrial, agricultural and household processes. Among the pollutants, heavy metals pose greater threat to human health and ecosystems since they are finding their way into the environment and more so into the aquatic environment. Though many techniques are being employed to remove these metals from the effluent waters arising from anthropogenic operations, they suffer either from cost factor or environmental compliance. However, a novel technique, adsorption is gaining prominence in the wastewater treatment. Of late, Adsorption using low cost adsorbents, mainly bio based is gaining importance since they are of low cost, easily available and environmentally acceptable. The present paper reports, a comprehensive review on the phenomenon of adsorption of heavy metals such as Chromium, Arsenic and Nickel using low cost adsorbents.

Keywords: Adsorption, Heavy metals, Industrialization, Low cost-adsorbents, Water Treatment

1. Introduction:

Normally, water, which is the life sustaining compound, is also the most sought-after resource on planet earth. Human race is hugely dependent on water for various activities, and it is estimated that less than 1.0% of the earth's water is available for immediate use and is being shared among the world population (World Atlas, 2018). India harbors 4 % of the world's freshwater resources but is home to 16% of the global population. By the year 2050, the total demand for water is expected to be 1,180 BCM (billion cubic meters), the demand share is dominated by Agriculture (70%), Households (9%) and Industries (7%) (National Commission on Integrated Water Resources Development (NCIWRD)). It is estimated that in India, about 58 % of the population are without access to safe drinking water (ide-india.org). Despite the low amount of water resources present and with the ever-increasing population, the state of the water resources is deteriorating at an alarming rate mainly due to the industrialization, population explosion coupled with pollution and lack of proper treatment facilities. Water is polluted when the contaminants in it are present in concentrations beyond permissible limits making the waters unsuitable for human use. The sources of water pollution are wide and varied and it results from organic compounds, inorganic elements and surface runoffs. The multitude of anthropogenic activities is the main cause for the deterioration of water quality. In the post industrialized era especially in recent times, the steady increase of heavy metals in surface waters has become a major concern and improper treatment of industrial effluents is cited as one of the dominant reasons. India's per capita water availability had declined sharply since 1951 and the pace of decline is expected to increase rapidly due to population rise linked with the lifestyle changes and climate change consequences. India's sustainable future lies in the efficient management and conservation of water systems, more particularly with treatment and recycling of wastewaters.

EFFECT OF SHEAR INFILL WALLS ON THE MULTI TOWER STRUCTURES SUBJECTED TO SESMIC FORCES

A Satyaveni - Design Engineering, 2021

RENEWABLE COST ALLOCATION PROCESSES-AN APPLICATION OF GREEN ACCOUNTING IN ANALYSING GLOBAL ENVIRONMENTAL ISSUES

CHHG Rao, PS Rao, M Srinu, NKM Lakshmi - Turkish Journal of Physiotherapy and ...

CUSTOMERS AND EMPLOYEES INSIGHT TOWARDS SERVICE QUALITY DELIVERY IN PUBLIC SECTOR BANKS

P Sanyasirao, C Harigovindarao, MM Srinu... - Turkish Journal of Physiotherapy ...

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Providing an Optimized and Trusted Route Discovery in Wireless Networks through Secure TORA

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Abstract:

Now a day's security is a one of the challenging issues in wireless infrastructure less networks because in ad-hoc networks nodes moving from one place to another place because of this the topology of the network changes frequently. The changes in infrastructure may cause miscommunication in a network due to this may cause route modification attacks. On other side, packet dropping can be occur by data communication attacks, which will not affect the routing protocol. Temporally ordered routing protocol is one of the MANET routing protocol which is frequently affected by above-mentioned attacks. To avoid the problems some features are add to this basic TORA routing protocol for secure routing. The extensions include authentication means the identification of node is done and integrity means the message modification is not allowed. These features are provided by using one cryptographic secrete key algorithm hashed message authentication code, which gives the information about the sender, receiver and intermediate nodes for authentication and fast data validation and this protection Obtained acceptable results by using network simulator tool (NS2) on considered QOS metrics such as delay analysis, packet deliver ratio, throughput and packet drop. An average of packet drop and delay is decreases after applying the secured TORA protocol and it increases the packet delivery ratio and throughput.

Key words: wireless infrastructure less networks, routing attacks, Destination sequenced distance vector routing, integrity, authentication, and network simulator tool.

1. INTRODUCTION

Now a day's increasing the mobility of computing, which is very important for users. Therefore, users can exchange messages and maintain connectivity while roaming through a wide area. In some areas, the necessary support for the mobile computing is being provide by installing access points and base stations [1, 2]. Users can access this type of mobile connectivity from home, office or while on the road. The wireless mobile networks are collection of mobile devices or nodes that are using wireless communication with infrastructure less or without centralized authority such as base station in wireless LAN.

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Research Article

Automatic Sentiment Analyser Based on Speech Recognition

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Abstract: Analysis of the Emotion of a person has been developed over the earlier period decades. The majority of the works in it spun over text emotion analysis content analyzing strategies. Yet, audio emotion analysis opinion is in the beginning phase of the research network. Our work presents the study of various algorithms of sentiment analysis to identify Emotion by dissecting the acoustic highlights of an individual's voice. The direction of study on datasets and the strategies which are utilized to recognize feeling through voice and actualized the framework to distinguish the best structure for the errand fully expecting and conveying it in a future application.

Keywords: Emotion, Sentiment Analysis, Speaker Recognition, Speech Recognition, Mel frequency cepstral coefficient (MFCC), Chroma, Multi-Layer Preceptor (MLP).

1. Introduction

Emotions square measure cnide states associated with the sensory system welcome on by neuro-physiological changes otherwise connected with concerns, sentiments, conduct reactions, and tier of pleasure or dismay Emotion is nothing however Associate in Nursing expression is a good/negative event that's connected with a selected illustration of physiological development. Peggy Thoits depicted emotions as including physiological segments, social or emo tional labels (anger, stress, and so forth), expressive body exercises, the assessment of conditions and settings.

1.1 Sentiment Analysis

Sentiment Analysis is the translation and characterization of feelings (positive or negative or impartial) inside the given information. It can be done through content, sound, video examination systems. Sentiment analysis is that the analysis of individuals' feelings or behaviour towards a circumstance, speech on points, or by and enormous. Thought assessment is moreover employed in numerous applications. Here, the paper comprehends the perspective of people subject to their speech with all others. For associate degree appliance to understand the mentality or perspective of the people through a discussion. It has to acknowledge World Health Organization is interfacing within the speech and what's spoken. To execute a speaker and speak affmnation system, 1st perform the sensation assessment on the infonnation isolated from previous strategies. Understanding the attitude of people is astonishingly helpful in numerous events. as an example, PCs uill see and react to human non-lexical conespondence as an example, and sentiments. In such a case, leading to recognizing somebody's emotions, the machine will modify the settings satisfying their desires and tendencies. The investigation organize has gone when dynamic sound materials, as an example, tunes examine, news, political disputes, to content. to boot, the system in like manner worked on sound assessment to think about client bolster phone conversations and numerous conversations including quite one speaker. Since there's quite one speaker within the speech, it gets awkward to look at the sound annals. it's needed to recommend a technique that may think about the presenter character and execute sound examination for solitary speakers and report their inclination.

1.2 Related Background Work

Assessment Analysis has to boot alluded as Stunnarbeiteilung, that acknowledges the slant sent in a very book by then assessments it to seek out whether or not repolt imparts positive or negative opinion. a bigger piece of labor on feeling investigation has centered on procedures, as an example, Innocent Bayesian, call tree, reinforce vector machine, most extraordinary entropy. uithin the work, the sentences in every record square measure named as crazy and goal, and a short time later customary Al techniques square measure applied for the passionate

Classification of the DDoS Attack over Flash Crowd with DNN using World Cup 1998 and CAIDA 2007 Datasets

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Abstract

Present day's e-commerce business has tremendously increased as everyone got Internet on their hands through their mobile devices. E-commerce big giants like Amaz with surprise sales with huge discounts on the products called Flash Events (FE) or Flash Sales (FS). It attracts the customers to purchase the product on such specified d into the servers on these days. Based on this scenario, attackers target these networks to degrade the performance of e-commerce portals by generating huge fake ser Service (DDoS) attacks. Network attacks caused during Flash Events (FE), Flash Sales (FS) are considered as Flash Crowd attacks (FC). With FC attacks, the performan affects the clients by not sending proper responses. In this paper, the two datasets to CAIDA and WC 1998 datasets have been considered. WC 1998 dataset deals with fla attack information. Similar features from both datasets have been taken and the flash crowd and DDoS attacks have been classified using the Deep Neural Netw discriminating the DDoS and FC/FE with an accuracy of 70.49 % at 100 epochs and 72.1 % at 1000 epochs has been achieved.

Keywords

Flash Crowd, Flash Event, DDoS, Intrusion Detection, Deep Neural Networks.

How To Cite This Article?

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Turkish Journal of Computer and Mathematics Education Vol.12 No. 11 (2021), 2990- 3000
Research Article

Deep Learning Algorithms for Intrusion Detection Systems: Extensive Comparison Analysis

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Abstract: The network of systems is facing threats from the various attacks, for that a software application needed to regular monitoring the network. Intrusion Detection System (IDS) is application software that monitors the traffic of the network for any unusual activity and raises the alarms when such activity found. The existing IDSs still face troubles in improving the identification accuracy, warning rate not overcoming and identifying mysterious assaults. To take care of the above issues, numerous researcher works going by the researchers have concentrated on creating IDSs that exploit. This survey presents modern approaches in Intrusion Detection System (IDS) applying deep learning models, which have attained great fortune newly, especially in the domain of computer vision, natural language processing, and image processing. In this study, a thorough survey of deep learning methods used by various researches on IDS. This study also proposes a comparison among various deep learning algorithms implemented on KDD Cup, NSL-KDD and UNSW-NS15 data sets.

Keywords: NIDS, HIDS, IDS, Deep Learning

1. Introduction

Today, the quantity of Internet clients is ceaselessly expanding, alongside new system administrations. As the web develops, network security issues have gotten progressively genuine. Numerous security vulnerabilities are uncovered and abused by assaults. Intrusion Detection System (IDS) is application software that monitors the traffic of the network for any unusual activity and raises the alarms when such activity found. However, Network intrusion detection system performance is generally low accurate when it is subjected to new and unfamiliar attacks. The solution for the same can be processed by recording the datasets and almost half of the anonymous attacks on the testing dataset never appear in the training dataset, and it is challenging for all classifiers to detect attacks. The detection of any unknown attack and unknown data type. One of the essential concerns to consider is to make sure the data is clean. On the other hand, prior to the known attacks, we can also detect unknown attacks.

Networks are increasingly influencing modern life, making information security a significant research area. Cybersecurity strategies include, in particular, intrusion detection systems, firewalls, antivirus software. From the internal and external threats, those techniques protect from the networks, and an ID is a form of a monitoring device that plays an important role in helping to protect network security by tracking the software and hardware system that is operating in a network. Several mature IDS products have emerged since then. Nevertheless, most IDSs also Suffer massive false warning levels, producing frequent warnings for low non-threatening circumstances, which enhances the pressure on security analysts and may cause harmful attacks to be missed. Several researchers have thus concentrated on improving IDSs with high recognition levels and reducing false warning rates. A potential issue with current IDSs is the failure to track unexplained assaults. When network dynamics are evolving rapidly, types of attacks and new attacks are continuously emerging. Therefore, the development of IDSs that can identify unknown threats is essential.

The figure 1 below shows, the role of IDS, its place behind the firewall scanning for patterns in network traffic that might intimate malicious activity. Thus, IDSs are used as the next and the final level of defence in any protected network against attacks that breach other defences.

AMA (ISSN: 00845841)

Journal ID : AMA-12-08-2021-10611

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Title : A Deep Learning Technique for Automatic Classification of HSI Land Use and Land Cover images

Abstract :

In the field of remote sensing, Land Use (LU) and Land Cover (LC) classification problem is one of the major formidable tasks. In this paper, we have considered Visakhapatnam City for LU and LC classification. Neural Networks has become a fast enhancing tool in order to accomplish complex tasks in many challenging applications in the field of Artificial Intelligence (AI). Various kinds of Neural Networks are existing nowadays to cater wide range of applications. In this paper, implementation of Convolutional Neural Network (CNN) for a problem is considered. CNN is a kind of Deep Learning technique, which is generally applied to applications related to classification of images, clustering them depending on similarity measure and does object identification within the images. Using CNN, we have performed LU and LC Classification of Visakhapatnam City and attained an accuracy of 95.38%.

FULL ARTICLE

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AMA (ISSN: 00845841)

Journal ID : AMA-25-08-2021-10647

DOWNLOAD [This article belongs to Volume - 52, Issue - 01]

Total View : 332

Title : Mining Regular High Utility Item sets Using Efficient Pruning Techniques From Incremental Databases

Abstract :

High utility itemset mining is the process of producing itemsets that generate high profits. Mining regular high utility itemsets are to discover all high utility itemsets that appear regularly in static databases. In some real-world applications, the itemsets' occurrence behavior may be changed significantly by inserting new transactions into the original database. Regular high utility itemsets mining methods for static databases cannot be applied to incremental databases. An efficient method called RHUINC miner (Regular High Utility Itemset mining for the incremental database) is proposed for discovering regular high utility itemsets from incremental databases. It uses uList structure to avoid the creation of unpromising itemsets. Using uList, it can maintain the itemsets information and provide efficient strategies to generate regular high utility itemsets. Experimental results show that the proposed algorithm is efficient in terms of runtime and memory utilization.

FULL ARTICLE

AMA, Agricultural Mechanization in Asia, Africa and Latin America

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DETECTING TRAFFIC FROM REAL TIME TWEETS

By

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ABSTRACT

At present, one of the major issues for a person to meet their prerequisites is the cluttered traffic. Regardless of the identity, on the off chance that are out and about to face the deal, even if an individual pursues the traffic rules. So as to determine the issue, this paper concentrates on structuring an application to dole out the genuine class mark for every single individual tweet identified with the traffic words. On the off chance that any message contains traffic related data, it will be sent as an alarm to the end clients who are following the present client, or else a similar tweet will be simply posted on the client divider. In advanced times, informal organizations have turned into an intriguing space for each human being to share and convey their ongoing updates with one another. So as to actualize this application, it picks a good online life, which is Twitter.

Keywords: Tweet Classification, Social Networks, Text Mining Technique, Twitter Stream Analysis.

INTRODUCTION

An interpersonal organization is an administration that centers around the building and confirming of online informal communities for networks of individuals who share interests and exercises, or who are keen on investigating the premiums and exercises of others, and which requires the utilization of programming.

A popular small blogging service that has received much attention recently is Twitter. This is one of the Online Social Network (OSN) services that attracted a variety of individual's interest in it in terms of how updated status information can be shared among the friends, family and coworkers (Huberman et al., 2008). On Twitter, each and every message is termed a Status Update Message (SUM), which is just a message to wish friends or colleagues. Till now, there have been a lot of researchers who have published their studies of Twitter to date, especially throughout the past year. Most studies can be classified into one of 3 groups. In the first group, maximum researchers try to analyze the complete network structure of Twitter and they want to calculate the work load that is present for the Twitter application (Java et al., 2007; Tumasjan et al., 2010). In the second group, many researcher try to examine or find out the important characteristics of Twitter application as one of the social medium (Galagan, 2009; Kwak et al., 2010). Finally, the last group of users tries to create new applications to compete the Twitter (Borau et al., 2009; Hightower & Borriello, 2001).

Twitter is categorized as a small blogging service. Micro blogging is a kind of blogging that allows users to send temporary text updates or micromedia like images or audio clips. Micro blogging services alternative than Twitter embody Tumblr, Plurk, Jaiku, identi.ca, etc.

The architecture of Twitter is explained in the Figure 1, where each and every Twitter has a facility to stream the information. For this, Twitter will connect with stream API. Once the Twitter sends any tweet it will be saved into the database with the help of cache table. Now the information which is available in the cache table will be

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Quick and Accurate Forecasting of COVID-19 Cases using Prophet Model

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Abstract

This World requires the support of new technologies like Artificial Intelligence (AI), to face and look ahead the new problems, especially against serious threats like COVID-19. The objective of this proposed work is to utilize the artificial intelligence and its prominent discipline, Machine Learning (ML), as a decisive technology to fight with corona virus disease. In this work, Prophet Model, an open source tool developed by Face book is used to forecast the positive tested cases on a given particular day over Indian population. The proposed model is trained with existing data to find patterns to make forecast about speeding of virus in near future. The model validated with an accuracy of 96.6 % and forecasted the total number of cases for 30 days from June 28th 2020 to July 28th 2020, where the forecasted total number of cases in India reaches 857668 on the 30th day, i.e. by July 28th 2020.

Keywords

COVID-19, Virus Spread, Time series, Prophet, AI, India.

1. Introduction

Coronaviruses are enveloped non-segmented positive-sense RNA viruses having a place with the family Coronaviridae and the order Nidovirales and broadly distributed in humans and other mammals [1]. Coronaviruses are an enormous group of infections that may cause disease conditions in humans or animals. Especially in humans, these coronaviruses are known to cause respiratory-related infections varying from the basic common cold to more severe diseases such as MERS - middle east respiratory syndrome [2, 3] and SARS - severe acute respiratory syndrome [4, 5]. The most as of late found coronavirus causes COVID-19 - corona virus disease -2019 [6, 7].

According to the WHO [8], on December 31 2019, Wuhan observed a lung infection with no details of cause and was reported to WHO country office located in china. As a follow up, this pandemic outbreak was declared as international concerned public health emergency on January 30 2020. This new virus and disease were unknown before the outbreak began in Wuhan [9] till WHO named it as COVID-19 on February 11 2020. Viruses, and the disease caused by that virus, will have different names. For instance, HIV and AIDS are two different names, HIV is the virus and AIDS is the disease caused by HIV virus. Usually people are familiar about the name of a disease than the name of the virus that causes it. The disease and underlying virus of this pandemic are named as corona virus disease - COVID-19 [10] and the virus that causes this disease is severe acute respiratory syndrome corona virus 2 - SARS-CoV-2, for which no particular medical authorities approved medication technique or vaccine till date (June 20 2020).

Studies [11, 12] presented that fever, dry cough, and tiredness are the most usual symptoms of COVID-19 and other side effects that are less typical and may impact a few patients consolidate a throbbing painfulness, nasal blockage, headache, conjunctivitis, sore throat, looseness of the bowels, loss of taste and smell, a rash on skin and recoloring of toes and fingers. These symptoms are commonly delicate and start a tiny bit at a time. A few individuals become contaminated at this point but simply have delicate signs. Majority (about 80%) recover from the disease without requiring special clinical facility treatment. 1:5 (Around 1 out of every 5) people who gets COVID-19 ends up being truly sick. People with hidden issues like hypertension, heart and lung issues and diabetes are at higher risk of sickness. On other hand, there is a chance that in any case, anyone can get COVID-19. It is advisable to look for look for clinical consideration immediately, for those who experience fever or inconvenience breathing/quickness of breath, chest torture/weight, or loss of talk [13].

In spite of the fact that the general casualty rate is assessed to run from 2 to 3%, the sickness can be lethal to old people (60+ age groups) and those with a medical history. Current data proposes that the incubation period, the time period between exposure and the identification of symptoms, of COVID-19 ranges from 1 to 12.5 days, with median estimates of 5 to 6 days, yet can be up to 14 days.

An adaptive hello interval for AODV through ANFIS to improve the performance of MANETs

Article type: Research Article

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Abstract: Mobile Ad Hoc Network is an easily deployable wireless network without any need of centralized infrastructure. The change of position by wireless devicesleadstolinkfailuresandroutefailures.The mobile nodes sent hello messages at regular intervals to update the status of their neighbors. Increasing the number of periodical notifications such as hello messages will give an idea about the topology and at the same moment consumes more network resources. Reducing these periodic notifications results in discovering the neighbors at veryslowrate.Thereforetherateofhellomessages has most significant role while considering the performance of MANETs. Routing Protocols such as AODV in MANETs performs the operation basing on static hello interval. In this paper an adaptive hello interval approach is proposed based on a soft computing technique "Adaptive Neuro Fuzzy Inference system" for in MANETs. The result states that the proposed solution yields a great improvement over the traditional protocol "AODV".

Keywords: AODV, ANFIS, ANFISHIAODV, hello message, MANET, performance

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Intrusion Detection Models Using Supervised and Unsupervised Algorithms - A Comparative Estimation

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Keywords:
data balancing, intrusion detection, machine learning, supervised learning, unsupervised learning

ABSTRACT

Intrusion Detection is a protection device that tracks and identifies inappropriate network behaviors. Several computer simulation methods for identifying network infiltrations have been suggested. The existing mechanisms are not adequate to cope with network protection threats that expand exponentially with Internet use. Unbalanced groups are one of the issues with datasets. This paper outlines the implementation and study on classification and identification of anomaly in different machine learning algorithms for network dependent intrusion. A number of balanced and unbalanced data sets are known as benchmarks for assessments by NSLKDD and CICIDS. For deciding the right range of options for app collection is the Random Forest Classifier. The chosen logistic regression, decision trees, random forest, naive bayes, nearest neighbors, K-means, isolation forest, locally-based outliers are a group of algorithms that have been monitored and unmonitored for their use. Results from implementations reveal that Random Forest beats the other approaches for supervised learning, though K-Means does better than others.

1. INTRODUCTION

The Intrusion Detection System (IDS) is a protection framework that track network activities to verify that network operation is natural. Intrusion Detection System (IDS) Based on the extent, then appropriate steps are taken. The IDS is graded as Missuse and Anomaly in machine-based learning. IDS focused on malfunctioning learns trends from computer processing. Anomaly-based IDS may detect actions that vary from standard network behaviour. IDS based on signature or maliciosis detects proven attacks only, but IDS based on abnormalities will detect new attacks not studied from modeling. In this article, the methods used for machine learning are: regression of logistics, decision trees, random woods, Naãive Bays, K-Nearest neighbors, K-means, insulation forest and local outlier variables.

2. COMPARATIVE STUDY

This paper compares the following algorithms.

2.1 Logistic regression

It is a classification model that uses a logistic function to predict the probabilities of events with the data fit to it. It uses a sigmoid function to map predicted values to the probabilities. The logistic function is used by this model is represented by Eq. (1):

$$\log\left[\frac{p(x)}{1-p(x)}\right] = \beta_0 + x\beta \quad (1)$$

To predict a class that data belongs to, this method uses a threshold value. Based on the predicted value greater than the threshold, it can be classified accordingly.

