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Engineering Science and Technology, an International Journal

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Full Length Article

Application of optimized adaptive crow search algorithm based two degree of freedom optimal fuzzy PID controller for AGC system

Jyoti Ranjan Nayak [a], Binod Shaw [a], Binod Kumar Sahu [b], Karanam Appala Naidu [c]

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Abstract

This work demonstrates Automatic Generation Control (AGC) of two and three area reheat thermal system with nonlinearities. A Two Degree of Freedom Optimal Fuzzy Aided PID (2DOF OFAPID) controller is applied in all areas as secondary controller. The performance of proposed 2DOF OFAPID controller is validated through a comparative study with PID, 2DOF PID, fuzzy PID with filter-fractional order integral and OFAPID controllers. The pertinent parameters, Rules (R_i) and Membership Functions (MFs) are established by using Crow Search Algorithm (CSA) and an Optimized Adaptive CSA algorithm. The relevant flight length (fl) of each crow in CSA is optimized by Sine Cosine Algorithm (SCA) and is entitled as Sine Cosine Algorithm Optimized Adaptive Crow Search Algorithm (SCAOACSA). The primacy of suggested algorithm over CSA and SCA algorithms is demonstrated by solving 8 benchmark equations. From the comparative results, the SCAOACSA based 2DOF OFAPID controller is corroborated as admirable strategy to shorten the frequency and power deviations of interconnected power system.

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Keywords

Automatic generation control; Two degree of freedom PID (2DOF PID); Two degree of freedom Optimized Fuzzy Aided PID (2DOF OFAPID); Crow Search Algorithm (CSA); Optimized adaptive CSA

Nomenclature

automatic generation control

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Journal of the Indian Chemical Society
Volume 99, Issue 7, July 2022, 100565

Typical superparamagnetism with improved electrical properties of nano modified bismuth ferrite multiferroic composites

Sreekanth K [a], Dhanalakshmi B [b], Dasari Madhavaprasad [c]

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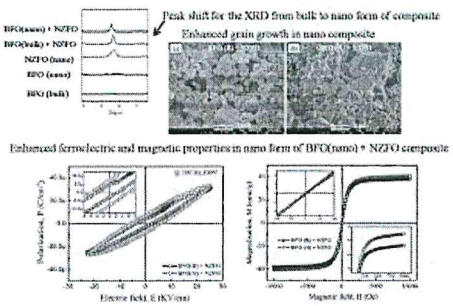
Abstract

Multiferroic composites with the chemical formula, (0.5) $BiFeO_3$+(0.5) $Ni_{0.5}Zn_{0.5}Fe_2O_4$, in bulk and nano forms were synthesized by preparing bismuth ferrite ($BiFeO_3$ or BFO) in bulk (B) and nano (N) forms and nickel zinc ferrite ($Ni_{0.5}Zn_{0.5}Fe_2O_4$or NZFO) in nano form. Single phase BFO was synthesized using conventional solid-state reaction as well as sol-gel autocombustion methods and NZFO powders were prepared by using sol-gel autocombustion method, respectively. X-ray diffraction (XRD) studies reveal the existence of rhombohedrally distorted perovskite structure for BFO and cubic spinel phase for NZFO in single phase as well as composite samples. Microstructural studies and energy dispersive spectroscopy (EDS) data reveal the formation of grains, intergranular porosities and chemical purity of the synthesized samples. Dielectric and AC conductivity measurements confirm the existence of space charge polarization along with the small polaron model in these composites. Ferroelectric and magnetic studies show that there was a considerable enhancement in the ferroelectric and magnetic orders for the nano form of the BFO (N)+NZFO composite. The observed remnant polarization values 2.80388 & 7.75901 $\mu C/cm^2$, saturation magnetization values 37.96072 & 40.47491emu/gm for bulk BFO (B)+NZFO and nano BFO (N)+NZFO composites, respectively. Interestingly, both the samples exhibit superparamagnetic behaviour at room temperature with coercivities close to zero. This typical behaviour is attributed to the corresponding anisotropic contributions originated from the individual constituents. The observed variations in BFO (N)+NZFO sample attributed to the corresponding structural modifications brought about by the variations due to its size effect in the present work.