2.2 Random forest

This paper uses the Random Forest algorithm for classification. It builds a set of N decision trees, each associated with k random number of data samples. For a new sample, make each of the N trees predict the category to which the data point belongs and assign a new data point to the category that wins the majority vote. It is an ensemble method of learning, in which a strong learning group is created from a set of weak learners.

2.3 Decision trees

This paper uses Decision trees for classification. Decision trees split the data using if-then-else conditions of the features. The decision tree's core components are a branch, a leaf node, and a decision node. Classification begins at the decision node, tests the features guided by that node, going down the tree at that point, then comparing the estimation of the features in the given sample. For attribute selection at each decision node, it uses one of the techniques called information gain using entropy, gini index.

2.4 Naïve bayes

Naive bayes method is based on applying Baye's theorem, with the "naive" assumption of conditional independence between every pair of features given the value of the class

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Key Pre-Distribution Protocol for Node to Node for Wireless Sensor Networks

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ABSTRACT

In a variety of fields, including military, environmental monitoring, hospitals, and a variety of hostile environments, sensor networks are in demand. It is also used in Internet applications where a wide range of sensors are connected via the internet. These applications require security concerns, such as confidentiality, authentication and integrity because of their deployment areas and sensitivity to the data. Given these considerations, key management in many of the information security solutions used for data security plays an important role. The suggested key management exploits several vulnerabilities in the sensor network and uses the proposed key distribution system to respond to various sorts of vulnerabilities solutions. Use a key pool matrix to generate and distribute key. The proposed key management requires fewer communication and storage space at each sensor according to the comparison and analytical analysis. In addition, the proposed work can increase resilience and reduce key compromises and decrease the number of cancellation operations in comparison with other schemes.

Keywords
Security in wireless sensor networks, Key management, Network Attacks, Node capture attack.

Introduction

A collection of autonomous sensor nodes is spatially placed in WSN. The resources such as memory, communications and energy are restricted in these networks. In addition, WSN is a huge collection of sensor nodes and by default sensors are not tamper resistant to security attacks. This means that WSN is more sensitive to attacks on security. The addition of tamper resistance raises the cost of the sensor node, resulting in an expensive network. Hence many researchers are working on best security mechanisms to protect the most vulnerable networks link WSN. The tiny nodes in the network demand the lightweight solutions with high level security. The strength of any encryption-oriented security mechanism directly depends on the type of key used. Wired network solutions are not suitable to use in WSN because of their constraints in resources. If key management is not good enough to distribute the keys among sensor nodes in the network, then the entire network communication may be vulnerable. Existing KMS for hierarchical WSN architecture is either supports node to node communication or group communication. Using a key pool matrix, our proposed KMP supports both node-to-node and group communication. Our scheme's primary goal is to improve secure data communication while also ensuring efficient key generation and administration. The suggested system achieved full key connectivity, efficient node revocation, perfect resilience, less communication during key establishment, and reduced storage overhead.

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Performance Analysis Of Hyperpipes In The Classification Of Large Datasets

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ABSTRACT

Data mining is a study of identifying and obtaining the necessary knowledge from the huge amount of data. Classification is a technique that describes the model by finding the unknown class label of the data object. This paper represents Hyperpipes as a simple technique used for faster classification. The aim of this paper is to analyze the performance of Hyperpipes on different large data sets. For this study, five datasets have been taken from publicly available UCI machine learning repository web site. Results show that this model can be efficiently utilized in the classification of huge datasets which contains a large number of attributes and instances. This model achieves a better accuracy of 98.95% by overcoming the maximum accuracy of 84.15% and minimum accuracy of 39.23% from the data sets.

Index terms
Data mining, Classification, Hyperpipes, UCI, Performance.

I Introduction

Data mining is an art of developing interesting patterns and mining some useful knowledge from the huge amount of data. This Data mining is also known as Knowledge Discovery Process. The hidden knowledge in the large amount of data is extracted from this Knowledge Discovery Process. The value of data has improved with the development of some data discovery techniques. There are different types of methods which are already in use to extract patterns from the stored data which are valuable and previously unknown. This type of information can be Predictive or Descriptive. The basic task of this process is to obtain information from low level databases. Data mining methods are applied for extracting the knowledge from raw data in KDD process[26]. This KDD process is defined in multiple steps that help in converting of data into useful information. The steps in Knowledge Discovery Process are described as follows.

1. **Selection:** In this step, the dataset is selected and the domain is recognized from the data which is to be extracted.
2. **Preprocessing:** During this stage, the selected data may contain some noise and missing values. This type of data may create outliers or irrelevant data and should be removed by cleaning.
3. **Transformation:** In this phase, the nominal data are converted into numerical and are standardized by defining new attributes. Here at this time, the data is managed by various data mining techniques like classification, regression and clustering.
4. **Data Mining:** Data mining is an art of developing interesting patterns and mining some useful knowledge from the huge amount of data.

Analyzing Modal Shift of Commuters Due to Proposed BRTS- Amritsar

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Abstract: Current Modal Split: Start by understanding the existing modal split in Amritsar. This involves identifying the percentage of commuters using various modes of transportation such as private cars, motorcycles, bicycles, buses, and walking. This information can be obtained through surveys, transportation department data, or relevant research studies.BRTS Features: Evaluate the proposed BRTS system in terms of its key features, including dedicated bus lanes, high-frequency service, convenient station locations, comfortable buses, reliable schedules, and attractive fare structures. These features are important to attract commuters to shift from their existing modes of transportation.Benefits of BRTS: Identify and communicate the potential benefits of the BRTS system to the commuters. These may include reduced travel time, improved reliability, enhanced comfort, decreased congestion, environmental sustainability, and cost savings. Public awareness campaigns and outreach programs can play a crucial role in conveying these benefits to the public.

Keywords:.BRTS Features, high-frequency service.

Introduction: Accessibility and Connectivity: Assess the BRTS system's connectivity to major residential, commercial, and educational areas in Amritsar. Analyze how well the proposed BRTS routes align with the travel patterns and demand of commuters. Ensure that the BRTS system integrates effectively with other modes of transportation, such as feeder bus services, park-and-ride facilities, and pedestrian infrastructure. Cost and Affordability: Compare the costs of using the BRTS system with other modes of transportation, particularly private vehicles. Analyze the affordability of the BRTS fares for different income groups. It is important to make the BRTS system economically viable and accessible to a wide range of commuters.

Perceived Safety and Security: Evaluate the perceived safety and security of the BRTS system. Commuters are more likely to shift to the BRTS if they feel safe while using the system, both in terms of personal safety and the security of their belongings. Behavior Change: Consider the potential barriers to modal shift and strategies to encourage behavior change. Some commuters may be resistant to change due to habit, convenience, or perceived disadvantages of the BRTS system. Implement strategies such as awareness campaigns, incentives, and education programs to encourage a positive shift in commuter behavior.

Continuous Monitoring: Establish a mechanism to monitor the modal shift after the implementation of the BRTS system. Regular surveys, data collection, and analysis can help assess the success of the BRTS in attracting commuters from other modes of transportation.

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A review on fruit recognition and feature evaluation using CNN

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ABSTRACT

The first thing addressed in this paper is Plant fruit recognition and its feature extraction, it plays vital role in Agriculture. The point is to construct an exact, quick and solid framework utilizing CNN realities. Automatic fruit detection may reduce human efforts (counting number of fruits and manual identification). The second thing addressed in this paper is plant classification to avoid similarities in many plant fruits. Fruit classification may help fruit sellers to identify and to differentiate various kind of fruits having same similarities. The proposed framework has applied convolutional Neural Net (CNN) to the undertakings of distinguishing natural fruit pictures. In any case, deep learning has been shown as of late to be an extremely incredible picture identification procedure, and CNN is a best in class way to deal with deep learning.

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1. Introduction

Fruits are normal food devoured by human since ancient period [1]. They make significant dietary commitment to human prosperity on account of their high nutritive worth [2]. It is need to guarantee the nature of Fruits that are burned-through in any spots. To do this, Fruits product location framework can be set up that can perceive different sorts of Fruits from pictures that are caught by any computerized camera or advanced mobile phone from different spots [3]. This framework will assist us with checking the nature of leafy foods assist us with fostering an automated collecting framework from plantations [4]. To foster the framework, DL methods have utilized in this framework [5]. Exact and effective Fruits product location is of basic significance for a machine [6]. Various elements make Fruits product discovery framework a difficult undertaking: Fruits happen in scenes of changing brightening, can be killed by different items and are at times hard to outwardly separate from the foundation [7]. An optimal natural fruit identification framework is exact, can be prepared on reachable informational collections, creates its expectations progressively, adjusts to various sorts of different leafy foods utilizing various modalities, for example, infrared pictures and shading pictures [8]. As of late, Deep learning strategies have gained significant headway in tending to these prerequisites. Natural fruit identification can be thought of and planned as a picture division issue [9]. The proposed framework has utilized Convolutional Neural Networks (CNN) for recognizing Fruits product data framework various pictures [10]. The proposed strategy is attempted to conquer every one of the restrictions of the connected works of Fruits identification discovery framework and get a high exactness as opposed to different works [11]. The framework has given execution straightforwardness and proficiency [12]. The commitments of this paper are consequently

- To foster an elite natural product discovery framework that can be immediately prepared with few pictures utilizing a CNN.
- To examine the exhibition of the convolutional neural organizations for recognizing objects of pictures.
- To realize how to construct a natural product recognition framework utilizing DL approaches dependent on convolutional neural organizations.
- To improve the identification quality utilizing deep convolutional neural network contrasted with help vector machine (Fig. 1).

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Performance Analysis Of Brain Tumor Detection Using Deep Learning And Machine Learning Models

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Abstract

Now A Days For Identifying Or Predict Any Diseases On Human Beings, We Should Have Proper Diagnosis For Predicting The Disease Which Is Present In That Human Body. In General For Prediction Of Diseases We Try To Use Either Ct Or Mri Scan Techniques For Taking Decision On That Appropriate Disease. In General Medical Person Need Complete Knowledge On That Appropriate Domain To Find Out The Abnormality Which Is Present In Human Beings. In This Present Article We Try To Discuss About The Brain Tumor Detection By Using Deep Learning And Machine Learning Models And Try To Find Out Which Mri Image Is Having Benign And Which Images Are Having Malignant . In Recent Days There Was Tremendous Success Of Ml Algorithms At Image Recognition Tasks And This Is Increasing Day By Day Because Of Electronic Medical Records And Diagnostic Imaging. If We Use Basic Ml Algorithms To Predict The Abnormality, This May Take Lot Of Time Complexity And Accuracy May Be Very Less. Hence In Our Current Application We Try To Develop The Model Using Cnn Deep Learning Architecture And Try To Show That Proposed Cnn Model Has High Efficiency And Accuracy Compared With Previous Ml Models. In This Current Article We Try To Discuss About The Key Research Areas And Applications Of Medical Image Classification, Localization, Detection, Segmentation. We Conclude By Discussing Research Obstacles, Emerging Trends, And Possible Future Directions For Improving Some More Advancement.

Keywords:
Machine Learning Algorithms, Deep Learning, Mri Images, Ct Scan, Segmentation, Localization, Image Classification.

1. Introduction

In Recent Days, The Introduction Of It And E-Health Care System In The Medical Field Try To Provide Medical Experts To Give Proper Treatment For The Patients Who Are In Emergency. In General For Finding Any Abnormality Present In The Human Brain, We Need To Address The Problems Which Are Arise While Segmentation Of Abnormal Brain Tissues And Normal Tissues Such As Gray Matter (Gm), White Matter (Wm), And Cerebrospinal Fluid (Csf) From Magnetic Resonance Images (Mri).These Are Mainly Extracted By Using Proper Segmentation Techniques On That Medical Images In Order To Extract The Main Features Which Are Required To Identify The Benign And Malignant Status Of The Human Brain[1].

In General A Tumor Is Basically An Uncontrolled Growth Of Cancer Cells Which Is Formed In Some Region On Brain And This Tumor Part May Be Some Times Benign Or Malignant. The Benign Brain Tumor Is One Which Does Not Contain Any Active (Cancer) Cells And This Is Harmless For That Human Being. Whereas Malignant Brain Tumors Have A

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Research Article

Applying assertion Medical Diagnosis Forecasting with carrier testing using Multiple Machine Learning Algorithms

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ABSTRACT:

AI is frequently seen as complex innovation available simply via prepared specialists. This forestalls numerous doctors, researcher from utilizing this device in all their research.. The primary target of this paper is to eliminate the obsolete perception to get better results.

We declare the new improvement of auto AI strategies empowers biomedical analysts to rapidly construct cutthroat AI classifiers without needing top to bottom information about the fundamental calculations. We study and investigate all the cases of forecast the danger of cardiovascular and some other sicknesses. To help our case, we analyze auto AI strategies against an alumni student using several important grades, including the total amounts of time required for building machine learning models and the last characterization correctness's on inconspicuous test datasets.

Specifically, the alumni understudy physically assembles various AI classifiers and tunes their boundaries for one month utilizing the sci-pack learn library, which is a well known AI library to acquire ones that perform best on two given, freely accessible datasets. We run auto machine learning library called autos learn on the same datasets and execute them. Our experiments find that automatic machine learning takes one hour to produce classifiers that perform better than the ones built by the graduate student in one month. More importantly, we build this classifier only need a few lines of standard code.

Our findings are expected to change the way of physicians see machine learning and encourage them in wide adoption of Artificial Intelligence (AI) techniques in clinical domain.

INTRODUCATION:

Machine learning and artificial knowledge (AI) have seen huge advance in the over a long time (five years) . Simulated intelligence(AI) calculations have obtained significant interest from clinical analysts. As an example, a recent overview indicates that almost 50% of the talked with medical care associations are utilizing or intending to utilize artificial intelligence in imaging.

Unfortunately, developing machine learning algorithms traditionally need a critical sum of time and understanding of how the underlying algorithms work. For example, modulate and training of deep neural networks extract weeks to months. Most state-of- the- art deep networks have been manually planned by human specialists who have proceed degrees and long-term training in computer science and artificial intelligence.
Such necessities represent an extraordinary opposition for clinical analysts who need to utilize AI apparatuses to approve significant biomedical inquiries.

Motivated by this constraint, specialists as of late study more computerized AI methods These structures and techniques are all in all known as Auto Machine Learning (AutoML).The plan and design is to computerized the way toward building an AI model that gives serious exhibitions on any given dataset. This incorporates robotization of information pre-handling, include extraction, hyper-boundary modulate, and algorithm selection. Here, a feature procedure a reduced vector containing data about the info information fundamental for making the last forecast. The rise of AutoML is possibly reevaluating to the biomedical and clinical spaces. By eliminating the high specialized boundary, AutoML could empower doctors to use AI strategies all the more extensively in their work and examination. AutoML can be considered as the start to finish cycle of looking for the best AI model arrangement on a self-assertively given dataset. Every setup is the consequence of making several choices regarding which algorithm, optimization method, or hyper-parameter to use. Due to the huge number of configurations in the search space, finding the best model is computationally expensive.

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An efficient mechanism using IoT and wireless communication for smart farming

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Signal strength

ABSTRACT

IoT sensors are able to aggregate data regarding their agriculture field in real time have given rise to the concept of smart farming. The agricultural sector is of great importance to fulfill food resources need of the country. Most industries, including "smart agriculture," have been completely redone in light of new internet-of-things (IoT) technologies that brought in new quantitative approaches. Such revolutionary changes are upending traditional agricultural practices and presenting new opportunities in the face of a variety of challenges. Agricultural applications involving wireless sensors and IoT devices are analyzed in detail. For agriculture-specific use, such as soil grounding, harvest position, irrigation, bug & insect discovery, a list of available sensors is provided. In this article, we proposed a WSN framework based on the Internet of Things for use in smart agriculture, with different design levels to choose from. The first step is having sensors on the farm which are capable of collecting relevant data and determining the appropriate cluster heads. In addition, the signal strength on the communication link is calculated by means of the signal to noise ratio (SNR) in order to attain reliable and competent information diffusion over long distances. Second, the recurrence of the linear congruential generator is used to ensure the security of information spread as of agricultural sensors to base stations (BS) by means of the linear congruential producer. Comparing the proposed framework to other solutions, the simulation results showed that it significantly improved communiqué routine by standard of 16.3 percent in system throughput, 36.3 percent in packet drop ratio, 12.4 percent in network latency, 18 percent in energy consumption, and 19 percent in routing overheads.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Nanoelectronics, Nanophotonics, Nanomaterials, Nanobioscience & Nanotechnology.

1. Introduction

The Internet of Things (IoT) has mainly exciting improvement in the field of information and communication technologies (IoT). Despite the fact that networking technologies have become more widely used as time has progressed, they were initially controlled to linking conventional ending customer devices for example mainframes, desktop computers, and laptop computers, as well as newly developed smart phones &tablets, among other equipments. According to industry analysts, almost Nine billion such devices at present associated to the system, with the number expected to grow to more than 25 billion by 2020, based on their estimates of the current state of the network. According to some experts, the IoT is expected to generate $13 trillion in revenue by 2025. Because IoT is already being used in every sphere of life, it can be found in everything from smart homes to healthiness to traffic control to smart farming [1]. Smart farming is a form of modern agricultural management that integrates advanced technology for example big data and IoT to allow agricultural businesses to keep track of, monitor, and automate their operations. Intelligent farming is also referred to as intelligent agriculture. With a projected increase in the global population and an anticipated rise in food demand, smart cultivation is fetching ever more significant. The issues associated with climate change necessitate

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RESEARCH ARTICLE

Grain Yield Estimation in Cultivated Land Using Machine Learning Techniques

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ABSTRACT

Agriculture contributes approximately 28 percent of India's GDP, and agriculture employs approximately 65 percent of the country's labor force. India is the world's second-largest agricultural crop producer. Agriculture is not only an important part of the expanding economy, but it is also necessary for our survival. The technological contribution could assist the farmer in increasing his yield. The selection of each crop is critical in the planning of agricultural production. The selection of crops will be influenced by a variety of factors, including market price, production rate, and the policies of the various government departments. Numerous changes are required in the agricultural field in order to improve the overall performance of our Indian economy. By using machine learning techniques that are easily applied to the farming sector we can improve agriculture. Along with all of the advancements in farming machinery and technology, the availability of useful and accurate information about a variety of topics plays an important role in the success of the industry. It is a difficult task to predict agricultural output since it depends on a number of variables, such as irrigation, ultraviolet (UV), insect killers, stimulants & the quantity of land enclosed in that specific area. It is proposed in this article that two distinct Machine Learning (ML) methods be used to evaluate the yields of the crops. The two algorithms, SVR and Linear Regression, have been well suited to validate the variable parameters of the continuous variable estimate with 185 acquired data points.

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Introduction

In the field of agriculture, technologically driven solutions have been implemented in recent history.

Most of the field work was carried out by expert's experimentation in the laboratories. In recent times, however, a trend is to grow a culture of data analytical results which is used to identify issues that hinder the sector and ultimately curate the correct information to identify the contributory factor which leads to plant health deprivation.

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MESSAGE PASSING USING CRYPTOGRAPHY AND STEGANOGRAPHY

By

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ABSTRACT

The main aim of this paper is to make sure that the message which is sent from the sender to the receiver side is not accessed by any intruder. To ensure that the message is reached safely, we are first using cryptography followed by steganography, that is first the message will be encrypted with the help of the proposed encryption algorithm. Later, the encrypted message is hidden in an image (QR code) and this message is sent to the receiver side for decryption. To the best of our knowledge, the techniques discussed in this paper have not been tried out anywhere, at least in the combination we as a team have implemented. The idea is simple: firstly, the message is encrypted using the algorithm we have developed. The encrypted text is of double the length of the original message, and is jumbled. This helps in fooling the intruder further. The encryption is based on a key generated from a password. Two levels of authentication exist: password, and the key generated based on the password, which will enhance the security of the message. Secondly, we hide the message in the QR code. QR code is generated using Python language. We have generated QR code in three different extensions, they are SVG, EPS and PNG. On the receiver's side, the text is extracted from the QR code and is decrypted. Usage of the QR code is comparatively more reliable, and the limit of the encrypted message hidden in the QR Code has been validated. The whole idea was implemented and tested in Linux environment.

Keywords: Quick Response Code, Uniform Resource Locator, Compiler, Public Key Infrastructure, Pretty Good Privacy (PGP).

INTRODUCTION

Cryptography is the art or science of transforming plain intelligible data into unintelligible data and then decrypting it back into its original form. It ensures confidentiality, accuracy and integrity. Decryption is the process of transforming encryption text into plain text. Encryption is the process of transforming plain text into an incomprehensible format or cyphertext (Babu et al., 2010; Johnson & Jajodia, 1998).

Both sides utilise the same key in symmetric key cryptography (Secret Key Cryptography). Two separate keys are used in asymmetric key cryptography (public key cryptography). Users obtain the key from a Certificate Authority. It is more secure and efficient in terms of authentication (Channalli & Jadhav, 2009).

Steganography is the art and science of composing messages in such a way that the existence of the communication is concealed. For thousands of years, it has been used in many forms. Data hiding techniques have become more important in the computer age, and they serve security, especially the authenticity and integrity of a message in the context of computer-assisted communication.

Steganography is frequently confused with cryptography since both are used to safeguard sensitive information in similar ways. Unlike cryptography, where it is permissible to discover and intercept communications without violating

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Statistical Analyses in Effective Usage of English Grammar of Engineering Students in Communication

Siva Satyanarayana J, S.Adilakshmi

Abstract: Computer Science Engineering students require good command over English language to get the right placement after the course. Many fail to get the employment as they are not good at communication. English Grammar plays a vital role in making one to confident in their communication. The present paper focuses on statistical analyses of deviations in English grammar of computer science engineering students in coastal Andhra region. The analyses will help the students to concentrate on their mistakes well as the faculty members to minimize the deviations.

Keywords : Deviations, statistical analysis, employability skills, communication.

I. INTRODUCTION

Andhra Pradesh Is The First State In India To Come Into Existence On The Linguistic Basis In The Year 1956. The Native Language Of This Region Is Telugu Which Belongs To The Dravidian Family Of Languages. Along With Telugu Language, Some Other Languages Such As Urdu, Hindi, Sanskrit, Kannada Are Also Spoken In This Region. English Is The Second Official Language In Andhra Pradesh. In Professional And Technical Education, English Is Only The Medium Of Education. In Engineering, English Language Plays Significant Role Especially, At The Time Of Campus Drives. As Multinational Companies (Mnc) Visit Colleges For Recruitement, They Prefer The Students With Good Language Skills. Many Of The Students Fail To Get Throgh The Interviews Only Because Of Language Barrier. Deviation Is One Of The Barriers For The Students.