Graphical abstract



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Chemical Engineering and Processing - Process Intensification

Volume 177, July 2022, 108985

Recent developments in utilizing hydrous ethanol for diverse engine technologies

Akshay Loyte [a], Jiwak Suryawanshi [a], Girish Bhiogade [b], Yuvarajan Devarajan [c], Ganesan Subbiah [d]

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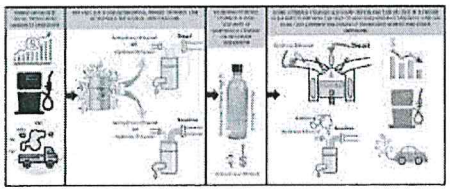
Abstract

This study presents the way to use renewable fuel like ethanol in its hydrous form. The higher cost required for anhydrous ethanol production beyond the azeotropic point is the need to use ethanol in the hydrous form. As ethanol can be produced from a renewable energy source using various bio-mass, many countries are targeting to increase ethanol usage as fuel. Specific methods for using hydrous ethanol in SI and CI engines are discussed. Blending hydrous ethanol with gasoline and diesel using various additives is a good alternative for using biofuel-like ethanol in its hydrous form. Combustion techniques like (GPI+EDI), HCCI, RCCI, and PCCI have incorporated hydrous ethanol, reducing harmful emissions like NOx and Soot with good energy conversion efficiency. Using hydrous ethanol as an engine fuel has shown reasonable cost savings in countries like the USA, India, and Brazil.

Graphical abstract



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Introduction

Projected Bharat Stage VI (BS-VI) norms by the countries like India have created a need to focus on using alternative fuels like biofuels to satisfy the projected emission norms. In addition, the scarcity of petroleum-based fuels like gasoline and diesel has focused on biofuels. Bio-fuels can be used in solid, liquid, and gaseous forms but usually apply to liquid biofuels. Biofuels are used when raw bio-mass is processed as an engine fuel in a more suitable form. Countries like India blend ethanol with gasoline in an average ratio of 5% among the biofuels. India also focuses on blending ethanol with gasoline to 20% in the coming years. The new bioethanol policy by the Indian Government has projected an investment of about 66 Crore USD, targeting the production capacity of 1-billion-litre ethanol. Compared

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Structures
Volume 41, July 2022, Pages 389-403

Experimental investigations of resilient hybrid fiber reinforced SCC beam-column subassemblies under cyclic loadings

Pritam Hait [a], Rituparna Mitra [b], Ehsan Noroozinejad Farsangi [c]

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Abstract

Fiber is not only minimizing the temperature and shrinkage cracks, but also increases the strength and toughness of the concrete. In this paper, steel fiber (SF) and areca leaf sheath (ALS) fiber have been introduced to enhance the overall performance of concrete in terms of ultimate strength, ductility, energy dissipation, and stiffness degradation. For this purpose, a one-third scaled reinforced concrete beam-column joint (RCBCJ) has been cast as the control specimen. Steel fiber reinforced concrete beam-column joints (SFRCBCJ) with volume fractions 1%, 2%, 3% and 4%; areca leaf sheath fiber reinforced concrete beam-column joints (ALSFRCBCJ) with volume fractions 1%, 2%, 3%, and 4%, and steel-areca hybrid fiber reinforced concrete beam-column joints (SAHFRCBCJ) (1:1 ratio) with volume fractions 1%, 2%, 3% and 4% have been cast. The joints were tested under cyclic loading using a large-scale actuator. It has been observed that the incorporation of SF and AL fibers has significantly enhanced the resilience and performance of joints in terms of ductility, ultimate load carrying capacity, stiffness degradation, and energy dissipation for all SFRCBCJ, ALSFRCBCJ, and SAHFRCBCJ specimens. However, the SAHFRCBCJ specimens have shown the optimum results in terms of performance and economical perspective compared to the other specimens. From the experiments, it has been observed that SFRCBCJ shows 27% higher load carrying capacity, 87% more dissipated hysteretic energy absorption capacity, 81% higher stiffness, and 41% higher ductility compared to RCBCJ subassemblies.

Introduction

Due to high tensile strength and ductile properties, fibers are added to concrete to enhance their performance. Fiber-reinforced concrete beam-column joint (BCJ) has a vital role in modern construction. The application of different types of fiber has been increased in many fields in last two decades.