The Paper Studies The Statistical Analyses Such Grammatical Deviations In The Language Of The Students. The First Section Deals With The Introduction, Followed By Literature Review In The Second Section. The Third Section Deals With The Methodology Whereas The Fouth Describes The Analyses. The Final Section Concludes The Paper.

Methodology:

Revised Manuscript Received on December 30, 2019.
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II. LITERATURE REVIEW:

Deviation is term used to describe spelling and pronunciation of a word or sentence structure which does not confirm to a norm (Richard and Plat 1985). Qin iubai (1997) pointed out that "man will choose the most suitable language form to express their ideas according to the subjective or objective factors during the communication. Because of this choice, the deviations generally occur in the statements. As there are number rules in grammar, there will be number of deviations too in the grammar. One important feature of the grammatical deviation is the case of ungrammaticality such as "I does not like him" (Leech 1969)

III. METHODOLOGY

The objective of the present paper is to analyze the grammatical deviation in English language of the engineering students.

Choice of the Respondents

Fifty students who are studying the final year B.Tech are chosen for the present study. All the students belong to Affiliated colleges of Andhra University from the three districts of Coastal Andhra. Normally, in the first year students do not pay much attention to English, as their focus is entirely on the engineering subjects. Contrary to this, in the final year, the students start looking forward to facing interviews and seeking a good job, for which a good command of English is necessary. For this reason, most final year students focus more on English and practice speaking it. Hence, the final year students have been chosen for this study with a view to finding the percentage of deviations in their grammar. .

Instrument

The instruments which are used in this study are two questionnaires and analysis devices.

Questionnaire:

In order to get the data from the respondents to find out the analyze the deviation in grammar, the researcher administered the following questionnaires.. The researcher has prepared the list of the questions. The chosen questions are frequently asked in various interviews.

1. Could you please introduce yourself?
2. Who is your favorite person? Say a few words about that person.
3. What is the dream in your life? How do you want to realize your dream?
4. How do you want to celebrate your birthday?

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ON A CLASS OF SP-KENMOTSU MANIFOLDS ADMITTING THE QUARTER-SYMMETRIC METRIC CONNECTION

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Abstract

We consider semisymmetric and pseudosymmetric SP-Kenmotsu manifolds admitting the quarter-symmetric metric connection and prove the non-existence of pseudosymmetric SP-Kenmotsu manifolds with respect to the quarter-symmetric metric connection. At the end, we construct an example of 3-dimensional SP-Kenmotsu manifold admitting the quarter-symmetric metric connection and show that it is semisymmetric and its scalar curvature is constant with respect to the quarter-symmetric metric connection.

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Linear programming problem applications in engineering curriculum

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ABSTRACT

The goal of this paper is to submitting linear programming methods and the applications in Engineering Education through Scientific approach in the Curriculum. In solving Linear Programming and Optimization Problems we utilized operation research techniques and according to gathered data, the decision making was recognized systematically and linear programming model was formed after model solving and execution it in academic semesters and comparing the results with the previous semester,

Keywords— *Scientific approach, Optimization problems, Decision making, Research techniques*

1. INTRODUCTION

Linear programming is one of the compulsory subjects for students of mathematics education in order that students can apply mathematics in solving real problems. Provision of this course is also based on several reasons. Firstly, all the problems in real life can be modelled into a math problem. Secondly, LP is included in applied mathematics which contains steps systematically to solve optimization problems in various sectors, including the education sector. Some applications of LP are to solve problems in the field of education, it can be seen as the allocation of student majoring Scheduling problems. Determines the location of the test material and mapping mathematical abilities of students In general, LP problems have three or more variables solved by the simplex method Solving LP with this method is done with some iteration to obtain optimal results.

The more variables and constraints will be, the more iterations are performed. Consequently, learning becomes problematic for students of mathematics, namely the lack of interest in solving LP. Therefore, innovation is needed in learning it, so that the goal of the lecture can be achieved well. The aim of this study is to solve LP with multimedia software so that students will get easier to develop others multimedia to solve the problem LP, increase students' interest and creativity, and the aim of lecturing can be achieved well. Linear programming (LP) is a general technique which allows modelling a great range of problems, in particular, problems arising in the field of Industrial Engineering.

That is why LP draws remarkable importance in mathematical methods for Industrial Engineering students in Universities. In this paper, it present a program which has been devised to improve the learning of methods involved in solving linear programming problems. The main novelty of the program consists of those modules which allow the user to follow in different degrees of detail the operations involved in achieving the optimal solution to the problem at hand. The user can examine in detail the effects of making right or wrong choices with regard to the rules involved in solving an LP problem. Both students at home and the professor in class can take advantage of the program.

1.1 Application oriented multimedia

At the beginning of the history of education, teachers are only one as a medium of learning. In the modern era, the teachers have realized that everything can be used as a medium of learning, including the school environment and at the end, namely computer. Learning media is something that can be used to deliver a message from the sender to the receiver so that the learning process will occur. Media are physical means which are used to send messages to the students and stimulate them to learn.

Learning Media is a combination of hardware and software. There are several types of media that is media graphics, audio and multimedia. Graphic media is a media using visual symbols, such as sketches, graphs, flow charts or other. Audio media is a medium that is associated with the sense of hearing. Multimedia can be defined as an interactive communication system and combination from the data operators, such as the internet and software. Multimedia is a media associated with the use of technology like computers and software. The advantageous of multimedia in teaching is to increase students' learning experiences make time efficiency, create a conducive learning environment actively participate in the learning process and improve students' enthusiasm and performance.

Catalytic activity of supra molecular self-assembledNickel (II) coordination complex in synthesis of indeno-pyrimidine derivatives

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Abstract:

A supra molecular self-assembled Ni(II) coordination complex, formulated as $[Ni_2(2,6\text{-}pydc)_2(\mu\text{-}4,4'bpy)(H_2O)_4].2H_2O$ (2,6-pydc: pyridine-2,6-dicarboxylic acid, 4,4'bpy:4,4'-bipyridine) was synthesized under hydrothermal condition and characterized by single crystal X-ray diffraction, elemental analysis, FT-IR, powder X-ray diffraction and thermo gravimetric analysis. Single crystal X-ray diffraction analysis reveals that the complex crystallizes in the monoclinic space group $P2_1/c$ with cell parameters a=10.5237(6) Å, b=20.1966(10) Å, c=7.2366(4) Å, β=106.96(1°), V=1471.22(314) $Å^3$and displays a 3D supramolecular network through hydrogen bond and C-H···π, C-O···π interactions. Nickel(II) metal species in the structure possess coordinately unsaturated centers, which exhibited viable catalytic properties in the synthesis of five different indeno-pyrimidine derivatives through one-pot reaction involving aldehyde,indane-1,3-dione and guanidinium chloride in a green approach. With the reaction achieved in 15min time interval in ethanol in excellent

UGC APPROVED JOURNAL No. 48514

THE SIGNIFICANCE OF ACTIVITY BASED LANGUAGE TEACHING ON ENGINEERING GRADUATES FOR EMPLOYABILITY: A STUDY

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ABSTRACT

In this paper, I would like to emphasize the importance of language teaching for goal setting and inculcating the employability skills in the budding engineers. It is one of the subjects which act as a media of communication around the globe. For professional students, language fluency is quite essential both in academics and career. It acts as a link language in various domains like international business, medicine, information technology, research and development etc. Engineering graduates must improve the accuracy in English language in order to pursue higher studies in the best universities abroad or to settle abroad by taking up standard tests like IELTS, TOEFL which proves the language proficiency of the students. In the present competitive world, every company looks for the graduates who are good at communication skills along with technical knowledge. The present study aims at investigating the students' employability skills. The holistic development of a student depends on the teaching methodology. Hence, the study focuses on the need and importance of activity based language teaching and difficulties faced by a language teacher while implementing in the classroom.

Keywords: *Activity Based Language Teaching, Language Fluency, Link Language, Employability Skills, Method of Teaching.*

Introduction

Education is one of the most important missiles in achieving the developmental goals of an engineering graduate. English is one among those subjects which is an essential element of education. English is a skilled subject which develops various skills and provides opportunity for the professional growth of an individual. In present day English has become great significant language for every field of life. In this context for learning this language there are so many teaching skills, methods and techniques involved. English language is a skilled subject which contains the different skills such as communication skills and language skills. While learning this language student and teacher role is very much required to teach effective manner and also make the students feel fascinated to learn in better way. There is need for language laboratory to do continuous practice of various activities and to improve language skills such as LSRW skills. These skills can learn and improve through involving teaching methods and techniques in English class rooms. Hence, to develop the language skills of all among the engineering graduate, the Activity Based Teaching (ABT) method is very essential at their first year level onwards.

What is Activity Based Teaching Method?

Activity based teaching is a student centered learning and it is an approach adopted by the teachers to bring effective learning experience for students. It is very important method of teaching to develop curiosity, creativity among students. In this method learning by doing is the main object. The purpose of ABT method is to asset the acquisition of knowledge, skills and great experience. It allows the students and teachers to be alert in the teaching learning process both emotionally, physically and mentally as well as it creates the happy relationship between

View article

Ramappadu Kakita

Impact of Socio-Psychological Factors on English Speaking Abilities of Engineering Courses Aspirants from Rural Foundation

Authors Ramappadu Kakita & Dr. Vijayababu Palukuri

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Superparamagnetism in $Bi_{0.95}Mn_{0.05}FeO_3 – Ni_{0.5}Zn_{0.5}Fe_2O_4$ multiferroic nanocomposites

B. Dhanalakshmi [a, b], K.V. Vivekananda [a], B. Parvatheeswara Rao [b], P.S.V. Subba Rao [b]

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Abstract

Multiferroic nanocomposites of $x.Bi_{0.95}Mn_{0.05}FeO_3 + (1\text{-}x).Ni_{0.5}Zn_{0.5}Fe_2O_4$, for x values of 0, 0.2, 0.4, 0.5, 0.6, 0.8 and 1, have been fabricated using sol-gel autocombustion and solid state methods. Structural and microstructural studies reveal the formation of parent phases of perovskite and spinel, while ensuring proper mixing of two phases by showing clear grain growth in the composites, respectively. Magnetic (M-H loop) measurements show that there is an enhanced magnetic order in the nanocomposites. Besides, the investigated nanocomposite materials exhibit superparamagnetic behaviour with small coercivities in the order of 3–29 Oe in all the samples. This may be due to strong influence of both the phases on one another to modify the anti-ferro magnetic (AFM) order in manganese doped bismuth ferrite. The observed magnetic behaviour was attributed to nanoparticle nature of the composites. In order to ensure the same, crystallite sizes were estimated using Langevin distribution function as well as X-ray diffractometry (XRD), which lie in the range between 28.51 and 55.43 nm, and the obtained results show a good agreement between them. The interpretations of these results are obviously evolved from the structural contributions for ferroelectricity, antiferromagnetic spin spiral cycloid structure around the FeO_6 octahedra, weak ferrimagnetic exchange interactions between the cations located at A- and B-sites and the possible interplay between different ferroic orders.

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Dr. K.V. Vivekananda

Superparamagnetism in Big Mnog FeO3–Nio, Zn, FeO4, multiferroic 價) nanocomposites Check for

著者 B Dhanalakshmi, KV Vivekananda, B Parvatheeswara Rao, PSV Subba Rao

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説明 Langevin distribution Crystallite size Superparamagnetism two phases by showing clear grain growth in the composites, respectively. Magnetic (MH loop) measurements show that there is an enhanced magnetic order in the nanocomposites. Besides, the investigated nanocomposite materials exhibit superparamagnetic behaviour with small coercivities in the order of 3–29 Oe in all the samples. This may be due to strong influence of both the phases on one another to modify the anti-ferro magnetic (AFM) order in manganese doped bismuth ferrite. The observed magnetic behaviour was attributed to nanoparticle nature of the composites. In order to ensure the same, crystallite sizes were estimated using Langevin distribution function as well as X-ray diffractometry (XRD), which lie in the range between 28.51 and 55.43 nm, and the obtained results show a good agreement between them. The interpretations of these ...

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関連記事

PRINCIPAL
VIGNAN'S INSTITUTE OF
Information Technology (A)

A NOVEL TRANSPORTATION APPROACH TO SOLVING TYPE - 2 TRIANGULAR INTUITIONISTIC FUZZY TRANSPORTATION PROBLEMS

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Abstract

In this article we propose a new transportation strategy to achieve an ideal answer for triangular intuitionistic fuzzy transportation problem of type – 2 i.e., limits and requests are considered as real numbers and the transportation cost from cause to objective is considered as triangular intuitionistic fuzzy numbers as product cost per unit. The proposed method is solving by using ranking function. The appropriate response system is delineated with a numerical model.

Keywords: IFN, TIFN, IF Optimum solution, TIFTP of type-2.

I. Introduction

In genuine world, there are general complex circumstances in each field, in which specialists and chiefs battle with uncertainty and hesitation. In useful circumstances, assortment of fresh information of different boundaries is troublesome because of absence of precise interchanges, mistake in information, market information and consumer loyalties. The data accessible is some of the time ambiguous and inadequate. The real-life problems, when defined by the decision maker with uncertainty leads to the notion of fuzzy sets. Due to imprecise information, the exact evaluation of participation values is not possible. Moreover, the evaluation of non-participation esteems is consistently impossible. This prompts an in deterministic climate where dithering endures. Managing estimated data while deciding, idea of fuzziness was presented by Bellman and Zadeh [6]. K. T, Atanassov [4] presented idea of Intuitionistic fuzzy set hypothesis, which is more able to manage such issues. B. Chetia and P. K. Das [1] demonstrated a few outcomes on intuitionistic fuzzy delicate network. Intuitionistic fuzzy sets [5], [7], [8] discovered to be exceptionally powerful in managing ambiguity, among a few higher request fuzzy sets. S.K. Singh, S.P. Yadav [9] proposed their strategies to address case 2 sort of intuitionistic fuzzy transportation problem (IFTP) for example IFTP of type-2. G. Gupta and A. Kumara [3] a capable technique was introduced in which limit and request factors are taken as TIFN's utilized in this article to tackle mathematical model. This paper proposes another transportation strategy for tackling TIFTP of type – 2 by applying ranking function found in [2].

Document details - Designing of band-notched UWB antenna and analysis with C-Shaped SRR for Wi-MAX/WLAN and satellite communications

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Designing of band-notched UWB antenna and analysis with C-Shaped SRR for Wi-MAX/WLAN and satellite communications(Conference Paper)(Open Access)

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View additional affiliations

Abstract

A Compact form of ultra-wideband antenna with C-Shaped Split ring resonator is proposed, it has a band-notched characteristics. This antenna consists of a rectangular patch with C-shaped split ring nature. The proposed antenna is resonating from 2.8-10GHz with VSWR<2. The Circle fashioned slit is imprinted in the emit patch. The main principle of this work is to achieve higher gain for UBW frequencies range except the stop bands. At 3.6GHz, 5.7GHz and 8GHz frequencies the suggested antenna is approximately exhibits the emission pattern in omnidirectional in the plane of H. In order to get the stable radiation pattern characteristics throughout the entire bandwidth, S11 loss of the respective antenna should be less than-10dB.The suggested antenna is successfully simulated and observed various required specifications such as radiation pattern, S11 loss, gain with the aid of HFSS Software. We promised that the recommended antenna is suitable for Wi-MAX/WLAN and Satellite applications. © 2021 Author(s).

Author keywords

Band-Notched | Gain | Return Loss | UWB | VSWR | Wi-MAX

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2nd International Conference on Advances in Physical Sciences and Materials 2021, ICAPSM 2021; Virtual, Online; India; 12 August 2021 through 13 August 2021; Code 174656

Design and analysis of AC14 ship anchor(Conference Paper)(Open Access)

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Abstract

A Ship's anchor makes a ship to be at a fixed location against currents and winds when ship is in rest position. Purpose of anchor is to restrict the drifting of ship, which is occurs due to the currents. Even though there are many different types of anchor, present paper intended to do design and analysis on stockless anchor AC14 type. Project aims to determine the equivalent von-mises stress and maximum deformation in anchor when subjected to proof test. Proof test load is decided based on the mass of the anchor. (Reference is taken for the relationship of proof test load and mass of the anchor. Solid modeling of Stockless ship anchor model is carried out on NX 11.0 and modal analysis of ship anchor is carried out using ANSYS 16.0. © Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence.

Author keywords

AC14 Anchor | Proof test load | Ship anchor | Stockless anchor | Von-mises stresses

Indexed keywords

Engineering controlled terms: Modal analysis

Engineering uncontrolled terms: 'current | Ac14 anchor | Anchor models | Design and analysis | Proof test | Proof test load | Ship anchor | Solid modelling | Stockless anchor | VonMises stress

Engineering main heading: Ships

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Kandregula, R.; Department of Mechanical Engineering, Vignan's Institute of Information Technology, Andhra Pradesh, Visakhapatnam, India;

Document details - Finite element analysis of porous Ti-6Al-4V alloy structures for biomedical applications

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Finite element analysis of porous Ti-6Al-4V alloy structures for biomedical applications(Conference Paper)(Open Access)

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Abstract

In this article, design and finite element simulation of porous Ti-6Al-4V alloy structures was presented. Typically, titanium and titanium alloy implants can be manufactured with required pore size and porosity volume by using powder bed fusion techniques due to advancement in additive manufacturing technologies. However, the mismatch of elastic modulus between human cortical bone and the dense Ti-6Al-4V alloy implant resulted in stress shielding which accelerate the implant failure. The porous implant structures help in reduce the mismatch of elastic modulus between the cortical bone and implant structure and also improve the bone ingrowth. Hence, the present work focuses on design of Ti-6Al-4V alloy porous structures with various porosities ranging from 10% to 70% and simulated to determine the elastic modulus suitable for human cortical bone. The sample with 45% porosity is found to be best suited for replacement of cortical bone with elastic modulus of 74Gpa, preventing stress shielding effect and enhanced chances of bone ingrowth.

Author keywords

Additive manufacturing | Elastic modulus | Porosity | Ti-6Al-4V alloy

Indexed keywords

Engineering controlled terms: 3D printers | Additives | Elastic moduli | Finite element method | Medical applications | Pore size | Shielding | Ternary alloys | Titanium alloys | Vanadium alloys

Engineering uncontrolled terms: Biomedical applications | Bone ingrowth | Finite element analyse | Finite elements simulation | Human cortical bone | Stress shielding | Ti-6al-4v alloy | Titania | Titanium (alloys)

Engineering main heading: Aluminum alloys

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Document details - Runoff volume prediction in the megadrigadda reservoir catchment due to past land use/land cover trends- A case study

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Runoff volume prediction in the megadrigadda reservoir catchment due to past land use/land cover trends- A case study(Conference Paper)(Open Access)

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Abstract

One major source of water on the Earth is Surface water resources such as Rivers, Rain water sewers, Streams etc. With the rapid change in the mode of usage of land for various purposes like residential, agricultural, industrial, water storage basins, the volume of Surface runoff due to Rain & melting of Snow changes. Estimating such quantities of runoff is essential for proper managing of Water resources over the Earth surface. Runoff estimation of each Mini Water has been done by SCS-CN Curve number method. The required data for this method include Land Use/Land Cover trends of past years, Hydrological Soil Groups, Rainfall trends and AMC Type. Based on the analysis a considerable change in the Groundwater Recharge in the study area is found due to the variations in the Built-up & vegetative cover features ultimately resulting in increasing Surface Runoff there by excess inflow may enter into the Megadrigadda reservoir resulting in Flash floods during monsoons. In the coming years there are chances of the Dam being breached thereby affecting the Visakhapatnam Airport area in its Downstream.

Author keywords

GIS | Groundwater recharge | Land cover | Land use | Runoff | Surface features

Indexed keywords

Engineering controlled terms: Catchments | Digital storage | Geographic information systems | Rain | Recharging (underground waters) | Reservoirs (water) | Runoff

Engineering uncontrolled terms: Case-studies | Ground water recharge | Land cover | Land use/land cover | Reservoir catchments | Runoff volumes | Source of waters | Surface feature | Surface runoffs | Volume predictions

Engineering main heading: Land use

Document details - Comparative study on soil stabilization using industrial by products and coconut coir

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Comparative study on soil stabilization using industrial by products and coconut coir(Conference Paper)(Open Access)

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Abstract

Waste disposal has become a serious concern in developing countries like India. The substitution of these waste materials in the form of stabilizing agents in soil stabilization is a modern approach by which waste materials can be advantageously used. In many instances, the soil has proven to be problematic for the construction of various infrastructures like embankments, pavements, foundations, hydraulic barriers, etc. In the present study, a particular type of soil is stabilized to improve the physical properties by using multiple admixtures. In general, additives such as lime, cement, sawdust, stone dust, and other compounds are used for the stabilization of soil over years. This study is conducted to evaluate the viability of using Coconut Coir Fibre (CC) along with stone dust (SD)/pond ash (PA) as a stabilization material. A comparative analysis on the effect of CC with SD as well CC with PA on engineering characteristics of silty soil is presented in the present study. A sequence of laboratory experiments was conducted on silty soil blended with Coconut Coir Fibre along with proportions of Stone Dust/Pond Ash from 0.5% to 1.5% and 30% as constant respectively by mass of dehydrated soil. The experimental outcomes shown a significant change in properties of soil, which conclude that the coconut coir along with stone dust as a very potential additive to improve the characteristics of silty soil compared to that of pond ash.

Author keywords

CBR | Coconut coir | Industrial waste | MDD | OMC | Pond ash | Soil stabilization | Stone dust | Sustainability

Indexed keywords

Engineering controlled terms: Additives | Developing countries | Dust | Lime | Soil cement | Soil pollution | Stabilization | Waste disposal

Engineering uncontrolled terms: CBr | Coconut coir fibers | Coconut coirs | Comparatives studies | MDD | OMC | Pond ash | Silty soils | Soil stabilization | Stone dusts

Engineering main heading: Soils

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Document details - COVID-19 (SARS-COV2) visual digital data fusion using hybrid technique

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COVID-19 (SARS-COV2) visual digital data fusion using hybrid technique(Conference Paper)

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Abstract

A COVID 19 outbreak caused by the new SARSCoV2 virus was declared by the World Health Organization (WHO) in March 2020. Since then, other studies have used Chest Xray or CT scans to identify this infection. Often, one aspect of the study is that these XRAY or CT scans of Covid patients have to be enhanced. The purpose of picture fusion is to merge complimentary, multi-sensor and/or multi-view images. Our major purpose of our work is to assist doctors speed up treatments in order to give their patients the most effective remedies as soon as possible. This study employs two multi-view data sets, which are merged using hybrid methodology and divided into two phases, as input images for our system. In first stage we use two fusion rules of Dual tree Complex Wavelet Transform (DT-CWT) and Discrete Cosine Transform (DCT) separately on both the images. In second stage we use fusion rule based on Singular Value Decomposition (SVD) on those fused images acquired from first stage. The performance of fused image is carried out by standard deviation (SD), root mean square (RMSE), peak signal to noise ratio (PSNR), percentage fit error (PEF), mean absolute error (MAE), mutual information (MI), quality index (QI) and measure of structural similarity (SSIM). © 2021 Author(s).

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Satyanarayana Murty, P.; Department of Electronics and Communication Engineering, Vignan's Institute of Information Technology, Visakhapatnam, Duvvada, India;

Document details - An efficient radix trie-based semantic visual indexing model for large-scale image retrieval in cloud environment

Software - Practice and Experience

Volume 51, Issue 3, March 2021, Pages 489-502

An efficient radix trie-based semantic visual indexing model for large-scale image retrieval in cloud environment(Conference Paper)

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View additional affiliations

Abstract

In recent years, massive growth in the number of images on the web has raised the requirement of developing an effective indexing model to search digital images from a large-scale database. Though cloud service offers effective indexing of compressed images, it remains a major issue due to the semantic gap between the user query and diverse semantics of large-scale database. This article presents a radix trie indexing (RTI) model based on semantic visual indexing for retrieving the images from cloud platforms. Initially, an interactive optimization model is applied to identify the joint semantic and visual descriptor space. Next, an RTI model is applied to integrate the semantic visual joint space model for finding an effective solution for searching large-scale sized dataset. Finally, a Spark distributed model is applied for deploying the online image retrieval service. The performance of the proposed method is validated on two standard dataset, namely, Holidays 1 M and Oxford 5 K in terms of mean average precision (mAP) and processing time under varying dataset sizes. During experimentation, the presented RTI model shows the maximum mAP value of 0.83 under the dataset size of 1000. Similarly, under the sample count of 1000, it is noted that the standalone server requires a maximum of 118 minutes to complete the process, whereas the spark cluster requires a minimum of around only 19 minutes to finish the process. The experimental outcome showed improvement in terms of various measures over the best rivals in the literature. © 2020 John Wiley & Sons, Ltd.

Author keywords

cloud computing | indexing | large-scale image retrieval | platform as a service | radix trie | semantic data

Indexed keywords

Engineering controlled terms: Indexing (of information) | Large dataset | Query processing | Semantics

Engineering uncontrolled terms: Cloud environments | Compressed images | Distributed modeling | Effective solution | Indexing models | Interactive optimization | Large-scale database | Processing time

Engineering main heading: Image retrieval

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Document details - Analysis and charge control of lithium ion battery with application for off-grid PV system

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2nd International Conference on Smart and Intelligent Learning for Information Optimization, CONSILIO 2020; Goa; India; 24 October 2020 through 25 October 2020; Code 166826

Analysis and charge control of lithium ion battery with application for off-grid PV system(Conference Paper)(Open Access)

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Abstract

For the implementation of the PV micro grid, initially we designed the PV module. Once the PV module is designed we then decided to use P&O technique as an MPPT technique. The output pulse of the MPPT technique is then fed to the boost converter as gate pulse. The output of PV with dc to dc converter is then fed to DC grid from where the 3-phase Inverter with LC filter which converts the DC to 3-phase AC system and then is fed to load. Also the battery system with bidirectional controller is followed by a charge controller is also connected to DC micro grid so that the battery can charge or discharge as per the application. © 2021 Institute of Physics Publishing. All rights reserved.

Indexed keywords

Engineering controlled terms: DC-DC converters | Microgrids | Photovoltaic cells

Engineering uncontrolled terms: Battery systems | BOOST converter | Charge control | Charge controllers | Dc micro-grid | DC-to-DC converters | Output pulse | PV modules

Engineering main heading: Lithium-ion batteries

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Vibration behavior of graphite powder in carbon/basalt reinforced epoxy composites

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ABSTRACT

Polymer framework composites merit a significant job inside the new age designing materials due to their one of kind properties like formability, temperature process, and cost-effective nature. The principle aim of this proposed work is to examine the vibration conduct of graphite powder-filled carbon/basalt cross breed composites produced by a hand lay-up process. Results gathered from the tests uncover that the consideration of 1, 2 promotion 3 wt% of graphite powder significantly impacts the vibration properties of carbon/basalt/epoxy composite.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

In order to have better performance and long life of hybrid composites, the basic requirements are high strength to weight ratio, high resistance to failure in dynamic condition. In this context, it is expedient to study the free vibration response of composites under various stresses and allied condition of temperature, support, lamination scheme and material characteristics. The selection of composites needs to be done on the basis of better strength without significant increase in weight.

By hybridization of fiber involving two or more types in a common matrix for creating new composites, improvement of properties can be achieved in comparison with cases of simple fiber. To optimize the design of such hybrid composites. The effect of stacking sequence, weight percentage, side to thickness ratio, aspect ratio, rotation of fiber and suitability of boundary condition need to be analyzed.

2. Related works

Numerical methods for frequency response of circular sector and sector plates with different materials and laminated composite cases were proposed by eivalen et al. [1]. Harmonic differential Quadrate (HDR) and discrete singular convolution (DSC) give governing equation for nodes. Power loss and force parameters power loss in case of volume fraction have been need for composites.

Free vibration of cracked laminated composite beam having rectangular cross section has been investigated by Kim et al. [2] for arbitrary boundary condition. Jacobi polynomials to generalize choice of permissible displacement function. Moreover, Rayleigh Ritz approach is used obtain formulae using first order shear deformation. Kinematic and physical compatibility have been realized by boundary spring technique. Continuous condition at the cracked sector has been studied by inverse of the compliance flexibility coefficients of fracture mechanics.

Smoothed finite element technique has been used by Amit [3] for analysis of shear deformable straight sided quadrilateral plates. The stiffness matrices of membrane and bending for background quadrilateral cells have been evaluated utilizing edge based smoothing finite method [ES-FEM]. Using smoothed shear strain approach, shear stiffness matrix is calculated so that the performance is compared with edge consistent H-node finite element.

Haieho et al. [4] have analyzed vibration characteristics of composite laminated spherical and cylindrical shells with complex boundary condition. FSDT and multi segment partition approach strategy have been utilized for establishing analytical modeling. Jacobi polynomials have been used in axial direction and Fourier series in circumference direction for determining of admissible dis-

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Document details - Strength and behaviour of roller compacted concrete using crushed dust

Materials Today: Proceedings

2021

Strength and behaviour of roller compacted concrete using crushed dust

(Article in press ?)

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Abstract

Roller compacted concrete is one of the recently developed materials in pavement construction. It is the concrete with zero-slump, highly compacted concrete which is a reliable, economical and durable material for low speed and heavy-duty pavements. The present study highlights identification of materials for roller compacted concrete. It intends to analyse the use of Roller Compacted Concrete Pavement (RCCP) as an alternative of traditional Bituminous Concrete pavements that suffer from rutting and cracking due to heavy loading and hot weather conditions. The study is done using zone II crusher dust, crushed stone and 43 grade cement as constituent materials of Roller Compacted Concrete (RCC). The mechanical strength characteristics of various mixes of roller compacted concrete (RCC) using zone II crusher dust is presented in this work. In this study various mixes were prepared using materials (cement, crusher dust, aggregate). The mixes were proportioned using soil-compaction tests. The Maximum Dry Density (MDD) and Optimum Moisture Content (OMC) of the mixes were determined using Modified Proctor's Test. Mechanical properties of the mixes have been obtained and the effect of cement content and water/cement (W/C) ratio on mechanical properties has been studied. From the results it is observed that there is a remarkable increase in the compressive strength as well as split tensile strength of roller compacted concrete on increase of cement content. The study concludes that the roller compacted concrete can be used for both base and surface course as well as in other geotechnical applications. © 2021

Author keywords

Bituminous Concrete pavements | Compressive strength | Geotechnical applications | Maximum Dry Density | Optimum Moisture Content | Roller Compacted Concrete Pavement | Split tensile strength

Indexed keywords

Engineering controlled terms: Concrete pavements | Dust | Moisture | Moisture determination | Roller compacted concrete | Rollers (machine components) | Soil testing | Tensile strength

Engineering uncontrolled terms: Bituminoi concrete pavement | Cement content | Crusher dust | Geotechnical application | Maximum dry density | Optimum moisture content | Pavement construction | Roller compacted concrete pavements | Roller compacted concretes | Split tensile strengths

Engineering main heading: Compressive strength

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Document details - A Comparative Analysis of Machine Learning Algorithms in Stock Prediction

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2021, Pages 2619-2623

4th European International Conference on Industrial Engineering and Operations Management, IEOM 2021; Virtual, Online; ; 2 August 2021 through 5 August 2021; Code 273059

A Comparative Analysis of Machine Learning Algorithms in Stock Prediction(Conference Paper)

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Abstract

In order to earn more money in less time in this pandemic period, the ultimate option is to invest some amount in the stock market. If we invest more then we will have more profit whenever we invest in a good company. In Stock exchange, the goal is to understand the future worth of the economic stock. The recent trend in stock market prediction innovations is making use of machine learning that makes forecasts based up on the worth's of present stock exchange indices by training on their previous values. Our work analyzes machine learning algorithms and also say the best algorithms for predicting stock values. Also comparing results of four algorithms namely Linear Regression, LSTM, k –nearest neighbors, fb-prophet algorithms. Factors considered are open, close, high, date and last. Furthermore, the proposed work examines the use of the prediction system in real-world settings and also problems related to the precision of the overall worth are given, also provides a machine-learning model to forecast the long life of stock in a open market. The effective forecast of the stock will certainly be a excellent possession for stock exchange organizations as well as will certainly provide real-life solutions stock capitalists encounter. © IEOM Society International.

Author keywords

KNN Liner regression LSTM Stock Market forecast

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Document details - Diabetes Diagnosis and Classification Using Feed Forward Neural Network Algorithm

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Diabetes Diagnosis and Classification Using Feed Forward Neural Network Algorithm(Conference Paper)

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Abstract

Diabetes mellitus (DM) is a persistent sickness that may cause numerous difficulties. Machine learning methods are used to analyze and classification of diabetes. The learning-based calculations play an important role in supporting dynamic in infection conclusion and expectation. In this work, conventional categorization algorithms and artificial neural networks are researched for the diabetes dataset. Likewise, different execution strategies with various angles are assessed for the Naive Bayes, K-nearest neighbour, decision trees, Extremely Randomized tree, radial basis function and multi-layer perceptron (MLP) algorithms. It upholds the patient's assessment that conceivably experiences the ill effects of diabetes later on. This paper gave that the feed-forward neural network algorithm multi-layer perceptron algorithm gives the most noteworthy expectation precision with the least Mean square error rate of 0.15. The multi-layer perceptron (MLP) gives the most reduced bogus negative rate and bogus positive rate with the most elevated region under the curve of 0.88. © IEOM Society International.

Author keywords

Classification of diabetes | Diabetes prediction | Machine learning algorithm | MLP | Neural network

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Document details - Smart Actuators: A Review

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Smart Actuators: A Review(Conference Paper)

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Abstract

Robotic systems are a combination of actuators and control systems for manipulating a tool or end effector along a specified path. Different types of actuators exist for different applications like bio mimicking, rehabilitation and prosthesis, and are classified based on their principle of actuation. These actuators include Serial Elastic Actuators, Shape Memory Alloys (SMA), Dielectric Elastomer Actuator (DEA), fluidic actuation etc. Various robotic systems have been developed with different actuators. SEA are conventional electric actuators are coupled with flexible elements. The main purpose is the introduction of compliance. Smart materials like SMA, Soft actuators like DEA and Flexible Elastomer Actuators using Fluidic actuation principles, pertaining to their actuation principles, can be used for biomimicking applications and their compliance nature due to their flexibility results in better shock absorbing and energy recovery capabilities. This paper presents a comprehensive literature survey relating to various actuators and their applications. A brief review of use of EMG and EEG as control systems is also presented in this article. Mathematical formulations have also been summarized in this article. © IEOM Society International.

Author keywords

Dielectric Elastomer Actuator | Serial Elastic Actuators | Shape Memory Alloy | Soft Actuators

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Document details - SYMMETRICAL HIGH ISOLATED SLOT-COUPLED EIGHT-ELEMENT MULTIPLE-INPUT-MULTIPLE-OUTPUT BOWTIE DIELECTRIC RESONATOR ANTENNA FOR 5.2 GHz WLAN APPLICATIONS

Telecommunications and Radio Engineering (English translation of Elektrosvyaz and Radiotekhnika)

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SYMMETRICAL HIGH ISOLATED SLOT-COUPLED EIGHT-ELEMENT MULTIPLE-INPUT-MULTIPLE-OUTPUT BOWTIE DIELECTRIC RESONATOR ANTENNA FOR 5.2 GHz WLAN APPLICATIONS(Article)

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Abstract

This paper discusses a small and low-cost eight-element multiple-input-multiple-output (MIMO) bowtie dielectric resonator antenna designed for WLAN (5.2 GHz) applications. The fractional impedance bandwidth (4.77–5.44 GHz) for all ports are 13.12% and enhance the gain for targeted frequency range. The isolation between ports improved by etching two bubbled I-shaped inserts within the rectangular box defected ground structure. The isolation between ports exceeds –25 dB over the operating band. Diversity performance parameters of MIMO antenna are calculated, and they lie within their optimum values. A prototype of all radiators are fabricated and tested experimentally to authenticate the simulated results.

Author keywords

Bowtie dielectric resonator antenna (BDRA) | Bubbled I-shape | Diversity performance | Multiple-input-multiple-output (MIMO) | WLAN

Indexed keywords

Engineering controlled terms: Codes (symbols) | Defected ground structures | Dielectric resonators | Electric impedance | Etching | Feedback control | Microwave antennas | Microwave filters | Slot antennas | Telecommunication repeaters | Wireless local area networks (WLAN)

Engineering uncontrolled terms: Bow tie | Bowtie dielectric resonator antenna | Bubbled I-shape | Dielectric-resonator antennas | Diversity performance | Fractional impedances | Frequency ranges | Impedance bandwidths | Low-costs | Multiple-input-multiple-output

Engineering main heading: MIMO systems

Document details - Study on forming and fracture behavior of continuous Annealed, batch annealed and cold rolled SS 430 sheet metals

Materials Today: Proceedings

Volume 46, 2021, Pages 51-60

2nd International Conference on Manufacturing Material Science and Engineering, ICMMSE 2020; Hyderabad; India; 7 August 2020 through 8 August 2020; Code 169597

Study on forming and fracture behavior of continuous Annealed, batch annealed and cold rolled SS 430 sheet metals(Conference Paper)

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Abstract

The stainless steel 430 grade sheet metals with three process conditions namely, continuous annealed (CA), batch annealed (BA) and cold rolled (CR) were subjected to forming limit diagram (FLD) experiment. The combined FLD and the fracture limit diagram were plotted for all three processed conditions, which resulted in higher forming limit strain and fracture limit strain values for the CA sheet metal. Further, the parameters like, strain hardening exponent (n), normal anisotropy (r) and formability parameter (nr) reported higher values for CA sheet metal, which signified better formability. Besides, the void coalescence analysis was performed after FLD experiment. Based on void coalescence analysis, the CA sheet metal exhibited higher average void size, void area with least ligament thickness and d-factor indicated its better formability before fracture. These results were consistent with the experimentally evaluated FLD, which showed higher formability for CA sheet metal. Also, the presence of recrystallized microstructure in CA sheet metal resulted in higher strain hardening capability, which resulted higher necking percentage in combined FLD and fracture limit diagram.

Author keywords

Formability | Forming and fracture limit diagram | Mechanical properties | SS 430 | Void coalescence

Indexed keywords

Engineering controlled terms: Annealing | Coalescence | Cold rolling | Fracture | Fracture mechanics | Metal cladding | Metals | Steel sheet | Strain hardening

Engineering uncontrolled terms: Cold-rolled | Condition | Forming behavior | Forming limit diagrams | Forming limit strains | Fracture behavior | Fracture limit diagrams | Process condition | SS 430 | Void coalescence

Engineering main heading: Formability

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Document details - A Comparative Study on Construction of 3D Objects from 2D Images

Lecture Notes in Networks and Systems

Volume 210 LNNS, 2021, Pages 205-222

4th International Conference on Smart Technologies in Data Science and Communication, SMART-DSC 2021; Guntur; India; 18 February 2021 through 19 February 2021; Code 260939

A Comparative Study on Construction of 3D Objects from 2D Images(Conference Paper)

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Abstract

The 3D image construction for the 2D images is a longstanding problem, explored by the number of computer graphics, computer vision, and machine learning research organizations from decades. After the evolution of deep learning architectures, scholars have shown their interest in developing 3D images from the 2D greyscale or RGB images because this perspective shows a significant influence in the discipline of computer vision. The applications of this conversion found in various fields of medical image analysis, robotic vision, game design, lunar explorations, 3D modelling, military, geographical structuring, physics, support models, etc. Potentially, when a 2D image converted to 3D representation, the same image can be viewed from different angles and directions. The 3D structure, which in turn generated, is much more informative than 2D images as it contains information about distance from the camera to a particular object. In this paper, we discussed various exiting methods for generating 3D representations from 2D images, using 3D representational data as well as without 3D representational data and proposing a novel approach for the construction of 3D models from existing 2D images using GAN. Generative adversarial networks (GANs) have shown tremendous results in generating new fake data from existing data, where we cannot detect the false data. Various other architectures of GAN, like HOLO-GAN, IG-GAN, have also been proposed to meet the need to convert 2D to 3D representation, which produced excellent results. After analysing, we provide an extensive comparative review on methods and architectures, which can convert 2D images to 3D objects and express our thoughts on the ideas proposed. Further, the concept of GAN extended to represent 360 view images, panorama images in 3D structures, which plays a vital role in spherical view analysis and synthesis, virtual reality design, augmented reality design, 3D modelling of data, etc.

Author keywords

2D images | 3D images | Deep learning | Generative adversarial network (GAN)

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Document details - Artificial Intelligence-Based Vehicle Recognition Model to Control the Congestion Using Smart Traffic Signals

Lecture Notes in Networks and Systems

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4th International Conference on Smart Technologies in Data Science and Communication, SMART-DSC 2021; Guntur; India; 18 February 2021 through 19 February 2021; Code 260939

Artificial Intelligence-Based Vehicle Recognition Model to Control the Congestion Using Smart Traffic Signals(Conference Paper)

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Abstract

The present traffic system is a timer-based system which works upon a constant timing. If one side of a traffic junction is having fewer vehicles compared to the other side, still the timer runs the same for both the sides. In our paper, we overcome this problem by using a vehicle recognition model. This AI model runs over the images of all the sides of a traffic junction and recognizes the number of vehicles and the type of vehicles. Depending upon the count and type of vehicles, the timer is reset every time, and the time for every run is calculated by the model. In addition to this, our vehicle recognition (AI) model also focuses on detection of ambulances, so the side with these kinds of vehicles is given first priority over the other sides. This model detects individual vehicles and categorizes them into one of these classes instead of counting vehicles. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

AI model | Ambulance | Traffic system | Vehicle recognition

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SciVal Topic Prominence

Topic:

Prominence percentile:

Document details - An IoT Model-Based Traffic Lights Controlling System

Lecture Notes in Networks and Systems

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4th International Conference on Smart Technologies in Data Science and Communication, SMART-DSC 2021; Guntur; India; 18 February 2021 through 19 February 2021; Code 260939

An IoT Model-Based Traffic Lights Controlling System(Conference Paper)

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Abstract

Several problems of pandemic situations arise in various countries and also around the world in recent years. In recent days, the situation of traffic was going very great in number due to these pandemics. Most of these pandemics are occurring due to the viral spread with the contacts or nearby people. As a result, most of the people are interested to purchase their own vehicles that may be either two-wheeler vehicles or any four-wheeler vehicles. As a result, the traffic problems in the cities are growing at a faster level, and also, the pollution levels are getting increased. Hence, in the current article, an attempt had been made to analyse the traffic on the roads to control the congestions on the city roads at regular intervals of time. The current model was developed on the Python platform, for understanding the performance of the current model, four different cases of input images were selected and tested with the current developed model, and the results were discussed in the results section. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Four wheeler | IoT model | Lights | Pandemic situations | Raspberry Pi | Traffic | Traffic vehicles | Two wheeler | Usage of vehicles

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SciVal Topic Prominence

Topic:

Prominence percentile:

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Document details - Performance Analysis of a Simulation-Based Communication Network Model with NS2 Simulator

Lecture Notes in Networks and Systems

Volume 210 LNNS, 2021, Pages 139-146

4th International Conference on Smart Technologies in Data Science and Communication, SMART-DSC 2021; Guntur; India; 18 February 2021 through 19 February 2021; Code 260939

Performance Analysis of a Simulation-Based Communication Network Model with NS2 Simulator(Conference Paper)

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Abstract

This paper displays a system show for cutting edge cell systems intended to meet the dangerous needs of versatile information while limiting vitality utilisation. The store technique is used in the remote edge of the spread of prominent substance documents, along these lines lessening the substance and the separation between the requestor. Keeping in mind the end goal to improve utilisation of the accessible store space, the reserve system is upgraded and multicast transmission is considered. The numerical after-effects of the following drive demonstrate that mix of reserve and multicast is compelling when there is happening rehashed asked for a couple of substance records show up over the long haul. It can in reality diminish vitality costs within the sight of an extensive interest for postponed resilience content. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

5G networks | Caching | Communication networks | Multicast | Routing

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SciVal Topic Prominence

Topic:

Prominence percentile:

Document details - A Steady-State Analysis of a Forked Communication Network Model

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4th International Conference on Smart Technologies in Data Science and Communication, SMART-DSC 2021; Guntur; India; 18 February 2021 through 19 February 2021; Code 260939

A Steady-State Analysis of a Forked Communication Network Model(Conference Paper)

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View additional affiliations

Abstract

Communication between the people around the world is increasing a lot. As a result, several types of network models are being designed to meet the requirements of the users for data transmission with respect to both voice and video communication. There is always a scope for the development of new network models for better and faster communication. As a result, the number of researchers is getting interested toward the utilization of these sensor networks and also working with the wireless sensor devices. In the current article, an attempt has been made to develop a forked communication network model with queuing model-based equations are developed for better understanding of the model to implement and verify its performance at various situations. The results are calculated by the help of MATLAB and MathCAD software. The results can be observed in detail in the results section for a better understanding of the working of the network model. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Communication networks | Delay | Forked model | Probability generating function (PGF) | Throughput | Uniform batch size | Utilization

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SciVal Topic Prominence

Topic:

Document details - Automatic Determination of Harassment in Social Network Using Machine Learning

Lecture Notes in Networks and Systems

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Automatic Determination of Harassment in Social Network Using Machine Learning(Conference Paper)

Doppala, B.P., NagaMallik Raj, S., Stephen Neal Joshua, E., Thirupathi Rao, N.

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Abstract

Globally the number of Internet users are very high, and the majority of the users are youngsters. They will be participating in many activities in social networks like twitter, Facebook, etc. With lightning speed of Internet, everyone can explore the information of unknown. As a result, much more cyber-based crimes and harassments are raising day by day. Artificial intelligence can bring out solution for such issues. Lot of research has been taken place for the identification of online harassments through comments and messages posted over the platforms. Sometimes context of the statement matters for judging the comment. We propose a mechanism for identifying online harassment based on context by using one of the familiar online platform called Twitter. For this research work, we have used few machine learning algorithms. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Cyber bullying | Cyber harassment | Cyber stalking | Machine learning | Social networking

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Doppala, B.P.; Vignan's Institute of Information Technology (A), Visakhapatnam, India;

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Topic:

Prominence percentile:

Document details - An Automatic Perception of Blood Sucker on Thin Blood Splotch Using Graphical Modeling Methods

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An Automatic Perception of Blood Sucker on Thin Blood Splotch Using Graphical Modeling Methods(Conference Paper)

Sushma, D., Satyanarayana, K.V., Thirupathi Rao, N., Bhattacharyya, D., Kim, T.-H.

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Abstract

Parasite is a host bacterium known as a plasmodium which lives on a different organism. This parasite is susceptible to malaria, dengue, typhoid, etc. The involvement of parasite in the blood cells will also lead to death of the humans. It is also very important to identify and diagnose the parasite in early blood film images in order to save human life. Therefore, the key slogan of this paper is to identify in less time the parasite in red blood cells using a new image processing technique by blood film images in early phases. Aim: In this article, the primary focus is on identifying the blood sucker which occur in red blood cells using thin blood film images in less time using a modern image processing system, in early stage. Method: In several steps, the procedure used detects the presence of blood sucker on photographs of blood films. The first step is to obtain the image from an optical microscope laboratory. Using the standard method, the image is then transferred into the grayscale image. The output image which is a grayscale image is transformed into the single-color image i.e., monochrome image which contains the pixel values using the "Binary Threshold method". This monochrome image is then transformed into a matrix format and printed with binary values i.e., zero's and one's. Conclusion: The output matrix method will be displayed with the binary values by either one or zero which represents the presence or absence of blood sucker. If all zeroes are displayed in whole image, then no blood sucker presence can be reached in that case, and if any ones are displayed in the blood film images, it may be found that the blood film images contain a blood sucker. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Blood film images | Blood sucker | Image processing

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Document details - A Study on Techniques of Soft Computing for Handling Traditional Failure in Banks

Lecture Notes in Networks and Systems

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A Study on Techniques of Soft Computing for Handling Traditional Failure in Banks(Conference Paper)

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[b]Department of Computer Science and Systems Engineering, College of Engineering (A), Andhra University, Visakhapatnam, 530003, India

Abstract

Financial turmoil (crisis) is a condition that arises due sudden decline in the nominal value of the financial assets which results in banking panics. Predicting alarming signals of crisis which is financial in nature is a tough assignment as the total economy is based on it for all industries in general and banks in particular. During the panic situation, there is coincides with the recession. The present conceptual paper gives a review of soft computing applications for predicting the crisis condition or bankruptcy which further help in promoting future empirical research to prevent bank failures and financial crises. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Banking failures | Early warning signals | Financial assets | Financial crises | Panic situations | Soft computing techniques

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SciVal Topic Prominence

Topic:

Prominence percentile:

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Document details - Reversible Data Hiding Using Secure Image Transformation Technique

Lecture Notes in Networks and Systems

Volume 204 LNNS, 2021, Pages 657-668

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Reversible Data Hiding Using Secure Image Transformation Technique(Conference Paper)

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Abstract

With the gigantic popularity of re-appropriating data in the path of the cloud, it's essential towards the protection of data and authorizes the cloud employee to easily change the knowledge at the same time. Underneath such requests, Reversible Data Hiding in Encrypted Images (RDH-EI) attracts associate with an ever-increasing variety of specialists' decisions concerning the structure for RDH-EI upheld Reversible Image Transformation (RIT). Two RDH methods, together with customary RDH conspire and unified putting in and scrambling arrangement, data received to insert watermark within the encoded image, which can fulfill numerous wants on image quality and big implanting limit individually. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Reversible data hiding (RDH) | Reversible data hiding in encrypted images (RDH-EI) | Reversible image transformation (RIT)

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Budumuru, P.R.; Vishnu Institute of Technology, Bhimavaram, India;

Document details - A Deep Learning-Based Object Detection System for Blind People

Lecture Notes in Networks and Systems

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A Deep Learning-Based Object Detection System for Blind People(Conference Paper)

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Abstract

Visual impairment is one of the top disabilities among men and women across the world of all ages. Object detection is the primary task for them, and it can be implemented by deep learning techniques. Earlier implementation techniques involve in object detection with a strategy of single labeling. The proposed model uses classification techniques which reduce the recognize time of multi-objects with best time complexities and can help the visually impaired people in assisting the accurate navigation, in both indoor and outdoor circumstances. The proposed hybrid model is a combination of U-Net with base as residual network (ResNet) which improves accuracy in detection of objects in indoor and outdoor for visually impaired people. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Deep learning | Object detection | ResNet | U-Net | Visually impaired people

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Beside: VSEZ, Duvvada

Document details - A Detailed Study on Optimal Traffic Flow in Tandem Communication Networks

Lecture Notes in Networks and Systems

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A Detailed Study on Optimal Traffic Flow in Tandem Communication Networks(Conference Paper)

Thirupathi Rao, N., Asish Vardhan, K., Srinivasa Rao, P., Bhattacharyya, D., Kim, H.-J.

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Abstract

The utilization of communication networks is increasing in a rapid manner day to day. As the network models are growing a lot, the people using those networks are also increasing a lot. As the number of users is increasing, the provision of Internet and other network facilities also had to be increased. The increase of facilities will cost a lot, as the cost of this network equipment will be more. Hence, before going for the actual installation and utilization of these facilities, the models are based on the real-time situation scenarios and those network models are studied in detail for the better understanding and for better proper utilization and installation of the network facilities. Several models had been developed in the literature for various scenarios. In the current model, a particular situation of the network model was taken by choosing that the model was in forked model condition. Forked model condition means the two nodes are connected in parallel to each other, and the other third node was connected in series with the other two-node parallel combination. The flow of the network will first cross the two nodes which were connected in parallel to each other and then the flow will be carried to the third node in serial communication. The distribution to be considered here for the data flow was the Poisson process with binomial bulk arrivals. In that scenario, the performance of the network model is calculated, and the sensitivity of the model also calculated. The results are discussed in detail in the results section. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Bulk arrivals | Communication networks | DBA | Forked model | Optimal analysis | Parallel nodes | Serial node | Throughput of the node

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Document details - Collective Examinations of Documents on COVID-19 Peril Factors Through NLP

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International Conference on Communication, Computing and Electronics Systems, ICCCES 2020; Coimbatore; India; 21 October 2020 through 22 October 2020; Code 257029

Collective Examinations of Documents on COVID-19 Peril Factors Through NLP(Conference Paper)

Laxmi Lydia, E., Moses Gummadi, J., Ranjan Pattanaik, C., Prasad, B., Usha Kumari, C., Daniel, R.

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View additional affiliations

Abstract

The outbreak of the novel COVID-19 virus is identified across all experimental scientific tests that assist victims to fight against the pandemic situation. The problem seems to have a large number of scientific COVID-19 articles with different risk factors. The quick identification of documents allows the processing and interpretation of inevitable essential knowledge for investigators. This article provides a solution by creating an unsupervised framework for the interpretation of clinical trials over COVID-19 risk factors with a diverse range of articles related to vaccines and treatments from a large corpus of documents. It also provides practical informative knowledge regarding COVID-19 risk factors and helps researchers to enable any single author to obtain appropriate information. The present application uses artificial intelligence, natural language processing approaches, incorporated throughout the search engines, to search for keywords to classify categories with normalized linguistic data. The text data are instead parsed in phrases and thresholds the text with recognition of data frame components with relevant outcomes. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Artificial intelligence (AI) | COVID-19 | Cytotoxic chemotherapy | MERS-CoV | Natural language processing (NLP) | SARS-CoV-2

Indexed keywords

Engineering controlled terms: Artificial intelligence | Character recognition | Natural language processing systems | Viruses

Engineering uncontrolled terms: Clinical trial | Data frames | Different risk factors | Diverse range | Large corpora | Linguistic data | NAtural language processing | Risk factors

Engineering main heading: Search engines

Document details - Interdependence in Artificial Intelligence to Empower Worldwide COVID-19 Sensitivity

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Interdependence in Artificial Intelligence to Empower Worldwide COVID-19 Sensitivity(Conference Paper)

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Abstract

Researchers from different disciplines are striving to leverage a solution for COVID-19 with a unique commitment of scientific collaborations and with cognitive technologies, and highly flexible learning processes are required to maintain the transmission of knowledge, prototype, and code by integrating the application areas to a specific culture and cross-border cooperation. The research experts in the artificial intelligence (AI) and machine learning (ML) domain were tracked and predicted with real-time data observed throughout the world regarding the pandemic situation and timely assessment of the distributed COVID-19 patient information. The considered physiological features followed by clinical tests of patients with COVID-19 offer very simple access to subsequent data transformation, which was relevant but complicated. This paper works on in-depth exploratory data analysis (EDA) prediction analysis over the global medical database of COVID-19 will be available for benefiting future artificial predictive, analytical, and biomedical research, which includes additional COVID-19 approaches associated with pandemics.

Author keywords

Artificial intelligence (AI) and machine learning (ML) | COVID-19 | Exploratory data analysis (EDA) | SARA-CoV-2

Indexed keywords

Engineering controlled terms: Knowledge management | Medical computing | Metadata

Engineering uncontrolled terms: Biomedical research | Data transformation | Exploratory data analysis | Flexible Learning | Medical database | Patient information | Physiological features | Scientific collaboration

Engineering main heading: Artificial intelligence

Document details - Implementation of online and offline product selection system using FCNN deep learning: Product analysis

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2019 International Conference on Advances in Materials Research, ICAMR 2019; Sathy; India; 6 December 2019 through 7 December 2019; Code 169281

Implementation of online and offline product selection system using FCNN deep learning: Product analysis(Conference Paper)

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Abstract

Now a day's Artificial intelligence and deep learning techniques recommended critical E-commerce applications. The human computing, computer aided designs cannot understand the alternative offline and online products. Therefore, customers are critical to find out the products such as groceries, fashion and health. However, it is a major task to overcome this limitation for human perceptions. In this research work an advanced FCNN deep learning model is proposed with global thresholding technique. For this work selecting the digital images and online images for pre-processing and classification. At primary stage segmentation is applied then classification is performed through FCNN, at final calculating the performance measures such as accuracy 98.7%, sensitivity 98.7% and throughput 99.23% has been achieved and outcomes are challenging the present technology. © 2021 Elsevier Ltd.

Author keywords

Accuracy | Convolution neural network | Deep learning | FCNN | Product analysis | Product detection | Product selection

Indexed keywords

Engineering controlled terms: Computer aided instruction | Deep learning | E-learning | Learning systems

Engineering uncontrolled terms: Accuracy | Convolution neural network | Deep learning | FCNN | Off-line products | Online products | Product analysis | Product detection | Product selection | Selection systems

Engineering main heading: Computer aided design

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Global Integration and Distribution of Data Through Machine Learning for COVID-19(Conference Paper)

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Abstract

COVID-19 is referred to as a broad disaster struck out in the society as a challenge. The large quantity of statistical information requires machine tools to improve the knowledge and accelerate COVID-19 forecast, analysis, and its corresponding remedial measures. But, to evade global hazards in these applications, open research will be made mandatory. This article uses machine learning model to integrate COVID-19 data and distribute the data globally. Machine Learning (ML) solutions that rely on COVID-19 data use the SIR model and logistic regression model to analyze how the pandemic cycle propagates all around the inhabitants. The figures of the SIR model concentrate on time-driven case scenarios to predict the behavior of infection, whereas the cumulative cases have become more reliant on significant-data plots. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

COVID-19 | Logistic Regression (LR) | Machine Learning (ML) | SIR model

Indexed keywords

Engineering controlled terms: Logistic regression | Machine tools

Engineering uncontrolled terms: Global integration | Logistic Regression modeling | Machine learning models | Remedial measures | SIR model | Statistical information

Engineering main heading: Machine learning

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Document Type: Conference Paper

Document details - Design of automated identification of alcoholic drivers in intoxicated state

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Design of automated identification of alcoholic drivers in intoxicated state(Conference Paper)

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Abstract

High-speed vehicles and reckless driving have caused quite frequent accidents by intoxicated people. Alcoholism is one of the key causes contributing to reckless driving. We used an alcohol sensor in this work to detect the driver's condition and take the appropriate action. Because the flow of information is very critical in case of incidents, the device also integrates on board pressure and MEMS sensor to identify the effects. The camera takes the pictures, and the GPS location information is sent to registered mail via the Raspberry pi3 board's TWILIO app mounted in the car, sending the alert to the registered mobile phone. In addition, FMCW radar is used for anti-collision purposes because of its precise measurements of short range. © 2021 Elsevier Ltd.

Author keywords

FMCW radar | Individual images | Raspberry pi3 | RFID detection | Server | TWILIO

Indexed keywords

Engineering controlled terms: Accidents | Collision avoidance | Continuous wave radar | Frequency modulation | Radar imaging | Radar measurement

Engineering uncontrolled terms: Alcohol sensor | Automated identification | Condition | FMCW radar | High speed vehicles | Individual image | Raspberry pi3 | Reckless driving | RFID detection | TWILIO

Engineering main heading: Radio frequency identification (RFID)

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Original language: English

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Publisher: Elsevier Ltd

Document details - Comparative Analysis of Prevalent Disease by Preprocessing Techniques Using Big Data and Machine Learning: An Extensive Review

Advances in Intelligent Systems and Computing

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International Conference on Machine Intelligence and Soft Computing, ICMISC 2020; Guntur; India; 3 September 2020 through 4 September 2020; Code 254739

Comparative Analysis of Prevalent Disease by Preprocessing Techniques Using Big Data and Machine Learning: An Extensive Review(Conference Paper)

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Abstract

Nowadays, in communities like healthcare and biomedical data, there has been a tremendous growth. The healthcare industry maintains a vast quantity of treatments that should be given to patients by analyzing the diseases that once has already occurred among patients, for further references and methodologies in curing the diseases by maintaining this vast track of history that has already been saved in the healthcare industry. In view of big data progress in biomedical data and healthcare communities, veracious study and predictive analysis of this methodologies related to medical data account to early disease recognition, patient care, and community services. When the trait of these methodologies is incomplete, the promptitude of study becomes economized. Furthermore, at particular regions, they show an uncommon trait of these certain differential regional diseases, which may cause the outcomes in diminishing the prediction of disease outbreaks. A prior task is that how the data can be accessed and how the information could be available for particular disease from these vast data saving machines. On the other hand, some machines develop techniques that are applied by providing realistic time sequence data, statistical analysis, and innovative data analytics in terms of patient's family history, laboratory reports, impact of disease, and blood pressure. The proposed work is to identify the problem in patient earlier by producing the exact treatment in advance before the disease attacks the patient completely, which may save the patients' life in reducing the complexities. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Big data | Health care | Machine learning | Predictive analysis

Indexed keywords

Engineering controlled terms: Big data | Blood pressure | Data Analytics | Machine learning | Patient treatment | Predictive analytics | Soft computing

Engineering uncontrolled terms: Biomedical data | Community services | Comparative analysis | Disease outbreaks | Early disease | Healthcare industry | Preprocessing techniques | Time sequence data

Engineering main heading: Diseases

Document details - Emotion Recognition Through Human Conversation Using Machine Learning Techniques

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Emotion Recognition Through Human Conversation Using Machine Learning Techniques(Conference Paper)

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Abstract

Emotion recognition will perform a hopeful role in the field of artificial intelligence, uniquely in the case of human–machine interface development. It is the process of recognizing and analyzing the emotion of chat and text, i.e., moods of the people can be easily found, and this process can be used in various social networking websites and various business-oriented applications. The mood of the person will be confirmed by making proper observations, i.e., by asking multiple questions until his/her situation is correctly recognized. Based on his/her answers, it tries to refresh his/her mind if he/she is in a bad mood (mild) by providing the refreshments based on the interests of the person that were gathered initially. The proposed system goes about as a choice emotionally supportive network and will demonstrate to be a guide for the doctors with the analysis. The user expresses his or her feelings, and the Chatbot replies accordingly. Using Python packages, NLTK and Flair, we analyze the intensity of the emotion. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

DeepMoji | Emotion recognition | Flair | Naïve Bayes classifier | NLTK vader | TextBlob

Indexed keywords

Engineering controlled terms: Machine learning | Soft computing | Speech recognition

Engineering uncontrolled terms: Business-oriented | Chatbot | Emotion recognition | Machine interfaces | Machine learning techniques

Engineering main heading: Character recognition

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Document details - Comparative Analysis of Prevalent Disease by Preprocessing Techniques Using Big Data and Machine Learning: An Extensive Review

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Comparative Analysis of Prevalent Disease by Preprocessing Techniques Using Big Data and Machine Learning: An Extensive Review(Conference Paper)

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Abstract

Nowadays, in communities like healthcare and biomedical data, there has been a tremendous growth. The healthcare industry maintains a vast quantity of treatments that should be given to patients by analyzing the diseases that once has already occurred among patients, for further references and methodologies in curing the diseases by maintaining this vast track of history that has already been saved in the healthcare industry. In view of big data progress in biomedical data and healthcare communities, veracious study and predictive analysis of this methodologies related to medical data account to early disease recognition, patient care, and community services. When the trait of these methodologies is incomplete, the promptitude of study becomes economized. Furthermore, at particular regions, they show an uncommon trait of these certain differential regional diseases, which may cause the outcomes in diminishing the prediction of disease outbreaks. A prior task is that how the data can be accessed and how the information could be available for particular disease from these vast data saving machines. On the other hand, some machines develop techniques that are applied by providing realistic time sequence data, statistical analysis, and innovative data analytics in terms of patient's family history, laboratory reports, impact of disease, and blood pressure. The proposed work is to identify the problem in patient earlier by producing the exact treatment in advance before the disease attacks the patient completely, which may save the patients' life in reducing the complexities.

Author keywords

Big data | Health care | Machine learning | Predictive analysis

Indexed keywords

Engineering controlled terms: Big data | Blood pressure | Data Analytics | Machine learning | Patient treatment | Predictive analytics | Soft computing

Engineering uncontrolled terms: Biomedical data | Community services | Comparative analysis | Disease outbreaks | Early disease | Healthcare industry | Preprocessing techniques | Time sequence data

Engineering main heading: Diseases

Document details - Secure Information Transmission in Bunch-Based WSN

Advances in Intelligent Systems and Computing

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Secure Information Transmission in Bunch-Based WSN(Conference Paper)

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Abstract

Remote network incorporates a bigger favourable position in the present correspondence application like ecological, movement, military and well-being perception. To understand these applications, it is important to have a solid directing convention. The self-sorting out nature of MANETs makes them appropriate for some applications and henceforth, extensive exertion has been put into anchoring this kind of systems. Secure correspondence in a system is dictated by the unwavering quality of the key administration conspire, which is in charge of creating, circulating and looking after encryption/decoding keys among the hubs. In this paper, different key administration plans for MANETs are talked about. This examination work proposes a novel secure identity-based key management convention making utilization of cryptographic and information theoretic security. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Key administration | MANET | Steering conventions | Symmetric key

Indexed keywords

Engineering controlled terms: Artificial intelligence | Cryptography | Information theory | Mobile ad hoc networks | Soft computing

Engineering uncontrolled terms: Identity-based | Information transmission | Information- theoretic securities | Key management | Remote networks | Self-sorting | Well being

Engineering main heading: Mobile security

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Publisher: Springer Science and Business Media Deutschland GmbH

Document details - A Comparative Study on Automated Detection of Malaria by Using Blood Smear Images

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A Comparative Study on Automated Detection of Malaria by Using Blood Smear Images(Conference Paper)

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Abstract

Malaria is a parasitic disease or mosquito-borne blood disease. When the mosquito bites a human being, that particular parasite is freed into the human being bloodstream and infects the red blood cells which cause the malaria. We need to understand if the blood-related illness is malaria or not before we provide the right therapy. For this purpose, we must diagnose red blood cells by recognizing or counting red blood cells (erythrocytes). It is very difficult to manually count and recognize infected red blood cells while testing under a microscope by pathologists because maybe it leads to different variations. The current paper gives an overview of the comparison of three different papers with three different techniques used to identify that the red blood cells are infected or not with great accuracy and also to identify which methods are giving best result while performing the diagnosis automatically. With different techniques and methods like Otsu threshold method, global threshold method and classifiers like artificial neural network and support vector machines. All these techniques and methods are related to the diagnosis of the malaria automatically which will reduce the time taken for performing the diagnosis and also it improves the consistency and gives the accurate, rapid result in diagnosis. From the above three methods used, an attempt has been made to finalize the best method from the above three methods. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Artificial neural networks | Automation | Blood smear cells | Feature extraction | Global threshold | Malaria | Otsu threshold method | Parasites | Plasmodium malaria | Support vector machines | Water threshold transform

Indexed keywords

Engineering controlled terms: Cells | Cytology | Diagnosis | Diseases | Neural networks | Soft computing | Support vector machines

Engineering uncontrolled terms: Automated detection | Blood smears | Comparative studies | Global threshold | Human being | Red blood cell | Three different techniques | Threshold methods

Engineering main heading: Blood

Document details - Performance Analysis of Different Classification Techniques to Design the Predictive Model for Risk Prediction and Diagnose Diabetes Mellitus at an Early Stage

Advances in Intelligent Systems and Computing

Volume 1280, 2021, Pages 177-184

International Conference on Machine Intelligence and Soft Computing, ICMISC 2020; Guntur; India; 3 September 2020 through 4 September 2020; Code 254739

Performance Analysis of Different Classification Techniques to Design the Predictive Model for Risk Prediction and Diagnose Diabetes Mellitus at an Early Stage(Conference Paper)

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Abstract

Diabetes mellitus is also known as diabetes is the chronic disease. It is basically metabolic disorder. In this type of disease, glucose level is abnormally high in blood and in consequence body unable to produce adequate insulin in order to perform the needs. Glucose is one of the most vital components of health for producing energy of cell and brain. Blood containing excessive amount of glucose can lead to several serious health complications. Designing an innovative prediction model for early recognition of diabetes using machine learning techniques is the major purpose of this research. Our proposed model will be utilized to produce closest result comparing to clinical outcomes. The proposed work is involved to conduce in the comparison of efficiency of distinct machine learning algorithms such as support vector machine (SVM), random forest, decision tree, and K-nearest neighbors (KNN). Few key factors are responsible for diabetes mellitus. Our proposed method focuses on those selective attributes for early detection of diabetes mellitus using predictive analysis method. The efficiency of each algorithm is evaluated by performance measure methods like sensitivity, specificity, positive likelihood ratio, negative likelihood ratio, disease prevalence, positive predictive value, negative predictive value, and accuracy. SVM obtained highest accuracy (77.78%) with lower error rate compared to other algorithms. The vital goal of this study is to assess the suitable classifier by comparing and analyzing the performance of four algorithms that helps the doctors and hospitals for early diagnosed of diabetes mellitus and proper plan of treatment. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Diabetes mellitus | K-NN | Machine learning | Prediction model | Random forest decision tree | SVM

Indexed keywords

Engineering controlled terms: Blood | Decision trees | Glucose | Learning systems | Nearest neighbor search | Predictive analytics | Risk assessment | Soft computing | Support vector machines

Document details - Performance Investigation of Cloud Computing Applications Using Steady-State Queuing Models

Advances in Intelligent Systems and Computing

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International Conference on Machine Intelligence and Soft Computing, ICMISC 2020; Guntur; India; 3 September 2020 through 4 September 2020; Code 254739

Performance Investigation of Cloud Computing Applications Using Steady-State Queuing Models(Conference Paper)

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Abstract

Cloud computing is the technology that was gaining the attention of most of the companies in market and utilization also increasing day to day by almost from companies to ordinary people. The working of these cloud models is effortless. A considerable number of servers are used to store the data and a vast amount of data and the service of providing data to the customers staying at remote locations too. Almost all cloud-based models are not free, and users need to pay a reasonable amount to use the services of these clouds. As the vast data is stored in these servers and the usage of this data by a vast number of customers, there is a chance of overcrowded at servers. Essential data or the hot data like the new movies, exam results or bank transactions, etc., can have the most of the crowds at various time intervals. Hence, it is required to analyse the number of customers is using the current cloud models at different intervals of time. Based on the results, the adjustments or the changes in the network model can be completed. In the current article, an attempt has been made to analyse a cloud model by considering the model working in study state and the performance was analysed for two queuing models. Several queuing models are available in research to analyse the performance of a queuing model. In the current article, the queuing models considered are M/M/1 and M/M/c models. The performance of the queuing models is analysed with various performance metrics of a network, or the cloud model is arrival rates to the model, service rates to the model, traffic density, throughput, etc. The results are displayed in the results section.

Author keywords

Cloud computing | Exponential distribution | M/M/1 | M/M/c | Queuing models

Indexed keywords

Engineering controlled terms: Artificial intelligence | Cloud computing | Sales | Soft computing

Engineering uncontrolled terms: Bank transactions | Cloud modeling | Network modeling | Ordinary people | Performance metrics | Queuing models | Remote location | Traffic densities

Engineering main heading: Queueing theory

Document details - Harmony Search Optimization-Based Direct Estimation of Harmonic Components

Lecture Notes in Electrical Engineering

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International Conference on Communication, Circuits, and Systems, IC3S 2020; Bhubaneswar; India; 16 October 2020 through 18 October 2020; Code 257539

Harmony Search Optimization-Based Direct Estimation of Harmonic Components(Conference Paper)

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Abstract

In this paper, harmony search (HS) method has been employed for estimating the accurate harmonic components present in voltage/current waveforms of power system, since the metaheuristic algorithms are more attractive for intricate optimization to solve the problems of nonlinear in nature with the high degree of variables. Unlike conventional estimation approaches, direct curve fitting-based approach is adopted in this paper for the nearest and quick estimation of different harmonic components of distorted voltage signals. Comparative assessment of the HS algorithm with particle swarm optimization (PSO) reveals the advantages in terms of convergence and accuracy. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Harmonics | Harmony search algorithm | PSO

Indexed keywords

Engineering controlled terms: Curve fitting | Harmonic analysis

Engineering uncontrolled terms: Comparative assessment | Distorted voltages | Estimation approaches | Harmonic components | Harmony search | Harmony search optimizations | HS algorithm | Meta heuristic algorithm

Engineering main heading: Particle swarm optimization (PSO)

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Risk Analysis in Movie Recommendation System Based on Collaborative Filtering(Conference Paper)

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Abstract

The main aim of any project or software is to provide customer satisfaction at the end. The problem in Movie Recommendation System is unusual recommendation of movies to users, i.e., liking and disliking of recommended movie. This problem or risk impacts customer satisfaction, as a result of which the software will not be used much by the end users, and the company will be in huge loss. So, this paper provides you a detail description of recommendation system, steps of how to analyze risks and how to tackle or mitigate them using genetic algorithm based on collaborative filtering approach. Single and multiobjectives were implemented. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Collaborative filtering (CF) | Genetic algorithm (GA) | Recommendation system (RS) | Risk management

Indexed keywords

Engineering controlled terms: Collaborative filtering | Customer satisfaction | Genetic algorithms | Motion pictures | Risk analysis | Risk assessment

Engineering uncontrolled terms: End users | Multi objective | Risk impact

Engineering main heading: Recommender systems

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Publisher: Springer Science and Business Media Deutschland GmbH

Dubba, N.; Koneru Lakshmaiah Education Foundation, Vaddeswaram, AP, India;

Document details - An automated detection of heart arrhythmias using machine learning technique: SVM

Materials Today: Proceedings

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An automated detection of heart arrhythmias using machine learning technique: SVM(Conference Paper)

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Abstract

Electrocardiogram (ECG) is widely used technique in study of heart beat irregularities such as cardiac arrhythmias, sinus rhythms and heart failure. It is a significant and popular technique to classify and detect the cardiac infraction. ECG signal analyses the electric activity of heart and outputs it in the form of waveforms which help in detection of heart irregularities. The main goal of this research work is to classify the arrhythmia with more accurate results in less computational time. The research is carried in machine learning technique- SVM classifier using Discrete Wavelet Transform (DWT). In this methodology, ECG samples of three different classes-Normal Sinus Rhythm, Congestive Heart Failure and Cardiac Arrhythmia were collected from MIT-BIH and BIDMC databanks. The collected signals were prepared into training set and testing set with a ratio of 70:30 percent respectively. Total 190 features were extracted from the prepared data using Discrete Wavelet Transform. DWT was chosen as it has the ability to vary the window size depending on the frequency. The extracted features were given to SVM classifier, which is best for classification purpose. The results were evaluated using the testing set and the final results were plotted using a confusion matrix. The performance accuracy of the model is 95.92 percent.

Author keywords

Arrhythmia | Classification | Discrete Wavelet Transform (DWT) | Electrocardiogram (ECG) | SVM

Indexed keywords

Engineering controlled terms: Biomedical signal processing | Cardiology | Classification (of information) | Discrete wavelet transforms | Diseases | Heart | Learning algorithms | Learning systems | Signal reconstruction | Support vector machines

Engineering uncontrolled terms: Arrhythmia | Automated detection | Cardiac arrhythmia | Discrete wavelet transform | Discrete-wavelet-transform | Electrocardiogram | Machine learning techniques | SVM | SVM classifiers | Testing sets

Engineering main heading: Electrocardiograms

Document details - Analysis of Quality, Installation of Power Supplied by APSPDCL to Urban and Rural Areas

Lecture Notes in Electrical Engineering

Volume 700, 2021, Pages 3295-3309

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Analysis of Quality, Installation of Power Supplied by APSPDCL to Urban and Rural Areas(Conference Paper)

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Abstract

This paper deals about the installation, supply, and quality of the power. It covers the installation of electricity service in the house, the time gap between installation and application, problems involved in connection, availability of power, power cut, alternative source of power, opinion on quality of power supplied, fault metering, damage of electrical appliances, etc. the different parameters such as electrification, power cut, alternative source of energy, power quality and fault clearing time by APSSDC, and damage of the electricity appliance due to poor power quality. The opinion of the respondents from urban and rural areas has not varied on the installation of electricity service, problems of electrical appliances due poor quality of power. There is no difference between urban and rural respondents' opinion on frequent causes of power cut and poor quality of power supply. This study is based on the primary data collected through structured questionnaire with related variables. The sample size of 740 respondents was chosen by using proportionate random sampling technique from among urban and rural domestic electricity consumers of Guntur district in Andhra Pradesh. © 2021, Springer Nature Singapore Pte Ltd.

Author keywords

Electric appliance | Installation | Power quality

Indexed keywords

Engineering controlled terms: Installation | Outages | Quality control | Rural areas | Signal processing

Engineering uncontrolled terms: Alternative source | Electrical appliances | Electricity consumers | Electricity service | Fault clearing time | Quality of power supply | Related variables | Urban and rural areas

Engineering main heading: Power quality

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Document details - Analysis of the Consumers' Satisfaction in Andhra Pradesh, Services Provided by Southern Power Distribution Company Limited

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Analysis of the Consumers' Satisfaction in Andhra Pradesh, Services Provided by Southern Power Distribution Company Limited(Conference Paper)

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Abstract

This works deals with the consumers' satisfaction on services rendered by APSPDCL. More power markets are needed in India. The analysis is carried out on advertisement given by the APSPDCL is affected the Indian power crisises, power cuts. The sample is drawn from different urban and rural areas of Guntur district like Brodipeta, Arundelpeta, Kothapeta, Old Guntur, Naaz centre, SVN Colony, Vidya nagar, Nagaram palem, Narasaraopet, Chilakaluripet, Tenali, Nandivelugu, Kolakaluru, Athota, Penumuli, Kancharlapalem, Pedaravuru, Kuchipudi, etc. The total number of customers for both the areas is 1,264,898. Out of which 758,939 (60%) are from rural area, and 505,959 (40%) are from urban area. Student test is conducted to know the significant difference of opinion of the respondents on the primary data has been interpreted with the help of simple statistical tools such as percentages, ranking method, Chi-square test of significance is administered to know the association between variables in the questionnaire. mean values of between two areas, i.e. urban and rural areas. The respondents of each category of urban and rural figuring in the sample are picked up by proportionate random sampling method; the results of the field survey revealed that advertisement has influenced the total sample respondents to some regarding global alliance bring benefits to India's power sector the in respondents from rural and urbans. It may be inferred that the need of more power markets in India is required which is very much evident from the recent constitutions of National Power Exchange Centres and State Trading Centres in the country. © 2021, Springer Nature Singapore Pte Ltd.

Author keywords

Electric power cut | Global alliance | Satisfaction | Services

Indexed keywords

Engineering controlled terms: Power markets | Signal processing | Statistical mechanics | Statistical tests | Surveys

Engineering uncontrolled terms: Chi-square tests | Global alliances | Guntur districts | Power distribution company | Random sampling method | Ranking methods | Statistical tools | Urban and rural areas

Document details - Lightweight Materials for Engine Cylinder Blocks/Liners—A Critical Review

Lecture Notes in Mechanical Engineering

2021, Pages 103-116

Conference on Innovative Product Design and Intelligent Manufacturing System, IPDIMS 2020; Rourkela; India; 2 December 2020 through 3 December 2020; Code 255669

Lightweight Materials for Engine Cylinder Blocks/Liners—A Critical Review(Conference Paper)

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Abstract

Lightweight Materials have become a choice for many industries like automobile and aerospace due to its tunable mechanical properties like extremely high strength to weight ratio. Aluminum is the best lightweight material. Al metal/alloy matrix composites improve the mechanical properties but lack wear resistance. By applying proper coatings will improve wear resistance. These Al MMCs are used to make engine parts like piston, connecting rod, engine cylinders, drum brakes, disc and cylinder liners. The present review is mainly about the properties of Aluminum Alloys in combination with different reinforcements produced by stir casting method and ultrasonic assisted stir casting method. And survey on the results of different reinforcements on the mechanical and tribological properties. In the present paper the use of composite materials and hard coatings explored so far are reviewed. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Al alloy MMCs | Engine applications | Tribological coatings

Indexed keywords

Engineering controlled terms: Aluminum alloys | Aluminum coatings | Composite coatings | Engine cylinders | Hard coatings | High strength alloys | Metallic matrix composites | Reinforcement | Tribology | Wear of materials

Engineering uncontrolled terms: Al alloy MMC | Al-alloy | Critical review | Engine application | High-strength | Lightweight materials | Stir casting method | Strength to weight ratio | Tribological coatings | Tunables

Engineering main heading: Wear resistance

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Document details - Experimental Analysis of Performance and Emission Characteristics of Four Stroke Single Cylinder VCR Diesel Engine Using Palm Biodiesel and Diesel Along with Comparison

Lecture Notes in Mechanical Engineering

2021, Pages 261-269

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Experimental Analysis of Performance and Emission Characteristics of Four Stroke Single Cylinder VCR Diesel Engine Using Palm Biodiesel and Diesel Along with Comparison(Conference Paper)

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Abstract

The immense importance of high energy demand with conventional fuels and the detrimental effects of pollution from fossil fuels, the focus is shifted toward the usage of alternative fuels. An initiative is considered to examine performance characteristics and magnitude of pollutants 4 strokes single cylinder VCR engine filled with diesel and palm biodiesel at a compression ratio of 18:1. Experimentation is carried out with diesel and palm biodiesel one at a time on a chosen engine at various loads. Performance evaluation contains the evaluation of brake power [BP], Brake Specific Fuel Consumption [BSFC], Brake thermal efficiency[BTE], etc. Emission analysis, the contents of CO%, NO_x (ppm), CO_2%, are measured by exhaust gas analyser. The Results reveal that the brake thermal efficiency of palm biodiesel fuelled engine is 29.01% at peak load which is more than the diesel by 20% moreover BFFC is 0.293 kg/KWH and is also less than the diesel by 30%. In the case of emission, NO_x with palm biodiesel is 415 ppm which sows 50% less than the diesel. While CO% and CO_2% are found to be 0.024 and 2.6, respectively, at maximum BP for palm biodiesel. It was observed from the carried out work, BTE was increased on par with the increase in load. It is inferred from the pragmatic condition that is considered to be a much promising substitute.

Author keywords

Diesel | Exhaust gas analyser | Palm biofuel | Smoke meter | VCR diesel engine

Indexed keywords

Engineering controlled terms: Alternative fuels | Biodiesel | Brakes | Carbon dioxide | Engine cylinders | Fossil fuels | Gases | Nitrogen oxides | Pollution | Smoke | Thermal efficiency

Engineering uncontrolled terms: Brake thermal efficiency | Diesel | Exhaust gas analyser | Gas analysers | Palm biodiesels | Palm biofuel | Performance characteristics | Single cylinders | Smoke meter | VCR diesel engine

Engineering main heading: Diesel engines

Document details - Fabrication of Low Temperature Stage for Atomic Force Microscope

Lecture Notes in Mechanical Engineering

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Fabrication of Low Temperature Stage for Atomic Force Microscope(Conference Paper)

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Abstract

The AFM is been used in imaging materials. Operating at low temperatures with some advantages of low thermal noise and drift, used for high resolution measurements. The study of physical phenomenon which occurs at low temperature is possible, for example superconductivity, phase transition, etc., can be studied. Due to all these benefits developing Low temperature AFM appears to be an interesting subject of study. In this thesis, development of a compact design for low temperature stage is done which includes cooling system and temperature controlling system. The main component of cooling system is a low temperature sample stage capable of archiving up to 86 °K. Four different sample stages are designed and fabricated. Experiment was performed on these four different sample stages, which gave the temperature variation with respect to time. By observing these temperature variation optimum sample stage is chosen. These cooling was done in vacuum of order 10^{-3} mbar vacuum. To achieve this order of vacuum roots pump and sorption was used in series. Roots pump used to create vacuum of 10^{-1} mbar of vacuum both in Atomic force microscope (AFM) and then AFM is evacuated with sorption pump to achieve vacuum of order 10^{-3} mbar. AFM scan at low temperatures has been performed. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

AFM (Atomicforcemicroscope) | Roots pump | Superconductivity | Temperature | Thermaldrift | Thermalnoise

Indexed keywords

Engineering controlled terms: Cooling | Fabrication | Pumps | Temperature distribution | Thermal noise | Thermoelectric equipment

Engineering uncontrolled terms: Atomic force | Atomicforcemicroscope | High-resolution measurements | Imaging materials | Lows-temperatures | Roots pump | Sample stages | Temperature variation | Thermaldrift | Thermalnoise

Engineering main heading: Cooling systems

Document details - Applicability of Empirical Correlations for Critical Heat Flux in Transfer Line Cool-Down Boiling

Lecture Notes in Mechanical Engineering

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Conference on Innovative Product Design and Intelligent Manufacturing System, IPDIMS 2020; Rourkela; India; 2 December 2020 through 3 December 2020; Code 255669

Applicability of Empirical Correlations for Critical Heat Flux in Transfer Line Cool-Down Boiling(Conference Paper)

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Abstract

The Cool down of move lines with the cryogenic liquids is a stream bubbling procedure having diverse warmth move regimes. In Cryogenic fuel move frameworks, high exactness numerical models are required for anticipating this two-stage stream bubbling procedure. The punishment of wasteful model leads into higher edge of structuring and working expenses. There has consistently been a drive to figure an all inclusive connection which can cover an expansive scope of liquids alongside the thermodynamic conditions for anticipating heat motion. These relationships anyway don't cover cryogenic liquids explicitly for transient chill off bubbling of move lines. Consequently, the expectation of this investigation is to confirm these two-stage heat move connections for anticipating basic critical heat flux (CHF) against accessible stream bubbling information for cryogenic liquids. Cryogenic quenching trial test information is looked at against accessible relationships and the mean outright deviation in anticipating most extreme warmth transition from every connection is introduced. Results obtained through this work means that the current relationships are unequipped for precisely anticipating the size of warmth move during the procedure words.

Author keywords

Chill-down | Critical heat flux | Cryogenic fuel | Flow boiling | Flow boiling | Horizontal pipe | Horizontalpipe | Liquidnitrogen | Quenching | Stream bubbling | Warmth transition

Indexed keywords

Engineering controlled terms: Bubble formation | Cryogenics | Liquids | Lubrication | Quenching

Engineering uncontrolled terms: Chill-down | Cryogenic fuels | Flow boiling | Horizontal pipes | Horizontalpipe | Liquidnitrogen | Quenching | Stream bubbling | Warmth transition

Engineering main heading: Heat flux

Document details - Design of Pico Hydro Power Plant Using an Impulse Turbine

Lecture Notes in Mechanical Engineering

2021, Pages 251-260

Conference on Innovative Product Design and Intelligent Manufacturing System, IPDIMS 2020; Rourkela; India; 2 December 2020 through 3 December 2020; Code 255669

Design of Pico Hydro Power Plant Using an Impulse Turbine(Conference Paper)

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Abstract

The practical design of Pelton wheel and analysis is made to measure the flow rate of rainwater entering into a small Pond by using a V-Notch weir. It was performed in a rural area with 65 houses. Every year during rainy season the amount of water used to go waste into the ponds without any utility for the people living in the rural areas with less population, the water during the rainy season flowing into the pond from the small drains into a large single connected single drain. In this paper a practical attempt is made to utilize the rain water by measuring the total flow rate of the rain water and after measuring based on the discharge obtained a small Pico hydropower plant is constructed using Pelton wheel and the amount of power is estimated. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Discharge | Flow rate | Pelton wheel | Pico hydro plant | V-notch

Indexed keywords

Engineering controlled terms: Hydroelectric power | Hydroelectric power plants | Lakes | Rain | Rural areas | Wheels

Engineering uncontrolled terms: Discharge | Hydro plants | Hydropower plants | Impulse turbines | Pelton wheel | Pico hydro plant | Pico hydros | Rain water | Rainy seasons | V-notches

Engineering main heading: Flow rate

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Venkatesh, P.H.J.; Department of Mechanical Engineering, Vignan's Institute of Information Technology (A), Visakhapatnam, AP, India;

Document details - Fabrication and Testing of Magnetic Plate Handling Truck

Lecture Notes in Mechanical Engineering

2021, Pages 241-250

Conference on Innovative Product Design and Intelligent Manufacturing System, IPDIMS 2020; Rourkela; India; 2 December 2020 through 3 December 2020; Code 255669

Fabrication and Testing of Magnetic Plate Handling Truck(Conference Paper)

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Abstract

The thick metallic plates are used in manufacturing industries like construction, Boiler manufacturing, Crane manufacturing, Wagons manufacturing, Heat exchangers etc. It is the one of the difficult task to handle these thick and large plates as they are heavy in weight and need to be lifted from one end manually before attaching to the crane slings. These plates are to be transported to various places in the factory for processing them to make into the final product, lifting and tying of the plates with the crane slings has to be performed many times during all kind of manufacturing process, which leads to the wastage of time, power consuming and risky process. In this paper a load carrying capacity of mild steel plate handling truck with magnetic lifting arrangement was designed using a SOLIDWORKS and fabricated the prototype model and tested. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Crane slings | Fabricated | Handling | Magnetic lifting | Mild steel plate | SOLIDWORKS

Indexed keywords

Engineering controlled terms: Cranes | Fabrication | Low carbon steel | Magnetism | Trucks

Engineering uncontrolled terms: Crane sling | Fabricated | Handling | Large plate | Magnetic lifting | Manufacturing industries | Metallic plate | Mild steel plate | SolidWorks | Thicker plate

Engineering main heading: Slings

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Document details - Optimum Design and Analysis of Bell Crank Lever for an Automobile

Lecture Notes in Mechanical Engineering

2021, Pages 189-208

Conference on Innovative Product Design and Intelligent Manufacturing System, IPDIMS 2020; Rourkela; India; 2 December 2020 through 3 December 2020; Code 255669

Optimum Design and Analysis of Bell Crank Lever for an Automobile(Conference Paper)

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Abstract

Bell crank lever plays a vital role in the automotive manufacturing process plant in which they are installed. An attempt has been made to design and analyze the bell crank lever using CATIA and ANSYS Simulation software. The analysis is made under static loading condition for different angles such as 60, 90, 135°. The bell crank lever with different materials such as Cast iron, Low carbon steel, Magnesium alloy, and Aluminum silicon carbide have been selected for similar operating conditions. It has been analyzed by varying lever angles for the different materials and comparison is made on the basis of Von mises stresses, strains, and deformations. The shape optimization process is applied to bell crank lever. Shape optimization process helps to remove unwanted material to ensure light weight of the component. In the shape optimization process different slots such as Tapered slot, Rectangle slot, and curved slots are considered by removing the unnecessary material from component. This technique of shape optimization reduces the mass and can make the component lighter so that it can withstand higher loading conditions. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

ANSYS simulation | Bell crank lever | Shape optimization | Stress analysis

Indexed keywords

Engineering controlled terms: ABAQUS | Aluminum alloys | Aluminum compounds | Cast iron | Elasticity | Finite element method | Magnesium alloys | Shape optimization | Silicon carbide | Stress analysis | Structural design

Engineering uncontrolled terms: Ansys simulations | Automotive manufacturing | Bell crank | Bell crank lever | Design and analysis | Loading condition | Optimum analysis | Optimum designs | Shape-optimization | Stresses analysis

Engineering main heading: Low carbon steel

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Document details - Application of Entropy—Deng's Similarity Approach for Optimization of Single-Point Incremental Forming Process Parameters of Titanium Grade 2 Sheets

Lecture Notes in Mechanical Engineering

Volume 23, 2021, Pages 297-312

International Conference on Advances in Industrial Automation and Smart Manufacturing, ICAIASM 2019; Nandyal; India; 26 July 2019 through 27 July 2019; Code 250529

Application of Entropy—Deng's Similarity Approach for Optimization of Single-Point Incremental Forming Process Parameters of Titanium Grade 2 Sheets(Conference Paper)

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Abstract

Incrementally forming sheet metals using a single ball-ended tool is one of steadfast areas in which industry is capable of focusing its attention in the future prospect appropriate to huge opportunities existing in automation. Because of low pace of production and action of spring back that effect the dimension, this process has not been adopted in industries. This technique can get better production rate by increasing the rotating spindle speed significantly. This present paper mainly reveals a multiple response optimization technique on process parameters of SPIF by using combination of entropy weight measurement method and similarity-based approach developed by Deng to find out the optimal parameters. Experiments for this study were designed using an orthogonal array, L27, according to Taguchi's method taking input factors namely the type of oil, feed rate, step depth, and tool diameter and spindle speed to obtain suitable responses. Optimum conditions were decided based on output response values and an experimental validation conducted using the above decided parameters. After validation, it has been found that there was an improvement of 9.80%. © 2021, Springer Nature Singapore Pte Ltd.

Author keywords

Deng's similarity-based approach | Entropy weight measurement method | SEM

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Document details - A Novel Design of Multiband Monopole Antenna Loaded with Complementary Split Ring Resonator

Lecture Notes in Networks and Systems

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6th International Conference on Information System Design and Intelligent Application, INDIA 2019; Visakhapatnam; India; 1 November 2019 through 2 November 2019; Code 249899

A Novel Design of Multiband Monopole Antenna Loaded with Complementary Split Ring Resonator(Conference Paper)

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[c]Nadimpalli Satyanarayana Raju Institute of Technology, Sontyam, India

Abstract

A novel patch antenna having Complementary Split Ring Resonator (CSRR) with meandered Coplanar Waveguide (CPW) fed is proposed in this paper. A compact 3 band structure is developed by engraving slots and meandered CPW fed on the radiating element. A triple-band antenna with its reduced size is achieved by etching circles outside the patch along with CSRR slots and with Modified Ground Plane (MGP). The proposed antenna displays acceptable results at all values of resonance, in terms of enhanced bandwidth, return losses, VSWR. The simulated results for different designs are discussed and compared among them. Parametric study is also implemented for different ring widths and etching of circles with different radius on the proposed design. In order to validate the results CSRR permittivity and permeability characteristics are explained. The proposed antenna with greater qualities is suitable for C-band, S-band, Wireless Local Area Network (WLAN), WIMAX applications. © 2020, Springer Nature Singapore Pte Ltd.

Author keywords

Bandwidth | Meandered | Permeability | Permittivity | Resonator | Scoplanar | Waveguide

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Sukanya, Y.; Vignan's Institute of Information Technology, Duvvada, Visakhapatnam, India;

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Document details - Service Layer Security Architecture for IOT Using Biometric Authentication and Cryptography Technique

Smart Innovation, Systems and Technologies

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Service Layer Security Architecture for IOT Using Biometric Authentication and Cryptography Technique(Conference Paper)

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Abstract

Data security and authentication mechanism is a very challenging job for smart devices. And more ever, IOT is suffering with login and verification process. Here, in our paper, we have focused on human characteristics-based security system which cannot be pinched easily such as iris, thumb, palm, DNA and voice-based authentication system. Using biometric authentication theory, we have presented that how biometric systems are the boundless computational resources and prospective of flexibility, reliability and cost reduction along with high-security performance resources. To maintain the security of biometric traits over the Internet channel, end user can apply the cryptography algorithm such as ElGamal, MAC Omura, Cramer–Shoup, RSA. As a final point, this paper is contributed for evidencing the strength of integrating the biometric authentication system with cryptography techniques and its application on Internet-based applications. In order to develop strong security, we have proposed an integrated approach of three mechanisms using biometrics, OTP and cryptography. The work is validated for biometrics through AVISPA (SPAN) security tool which is worldwide acceptable for approving the security architecture. © 2020, Springer Nature Singapore Pte Ltd.

Author keywords

AVISPA | Biometrics | Cryptography | OTP | Service layer

Indexed keywords

Engineering controlled terms: Authentication | Biometrics | Computation theory | Cost reduction | Cryptography | Manufacture | Reliability theory | Sustainable development

Engineering uncontrolled terms: Authentication mechanisms | AVISPA | Biometric authentication | Biometric authentication system | Computational resources | Cryptography algorithms | Internet based application | Service layers

Engineering main heading: Internet of things

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Publisher: Springer

International Conference on Innovations in Bio-Inspired Computing and Applications

IBICA 2019: **Innovations in Bio-Inspired Computing and Applications** pp 323–332

Design of Two Slot Multiple Input Multiple Output UWB Antenna for WiMAX and WLAN Applications

S. Malathi, S. Aruna, K. Srinivasa Naik & B. Bharani

Conference paper | First Online: 06 August 2020

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 1180)

Abstract

A compact and high effective two slot four element Ultra Wideband (UWB) Multiple input multiple output (MIMO) antenna is introduced in this paper. The proposed four element circular patch antenna of compact size with 4 × 4 cm^2 is mounted on a cheaper cost FR4 substrate. Where the slots of U and J are

Document details - Performance Analysis of Multilevel Converter with Reduced Number of Active Switches

Lecture Notes in Electrical Engineering

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Performance Analysis of Multilevel Converter with Reduced Number of Active Switches(Conference Paper)

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Abstract

In a multi-level inverter, as the number of levels increases there exists the problem of an increase in the number of active power switches particularly in high-power and low-voltage applications such as wind energy conversion system, UPS and photovoltaic inverters. Hence, this paper presents a novel technology which is capable of providing the same or more number of levels as that of the fundamental with reduced number of active switches. The proposed topology utilizes a DC link which is the combination of number of DC cells. The DC interface provides a variable DC connection voltage along with the regulated path through floating capacitors and provides the required degree of control for all inverter phases. The numbers of levels of the converter are increased by connecting the DC cells in a multi-cell structure. The five-level reduced multi-level converter (RMC) is compared with various other topologies such as single-phase five-level and seven-level cascaded H-bridge inverter in terms of number of active switches, and the results are validated through the percentage total harmonic distortions. © 2020, Springer Nature Singapore Pte Ltd.

Author keywords

DC link | Multi-level converters

Indexed keywords

Engineering controlled terms: Bridge circuits | Energy conversion | Information dissemination | Microelectronics | Topology | Uninterruptible power systems | Wind power

Engineering uncontrolled terms: Active power switches | Cascaded H-bridge inverters | Low-voltage applications | Multilevel converter | Performance analysis | Photovoltaic inverters | Total harmonic distortion (THD) | Wind energy conversion system

Engineering main heading: Electric inverters

Document details - Design of Metamaterial Loaded Dipole Antenna for GPR

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Design of Metamaterial Loaded Dipole Antenna for GPR(Conference Paper)

Pavani, T., Naga Jyothi, A., Ushasree, A., Rajasree Rao, Y., Usha Kumari, C.

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Abstract

A novel design of a dipole antenna for water detection is developed for ground-penetrating radar (GPR) system. The water decreasing day by day can increase the importance of the natural object water. Because of the degradation of surface water resources, the requirement for graphics of water resource is accumulated. GPR could be a promising machinery to find and establish formation of water. A dipole antenna incorporated with an inverted S-shaped metamaterial is proposed for GPR applications. The metamaterial-inspired antenna is designed on an FR4 substrate with overall dimensions of 100 × 300 mm. By placement of an inverted S-shaped metamaterial to induce additional resonance due to the occurrence of magnetic dipole moment, the antenna resonant frequency is changed from 1.88 to 1.71 GHz. The return loss and the VSWR plots have been studied along with the radiation patterns. © 2020, Springer Nature Singapore Pte Ltd.

Author keywords

Antenna GPR Metamaterial

Indexed keywords

Engineering controlled terms: Directional patterns (antenna) Geological surveys Geophysical prospecting Ground penetrating radar systems Machinery Metamaterial antennas Metamaterials Microelectronics Microwave antennas Natural frequencies Radar antennas Surface water resources Surface waters

Engineering uncontrolled terms: FR4 substrates GPR applications Ground penetrating radar (GPR) Metamaterial-inspired antennas Natural objects Novel design S-shaped metamaterials Water detection

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META

EC-decay of ^{133}Ba revisited by electron-gamma spectroscopy

Deepa, S. (Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, Anantapur (India). Department of Physics); Madhusudhana Rao, K. (Vignan's Institute of Information Technology, Visakhapatnam (India)); Vijay Sai, K. (Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, Anantapur (India). Department of Physics); Madhusudhana Rao, K. (Vignan's Institute of Information Technology, Visakhapatnam (India)); Dwaraka Rani Rao (Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, Anantapur (India). Department of Physics); Madhusudhana Rao, K. (Vignan's Institute of Information Technology, Visakhapatnam (India)); Venkataramaniah, K. (Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, Anantapur (India). Department of Physics)

2021

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Abstract

[en] Internal conversion electron and gamma-ray spectroscopy measurements were carried out on the 10.551 y ^{133}Ba electron-capture decay with our electron and gamma spectrometers—a mini-orange electron transporter paired to a Si(Li) detector and a large-volume HPGe detector, respectively. The relative and absolute gamma-ray intensities of all the nine transitions in ^{133}Cs were determined. We also report the relative conversion intensities of eighteen conversion lines and their corresponding internal conversion coefficients (ICCs), four of which are being reported for the first time. Transition intensity balance at each energy level, showed that the measured values are self-consistent. This exhaustive dataset of gamma-ray intensities, internal conversion electron intensities and the ICCs that have low uncertainty, will be highly valuable for the purposes of energy and efficiency calibration of semiconductor gamma ray detectors and electron spectrometers. (author)

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Country of publication	Hungary
Descriptors (DEI)	BARIUM 133, CONVERSION, ELECTRON CAPTURE DECAY, GAMMA SPECTROSCOPY, HIGH-PURITY GE DETECTORS
Descriptors (DEC)	ALKALINE EARTH ISOTOPES, BARIUM ISOTOPES, BETA DECAY, BETA DECAY RADIOISOTOPES, DAYS LIVING RADIOISOTOPES, DECAY, ELECTRON CAPTURE RADIOISOTOPES, EVEN-ODD NUCLEI, GE SEMICONDUCTOR DETECTORS, INTERMEDIATE MASS NUCLEI, INTERNAL CONVERSION RADIOISOTOPES, ISOMERIC TRANSITION ISOTOPES, ISOTOPES, MEASURING INSTRUMENTS, NUCLEAR DECAY, NUCLEI, RADIATION DETECTORS, RADIOISOTOPES, SEMICONDUCTOR DETECTORS, SPECTROSCOPY, YEARS LIVING RADIOISOTOPES
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Hybrid Security Approach for Database Security using Diffusion based cryptography and Diffie-Hellman key exchange Algorithm

Publisher: IEEE

M. Somasundara Rao ; K. Venkata Rao ; M. H. M. Krishna Prasad All Authors

Abstract: Data storage and retrieval is necessary for any organization. A large amount of data leads to data storage, processing and retrieval of the required data. Security is als... **View more**

Metadata

Abstract:
Data storage and retrieval is necessary for any organization. A large amount of data leads to data storage, processing and retrieval of the required data. Security is also another big challenge to protect data from unauthorized users. Database security is to protect data from internal and external threats. A legitimate user who has the proper credentials to access the organization's databases may, over time, send data outside the organizational network through a variety of channels, such as e-mail or crafted HTTP requests that encapsulate data. The database management system software helps monitor the access control mechanism and includes the inside threats using security configuration standards and protocols. We proposed a new security mechanism through encryption to enhance the security mechanism during the storing and retrieval process. This process will help to protect data from a legitimate users. The primary goal is to limit the authenticate users using the Diffusion based cryptography technique. The secondary goal is to encrypt the data while storing and retrieving the process. This can be achieved using the Diffie Hellman key exchange algorithm. The diffusion base encryption approach is the most popular cryptosystem based on the secrecy of the key rather than the secrecy of the algorithm. It is based on kerckoff's principle. It is best suitable to secure large data storage and retrieval through an encryption mechanism. The proposed system mainly focused on storing data in the database and retrieving data from the database with an encrypted mechanism. The main focus is to secure data from the inside and outside attackers. The key element is to avoid the misuse of data from the database by an outsider.

Original Research Article | Published: 15 October 2021

Modified Monopole–CDR Hybrid Antenna

Rahul Kumar Hindustani, Prakash Kumar Panda & Hemanta Kumar Sahu

Journal of Electronic Materials **50**, 6809–6817 (2021)

Abstract

This paper presents bandwidth enhancement of a monopole antenna by hybridization with cylindrical dielectric resonator (CDR) elements. Dual resonance of the monopole is obtained when the electric current distribution is controlled by adding metallic branches and metallic sphere components. Two prototypes are proposed, incorporating the dual monopole modes and hybrid automatic $(HEM)_{11\delta}$ mode of CDR elements, promising an ultra-wideband (UWB) response with an omnidirectional radiation pattern. The first prototype is composed of two CDRs and a monopole branch which gives an operating bandwidth of 67.25% (6.01–12.1 GHz). The second

Nuclei/Theory | Published: 29 December 2021

New Measurements of Internal Conversion Coefficients in ^{111}Cd

K. Madhusudhana Rao, K. Vijay Sai, E. Rajasekhar, Deepa Seetharaman, Dwaraka Rani Rao & K. Venkataramaniah

Physics of Atomic Nuclei **84**, 817–825 (2021)

Abstract

The 7.5-day beta decay of ^{111}Ag is studied with a 60 cc HPGe gamma spectrometer system and a high transmission Mini-Orange magnetic spectrometer. Precise gamma energies and relative intensities of fourteen gamma transitions and conversion electron intensities of sixteen conversion lines of eleven gamma transitions have been determined. Normalized Peak to Gamma method has been used for the determination of K and L conversion coefficients of most of the gamma transitions in ^{111}Cd for the first time, and compared with the theoretical values for assignment of multipolarities. The present conversion electron intensities would be of great use

ScienceDirect

Materials Today Communications

Volume 27, June 2021, 102206

Preparation and characterisation of new Ti/Fluorapatite/MWCNTs ternary nanocomposite and its catalytic activity in the synthesis of pyrazolo[3,4-b]quinoline moieties

Kranthi Kumar Gangu [a b], Vasantha Kalyani JVSK [a], Satya Guru T [a], Suresh Maddila [b c], Sreekantha B. Jonnalagadda [b]

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Abstract

We describe the preparation of a new ternary nanocomposite, (Ti/FAp/MWCNTs) constituting titania, fluorapatite and multiwalled carbon nanotubes. First, the fluorapatite (FAp) nanostructures were developed using glutamic acid as crystal growth modifier. The FAp was then reacted with functionalised MWCNTsand TiO_2 *via* sonication in ether. The Powder XRD, FT-IR, and microscopic analysis (SEM and TEM) of the new nanocomposite, Ti/FAp/MWCNTs revealed three phases. TiO_2 and FAp particle' sizes were between 50–60 nm and 40–60 nm diameter, respectively. The ternary nanocomposite demonstrated excellent catalytic efficiency for synthesising new pyrazolo[3,4-b]quinolones. The synergy between the Lewis acidic and basic sites contributed to the nanocomposite's effectiveness. Impressive yields (91–95 %) of quinolone derivatives were accomplished in short reaction time (*ca.*15 min) in the green solvent, EtOH at room temperature. Recyclability with consistent activity (>5 times) is the added advantage of the Ti/FAp/MWCNTs nanocomposite.

Graphical abstract

Original Article | Published: 01 June 2021

Design of Training Sequences for Multi User—MIMO with Accurate Channel Estimation Considering Channel Reliability Under Perfect Channel State Information Using Cuckoo Optimization

Uma Maheswari Ramisetty, Sumanth Kumar Chennupati & Venkata Nagesh Kumar Gundavarapu

Journal of Electrical Engineering & Technology **16**, 2743–2756 (2021)

Abstract

Designing the time domain training sequences is very critical in multi carrier transmission which degrades the performance as it is contaminated by different blocks in different cells. To improve the spectral efficiency and high accuracy, MU-MIMO needs the sensing matrix to be reduced by using the training sequence design and optimization. Integrating the training sequence design and sparse channel estimation improves the capacity of the system. The

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Ceramics International

Volume 47, Issue 7, Part A, 1 April 2021, Pages 8812-8819

Physical and *in-vitro* evaluation of pure and substituted $M_xCe_{1-x}O_2$ (M = Co, Fe or Ti and x = 0.05) magnetic nanoparticles

S.K. Alla [a b], A. Gangwar [a], S.K. Shaw [a], M.K. Viswanadh [c], K. Neogi [c], M.S. Muthu [c], Nidhi Gupta [d], Sher Singh Meena [e], P. Kollu [f], R.K. Mandal [a], N.K. Prasad [a]

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Abstract

High resolution TEM studies revealed the spherical morphology of $M_xCe_{1-x}O_2$ (M=Co, Fe or Ti, x=0.05) particles with their size in the range of 8–11 nm. Raman, UV and PL spectroscopy analyses evidenced that oxygen vacancy concentration modified with the type of dopants. The concentration of vacancies in the $Co_{0.05}Ce_{0.95}O_2$ sample was relatively higher and hence it had optimum magnetization value. The *in-vitro* cytotoxicity study for $M_xCe_{1-x}O_2$ (M=Co, Fe or Ti, x=0.05) nanoparticles against human lung adenocarcinoma (A549cells) was conducted. The results suggested that at a 10 μg/mL concentration, the undoped CeO_2 nanoparticles have shown cell viability up to 99%. In contrast, at the same concentration, the doped CeO_2 such as $Co_{0.05}Ce_{0.95}O_2$, $Fe_{0.05}Ce_{0.95}O_2$ and $Ti_{0.05}Ce_{0.95}O_2$ nanoparticles demonstrated the cell viability of ~97%. Furthermore, the samples displayed reliable biocompatibility up to 1000 μg/mL concentration. Interestingly, Co-doped CeO_2 nanoparticles exhibited relatively higher biocompatibility against A549cells at all concentrations. Further, the higher amount of vacancies might have improved the free radical scavenging effect and so the biocompatibility for the samples.

Introduction

Nanocrystalline cerium oxide (CeO_2) has attracted more attention in the scientific world because of its usage in *in-vitro* and *in-vivo* studies. The antibacterial and antioxidant activities of CeO_2 nanoparticles emerged due to their unique redox properties which are likely to protect the cells and organs from free radicals [1,2]. The anticancer activity even provides cytoprotection towards healthy cells and has additional benefit with these nanoparticles [3,4]. Moreover, the ability of CeO_2 nanoparticles for free radical scavenging is also

ScienceDirect

Applied Surface Science
Volume 560, 15 September 2021, 150025

Full Length Article

γ-Fe_2O_3 nanoflowers as efficient magnetic hyperthermia and photothermal agent

S.K. Shaw [a], J. Kailashiya [b], A. Gangwar [a], S.K. Alla [a c], Santosh K. Gupta [d f], C.L. Prajapat [e f], Sher Singh Meena [g], D. Dash [b], P. Maiti [h], N.K. Prasad [a]

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https://doi.org/10.1016/j.apsusc.2021.150025
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Abstract

Recent reports on the magnetic nanoparticles (MNPs) as an efficient and alternative photothermal agent have excited the researchers worldwide. While MNPs have been explored well for high heating performance during magnetic hyperthermia (MHT), their full potential is yet to be explored as an efficient photothermal agent. In addition, the simultaneous exposure of alternating magnetic field (for MHT) and near infrared irradiation (for photothermal therapy PTT) can drastically enhance the heating behaviour of MNPs. In the present work we explored microwave assisted polyol method to get γ-Fe_2O_3 nanoflowers. The use of sodium acetate in varying amounts, as an alkali source, allowed the modification of structural and magnetic properties leading to the formation of nanoflower with high heating performance during MHT and PTT. Role of defects in γ-Fe_2O_3 nanoflowers were investigated using photoluminescence spectroscopy which highlighted distinct role of oxygen vacancies and surface states. The nanoflowers with better crystallinity and relatively higher coercive field performed well during MHT. The observed high intrinsic loss power value of 15.21±0.34 nHm^2Kg^{-}as significantly higher than the commercially available ferrofluids and previously reported values for nanoflowers. During PTT, the therapeutic temperature of 42 °C was achieved for the aqueous suspension with a concentration as low as 100μg/mL which demonstrates the superiority of γ-Fe_2O_3 nanoflowers as an efficient PTT agent.

Graphical abstract

ScienceDirect

Journal of Alloys and Compounds
Volume 878, 15 October 2021, 160269

Structural and magnetic properties of nanocrystalline equi-atomic spinel high-entropy oxide $(AlCoFeMnNi)_3O_4$ synthesised by microwave assisted co-precipitation technique

S.K. Shaw [a], A. Gangwar [a], A. Sharma [b], S.K. Alla [a c], S. Kavita [d], M. Vasundhara [e], Sher Singh Meena [f], P. Maiti [g], N.K. Prasad [a]

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Abstract

Single phase equi-atomic $(Al_{0.2}Co_{0.2}Fe_{0.2}Mn_{0.2}Ni_{0.2})_3O_4$ high-entropy oxide (HEO) having spinel structure was synthesised employing simple and cost effective microwave assisted co-precipitation technique, followed by calcination at 500 °C. The material obtained was highly crystalline and stable at higher temperatures. The uniformity in elemental distribution was apprehended through STEM-EDS elemental mapping. The X-ray photoelectron spectroscopy confirmed +3 ionic state for Fe and Al, while other elements oxidised to higher ionic states to maintain charge neutrality. Ferrimagnetic behaviour was confirmed for the obtained HEO through magnetic characterisations.

Introduction

In recent years, the concept of entropy stabilisation to obtain a single-phase structure has been extended from high-entropy alloys (HEAs) to several classes of materials including carbides [1], borides [2] and oxides [3]. These materials contain five or more elements or ions in nearly equi-molar composition but have a single phase structure favoured by their high configurationally entropy [4]. While the HEAs were the focus of research for the last decade due to their augmented properties compared to conventional alloys, the current focus has been shifted to other high-entropy systems such as entropy-stabilised oxides or high-entropy oxides (HEOs) unfolding their potential application in energy storage [5], [6], catalysis [7], gnetic [9].

Effects of External Mixture Formation and EGR Technique on a Diesel-Fueled PCCI Engine

Bhiogade, Girish (*Department of Mechanical Engineering, Vignan's IIT Visakhapatnam, Vishakhapatnam, India*);
Suryawanshi, J. G. (*Department of Mechanical Engineering, VNIT Nagpur, Nagpur, India*)

Limitations on exhaust emissions of diesel engines have become increasingly stringent due to increasing awareness of environmental protection. This challenges diesel engine manufacturers to find a new balance between engine performance and emissions. Advanced combustion modes for diesel engines, such as homogeneous charge compression ignition (HCCI) and premixed charge compression ignition (PCCI), which can simultaneously reduce exhaust emissions and substantially improve thermal efficiency, have drawn increasing attention. In order to allow enough time to prepare the homogeneous mixture, the external mixture formation technique was used to achieve PCCI combustion. A device known as diesel vaporizer was used to produce diesel vapors. Diesel vapors mix with air at intake port of an engine to form homogeneous charge before combustion starts. Exhaust gas recirculation technique was used to control early ignition of the premixed charge. It was observed from the experimentations that the use of external mixture formation technique with EGR in PCCI engine decreases the NOx emissions by 43.57% but increases HC and CO emissions due to low temperature combustion. The brake thermal efficiency obtained was just 1.9% less than the conventional CI engine.

Publication:	Journal of The Institution of Engineers (India): Series C, Volume 102, Issue 1, p.99-107
Pub Date:	February 2021
Bibcode:	2021JIEIC.102...99B
Keywords:	CI engine; Diesel vaporizer; EGR; PCCI engine; NOx emission

Thermal frequency analysis of FG sandwich structure under variable temperature loading

B Sahoo, K Mehar, B Sahoo, N Sharma... - ... and Mechanics, An Int'l ..., 2021 - dbpia.co.kr

The thermal eigenvalue responses of the graded sandwich shell structure are evaluated numerically under the variable thermal loadings considering the temperature-dependent properties. The polynomial type rule-based sandwich panel model is derived using higher-order type kinematics considering the shear deformation in the framework of the equivalent single-layer theory. The frequency values are computed through an own home-made computer code (MATLAB environment) prepared using the finite element type higher-order ...

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Metals and Materials International
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Mathematical Models to Predict Flow Stress and Dynamically Recrystallized Grain Size of Deformed AA7150-5 wt% B_4C Composite Fabricated Using Ultrasonic-Probe Assisted Stir Casting Process

R. Seetharam[1] · Pagidi Madhukar[2] · G. Yoganjaneyulu[3] · S. Kanmani Subbu[4] · M. J. Davidson[2]

Received: 20 October 2020 / Accepted: 4 January 2021

Abstract
Mathematical models are among the new approaches employed to predict the properties of any material under various conditions. Mathematical models are essential for not only understanding the material properties but also estimating the cost of design, product life, and failure criteria of the product. Therefore, in the current investigation, the hot deformation (HD) behaviour and microstructure alteration of deformed AA7150-5 wt% B_4C composite was studied through a mathematical model. The new AA7150-5 wt% B4C composite was fabricated through an ultrasonic-probe assisted (20 KHz, 1000 W) stir casting process. The hot compression test was performed on a hydraulic press for various deformation temperatures (623–773 K) and strain rates (0.01–1 s^{-1}). Based on the outcome, it is inferred that the flow stresses and microstructures of AA7150-5 wt% B_4C composite was significantly altered during the hot compression test under various deformation conditions. The constitutive and dynamically recrystallized grain (DRXed) models were developed as a function of various deformation conditions of deformed AA7150-5 wt% B_4C composite, which was then applied to forecast the flow stress and grain size behaviour for different deformation conditions. The flow stress and DRXed grain size were obtained through the proposed constitutive and DRXed models are correlated with experimental results, with excellent accuracy. The models developed are reliable to predict the AA7150-5 wt% B_4C properties for various conditions.

Keywords DRX modeling · Constitutive equation · Grain size · Ultrasonication · Hot compression test

1 Introduction

Industries are always in search of new types of materials for structural applications with higher material properties like thermal, wear, and mechanical along with ease of manufacturing process reach the desired properties [1]. The characteristics like ultralight-weight, very high porosity, high compression, high energy absorption, and high strength with low thermal conductivity make these materials ideal for structural applications in marine industry, aerospace, military and automobile applications [2–4].

Ceramic micro-particles are mixed into the Aluminum (Al) alloys to improve its moderate material properties like hardness, ductile, strength, wear and other properties [5]. Since a couple of years, micro-particulates have been proposed to manufacture Metal Matrix Composites (MMC) and these evidence far better material properties when the particulates attain uniform distribution [6], as has been proved by experiments and mentioned in the literature by several researchers, particularly with respect to strength,

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THE PERFORMANCE ANALYSIS OF A PARALLEL COMMUNICATION NETWORK WITH PHASE TYPE TRANSMISSION HAVING NON-HOMOGENEOUS BINOMIAL BULK ARRIVALS UNDER EQUILIBRIUM CONDITIONS

[30 Jun 2021 | vol. 14 | no. 2 | pp. 1-20]

About Authors:

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Abstract:

In the current article, a three-node tandem and parallel communication network model having binomial bulk arrivals had developed and analyzed its performance under equilibrium conditions. The flow of packets from one node to the other nodes with respect to time is more important consideration in any network. But sometimes the network may not have the considerable amount of time to manage, consider and analyze the performance of each nodes in the network. An attempt had been made in the current article to study the performance of the current network model with various performance metrics of the network under equilibrium conditions. The messages arrived at the network are transformed into packets for forward transmission. After completing the transmission in the first node the packet may join buffer 2 or 3 which are in parallel and connected to node 1 with certain probabilities. The inter transmission time of packets in each node follows the Poisson process. The performance and behavior of the network is evaluated through deriving the explicit expression for various performance metrics of the network model like utilization of buffers at nodes, the throughput of each node, delay at each node, the total number of packets at each node etc. From the results, it is observed that the performance of the current network model is having a good impact on the network even if the transmission to the network is under equilibrium mode that is considering the network model without dependent on time.

Keywords:

Tandem Network, Equilibrium Conditions, Performance of the Model, Dynamic Bandwidth Allocation, Bulk Arrivals, Binomial Distribution, Non-Homogeneous Compound Poisson Process, Performance Evaluation

Turkish Journal of Computer and Mathematics Education *Vol.12 No.3(2021), 5176-5182*

Research Article

Cluster and Factorial Analysis Applications in Statistical Methods

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Article History: Received: 10 November 2020; Revised 12 January 2021 Accepted: 27 January 2021; Published online: 5 April 2021

Abstract: Cluster analysis is a mathematical technique in Multivariate Data Analysis which indicates the proper guidelines in grouping the data into clusters. We can understand the concept with illustrated notations of cluster Analysis and various Clustering Techniques in this Research paper. Similarity and Dissimilarity measures and Dendogram Analysis will be computed as required measures for Analysis. Factor analysis technique is useful for understanding the underlying hidden factors for the correlations among the variables. Identification and isolation of such facts is sometimes important in several statistical methods in various fields. We can understand the importance of the Factor Analysis and major concept with illustrated Factor Analysis approaches. We can estimated the Basic Factor Modeling and Factor Loadings, and also Factor Rotation process. Provides the complete application process and approaches of Principal Factor M.L.Factor and PCA comparison of Factor Analysis in this Research paper

Keywords: Cluster Analysis, Dendogrm, Factor Loadings, Factor rotation, hidden factors, Similarity and Dissimilarity.

1. Introduction

Cluster decomposition is a mathematical technique it disclose confederation and structures in material which through not formerly apparent, regardless are rational and serviceable erstwhile originate. Cluster decomposition is an pilot material decomposition contraption for deciphering stratification obstacle in statistical methods in Engineering and Industrial sectors. Its main research object is to sort out events like people into assemble, in order to intensity of sequence is vigorous allying extremity of same cluster. In investigation process individual cluster delineate, concerning of material provided, the order of designate to which its allying integration; and this portrayal may be epitomize through use from discrete to prevailing class.

The results of cluster decomposition may contribute to its properties and nature of a certified stratification conspiracy, for instance nomenclature for analogous organism, vegetation, or it may evince statistical mechanism to delineate inhabitants; or stipulate directive allocation to novel observations of clusters for testimonial patterns approaches. Factor Analysis is a combination of intrinsic decomposition and recurrent factor decomposition. It is surpassing Statistical approaches, factor decomposition has endured from incertitude review justification. If we consider the groove on numeral fluctuates anywhere between 100 to 200. We consider correlation or dispersion array but not originated groove.

The resolution of factors decomposition is to perceive influence in the relationship amidst fluctuates or elements of the given statistical data. Charles Spearman introduced Factor Analysis technique. As per his approach method immense range of trial of conceptual propensity assess of mathematical skills, glossary, other aesthetic competency, conjecture propensity are demonstrated by intrinsic aspect of imprecise intellect that was denoted as 'g' . If 'g' could be sustained then we consider a sub population community with alike score on 'g'. We can hypothesize that 'g' was aspect recurrent to all those aspects. Mathematical and conjecture potentiality and most psychologists agree that many other factors could be indemnified as well. In factor decomposition we can understand attitudes concerning foods, political polices, candidates, educational policies, industrial objects or many other kinds of objects.

2. Hierarchical Clustering Methods

The clusters at any juncture are attained by the fusion of two clusters from the previous stage, these methods lead to a hierarchical structure for the items given in test data. One such hierarchy is a tree diagram known as a dendogram. Hierarchical clustering methods are sued in many fields such as Biology, Numerical Taxonomy, Financial aspects, Marketing, Hospital, Military organizations etc.

Turkish Journal of Computer and Mathematics Education *Vol.12 No.3(2021), 5150-5155*

Research Article

A characterization of Commutative Semigroups

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Abstract: This paper deals with some results on commutative semigroups. We consider (s,.) is externally commutative right zero semigroup is regular if it is intra regular and (s,.) is externally commutative semigroup then every inverse semigroup is u – inverse semigroup. We will also prove that if (S,.) is a H - semigroup then weakly cancellative laws hold in H - semigroup. In one case we will take (S,.) is commutative left regular semi group and we will prove that (S,.) is $\prod$ - inverse semigroup. We will also consider (S,.) is commutative weakly balanced semigroup and then prove every left (right) regular semigroup is weakly separate, quasi separate and separate. Additionally, if (S,.) is completely regular semigroup we will prove that (S,.) is permutable and weakly separtive. One a conclusing note we will show and prove some theorems related to permutable semigroups and GC commutative Semigroups..

Keywords: Intra regular, H - semigroup, Inverse semigroup, Quasi separate, weakly separate, Permutable, Completely Regular semigroup, $\prod$ - Regular.

1. Introduction

Research on commutative semigroup has a long history. Lawson (1996) made a good case that the earliest article which would currently receive a classification in an 1826 paper by Abel which clearly contains cancellative commutative semigroups. A. semigroup s is commutative if the defining binary operation is commutative. That is for all X, Y in S the identity x.y =y.x holds. Although the term Abelian semigroup is sometimes used, it is more commonly referred as commutative semigroups. In this paper we present the results on Commutative semigroups. The motivation to prove the theorems is due to the results of J.M. HOWIE [1], P. SRINIVASULA REDDY and G. SHOBHA LATHA [2] Tamura, T. and Kimura, N [3]

Preliminaries

1.1.Definition: A semigroup (S, .) is Intra regular i.e., $xa^2y = a$

(or) $ya^2x = a$

1.2. Definition: A semi group (S..) is said to be H. Semigroup if

1. $x^2 = y = y^2 \Rightarrow x = y$

2. If x,y $\in$ S, u, v, $\in$ S and a positive integer n s.t. $x^n = uy$ and $y^n = vx$

1.3 .Definition: A semi group (S..) is said to be $\prod$- Regular. If $a^n = a^n x a^n \ \forall$ a, x $\in$ S and n is any positive integer

1.4. Definition: A semi group (S..) is said to be left $\prod$- inverse semigroup if it is $\prod$- regular and a = axa = aya $\Rightarrow$ ax = ay for all a, x, y $\in$ S (xa = ya)

1.5. Theorem: Every externally commutative right zero semigroup is right regular iff it is intra regular.

Proof: Given that (S,.) is externally commutative semi group $\Rightarrow$ axb = bxa if a, b, x $\in$ S

Let (S, .) be right regular

Now $a^2x = a$

$ya^2x = ya$

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Spectral Analysis for Diagnosing of Melanoma through Digital Image Processing

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Abstract

Cells known as melanocytes that are affected with some disorders and causes cancer in skin is known as malignant melanoma, is a special kind of skin cancer that develops from the pigments. The body that melanoma rarely effects the mouth eyes and intestines. It develops seriously day by day seriously that begins in the skin and able to spread rapidly to the other organs and sometimes causes death to the infected. It creates in the cells that produce melanin, which offers tone to the skin. The symptoms that are observed most commonly in moles. The moles starts expanding their size, this type of cancer appears mostly under the ages of 40 specifically women. The moles changes their shape to asymmetric shape, irregular border, change in regular colour, enlarges in ¼ diameters, sometimes itchiness and bleeding. Computer vision assumes a crucial part in Medical Image Diagnosing and it has been demonstrated by many existing frameworks. The Lesion Image examination devices checks for the different Melanoma boundaries.

Key words

Melona, Skin Cancer, Image Segmentation, Pre-processing, Edge Detection, Colour Thresholding, Blob detection.

1. Introduction

Causes are when the exposure to UV radiation, tanning lights and beds quickly builds the danger of melanoma. We can expect hidden where people cannot observe melanomas what develop under a nail mouth, digestive tract urinary tract or vagina, palms soles, scalp, gentiles where most people wouldn't check. Here is another problem that the identification of melanoma is somewhat difficult when the people having darker skin[1]. Acral lentiginous melanoma occurs in finger or toe nail. What we want to conclude that the hidden. Why we face cancer is abnormality that develops in skin. Sound new cells push more prepared cells toward your skin's surface, where they depart their life and at last tumble off, whereas certain cells foster DNA harm, new cells start to run wild and can at last shape a mass of carcinogenic cells. Figure 1 shows the skin and its layers functionality and anatomy, for reference to understand the introduction part of this work; note that all rights of the figure are reserved to Mayo Foundation for Medical Education and Research.

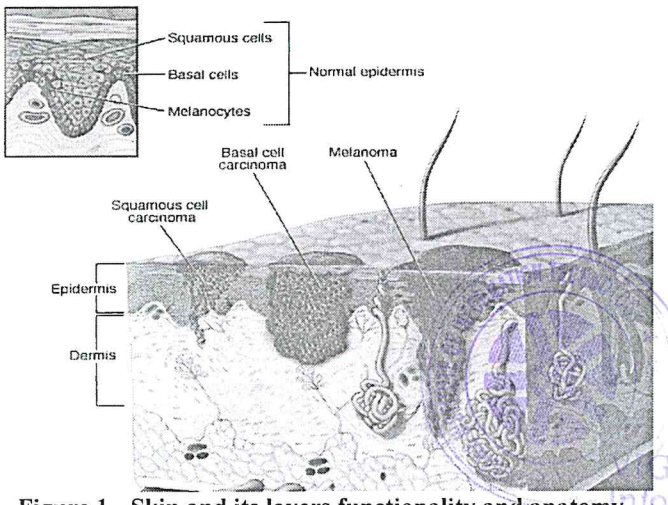

Figure 1 - Skin and its layers functionality and anatomy

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Full Length Article

Fuzzy adaptive selfish herd optimization based optimal sliding mode controller for frequency stability enhancement of a microgrid

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ABSTRACT

In recent power system, the quality of power is highly influenced by the imbalance between generation and load demand. Automatic Generation Control (AGC) is an imperative control strategy to minimize the frequency or power deviation by regulating the generation. In this work, a centralized Sliding Mode Control (SMC) is employed as AGC to achieve reliable performance of a Microgrid (MG). Due to existence of some poor inertia sources in MG, a knowledgeable and reliable controller is very indispensable. Wind turbine, photovoltaic unit, fuel cell, aqua-electrolyser, fly-wheel, ultra capacitor, battery energy storage units reside in MG with nonlinearities such as Generation Rate Constraint (GRC), communication delay and anomalous load. Further, a Small Hydro Power Plant (SHPP) is integrated with MG to enhance the performance response. The performance of the controller is enhanced by Selfish Herd Optimization (SHO) and a novel fuzzy adaptive SHO (FASHO). The decisive parameters of SHO are decided by fuzzy logic control by which the efficacy of algorithm is improved. The proposed FASHO based SMC controller is substantiated over SHO/FASHO based PID, FOPID and FOPID-(1 + PI) controllers. The proposed FASHO-SMC controller and integration of SHPP are wrapped up as superior approaches to enhance the performance of MG.

1. Introduction

Over the past several years, microgrids (MGs) have established well in the energy market, which is a model of shifting the power generation, transmission, and distribution from centralized power networks to decentralized mini/micro power networks. Moreover, the MGs supports the end users in the remote areas as well as to the localized urban areas with a low cost, uninterruptable, and quality power as compared to the power from the conventional power network. Also, the MGs curb the carbon emission which is detrimental to environment, and save the non-replenishable fuels. In the advent of advanced technologies, several distributed generators (DGs) like photovoltaic (PV) generator, wind turbines generator (WTG), diesel engine generator (DEG), fuel cell (FC), small hydro power plant (SHPP), battery energy storage (BES), fly-wheel (FLW), aqua-electrolyser (AEL), ultra capacitor (UCAP) etc. are integrated in the MGs. Operation, and control of islanded MGs are obfuscating in comparison to the grid connected one because, some sources provide less or zero inertia, like PV/storage units contribute zero inertia, and micro turbines provide less inertia. In addition to this, the stochastic solar irradiance, wind speed, and demand worsen the operation, and control of MGs exhibiting deviation in the system frequency [1,2]. This aberration of the system frequency is mitigated by automatic generation control (AGC) by sending proper control signal to the storage units (UCAP/FLW/BES) to pump up or absorb the energy in the MG. So, these energy storing devices ameliorate the system's stability and performance by compensating the power imbalance instigated by PV source, WTG, and demand.

In the foregoing years, several controllers from every corner of control theory have been developed to deal the frequency control efficiently in the MGs. Like conventional power system, various control levels such as primary, secondary, and tertiary control methods have been addressed for MGs in [3,4]. Further, the controller is structured in centralized or decentralized mode. Generally, centralized mode is preferable for isolated MGs operation,

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Implementation of Machine Learning Techniques for Effective Predictive Analysis in Health Care Management

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ABSTRACT

The health division has seen a huge transformation subsequent the introduction of latest computer technology & this has led to added medicinal information producing various sectors of research. In recent years, there has been surges in interest in study on assessment sustain appliances in healthcare, for example individuals relating to analysis, forecast, behavior forecast, and so on. This progress is due to increased data availability, breakthroughs in artificial intelligence and machine learning research, and contact to computational assets. Data Mining and Predictive Analysis are being used by a number of healthcare organizations. Predictive analysis utilizes assortment of statistical procedures as well as representation, machine learning & data mining to approximate the future by breaking into past and current realism. Appropriate to the information ambitious environment of machine learning algorithms, artificial intelligence trends has achieved its full prospective when back up by large information positions. Our study examines the implications of current breakthroughs in information analytics and how these will be used to the healthcare industry, with a focus on analytical & prophecy applications.

KEY WORDS: PREDICTIVE ANALYTICS, HEALTHCARE, MACHINE LEARNING, LEARNING ALGORITHMS.

INTRODUCTION

During rising national healthcare costs, healthcare companies need relationships dynamically to discover ways to lower costs without jeopardizing patient results. One of the strategies to achieve these goals is by focusing on patients who are likely to be readmitted to treatment, given that these individuals are a huge amount of administrative costs (Cucciare and O'Donohue, 2006). Government Accountability Office stated that 5 percent of Medicaid beneficiaries accounted for half of programme expenses (Quinn et al 2016). These patients generally face complex, permanent problems that are difficult to assess and control. If these patients are differentiated by healthcare providers, the latter can possibly reduce costs and help them manage their ailments better.

This research examines and perhaps benefits a strategy for distinguishing patients with and without the danger of readmission. These patients are supplied with solutions tailored to their specific needs and can be utilized to

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