A high-strength concrete beam-column joint was reinforced with high strength rebar to compare the performance of joints designed using code-based equations. A ratio of joint depth to diameter of the reinforcing bar in the beam was developed [1]. A reinforced concrete beam-column interior joint was strengthened using carbon fiber reinforced polymer (CFRP) sheets to shift the failure from column to beam region. Due to the use of CFRP, the crack length had been decreased by 37% of the control specimen [2]. Carbon fiber reinforced polymer (CFRP) concrete was strengthened using embedded steel bars. Results have shown that incorporation of the epoxy-coated steel bars enhanced joint shear strength, ductility, dissipated energy, and stiffness by 21%, 93%, 54%, and 35%, respectively, compared with beam-column joints without SF [3]. SF and polypropylene fibers were used to enhance the performance of beam-column joints in terms of stiffness degradation, energy dissipation, and damage index [4], [5]. Fiber-reinforced concrete (FRC)

Implementation of Harris Hawks optimization for load frequency control of hydropower plant

Devendra Potnuru, Lagudu Venkata Suresh Kumar, Bankuru Sonia, Yellapragada Venkata Pavan Kumar, Darsy John Pradeep, Challa Pradeep Reddy

Abstract

Hydropower has been used for many years and is essential to meet the renewable energy ambition of the world at present. In a hydroelectric power plant, voltage and frequency control are required, but, the voltage control could be done on the load side. In the present paper, frequency control using Harris Hawks optimization (HHO) for improved performance has been presented. Simulations are performed on the dynamic model of the hydropower plant and results are compared with the conventional PID that is designed using the Ziegler-Nichols method. The efficacy of the proposed algorithm is also tested at dynamic conditions of the hydropower plant.

Keywords

Harris hawks optimization; Hydropower plant; Load frequency control

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Refbacks

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An Efficient Method for Coronavirus Detection Through X-rays Using Deep Neural Network

P Srinivasa Rao [1], Pradeep Bheemavarapu [2], P S Latha Kalyampudi [3], T V Madhusudhana Rao [4]

Affiliations

PMID: 33438544 DOI: 10.2174/1573405617999210112193220

Abstract

Background: Coronavirus (COVID-19) is a group of infectious diseases caused by related viruses called coronaviruses. In humans, the seriousness of infection caused by a coronavirus in the respiratory tract can vary from mild to lethal. A serious illness can be developed in old people and those with underlying medical problems like diabetes, cardiovascular disease, cancer, and chronic respiratory disease. For the diagnosis of coronavirus disease, due to the growing number of cases, a limited number of test kits for COVID-19 are available in the hospitals. Hence, it is important to implement an automated system as an immediate alternative diagnostic option to pause the spread of COVID-19 in the population.

Objective: This paper proposes a deep learning model for the classification of coronavirus infected patient detection using chest X-ray radiographs.

Methods: A fully connected convolutional neural network model is developed to classify healthy and diseased X-ray radiographs. The proposed neural network model consists of seven convolutional layers with the rectified linear unit, softmax (last layer) activation functions, and max-pooling layers which were trained using the publicly available COVID-19 dataset.

Results and conclusion: For validation of the proposed model, the publicly available chest X-ray radiograph dataset consisting of COVID-19 and normal patient's images were used. Considering the performance of the results that are evaluated based on various evaluation metrics such as precision, recall, MSE, RMSE and accuracy, it is seen that the accuracy of the proposed CNN model is 98.07%.

Keywords: Coronavirus; SARS-COV-2; VGG19; chest x-ray radiographs; convolutional neural network; real-time – polymerase chain reaction.

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Issue 22, 2022

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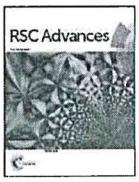

From the journal:
RSC Advances

The pioneering role of metal–organic framework-5 in ever-growing contemporary applications – a review

Kranthi Kumar Gangu [ab] Suresh Maddila [bc] and Sreekantha B. Jonnalagadda [*b]

Author affiliations

Abstract

MOF-5 with a Zn(II) cluster and terephthalic acid is a distinctive porous material among the metal–organic frameworks (MOFs), with unique physical, chemical and mechanical properties. MOF-5 based composites possess ample applications in modern chemistry. Huge surface area, suitable pore dimensions and scope of tunability make MOF-5 noteworthy in advanced materials. The extensive features of MOF-5 provided an opportunity for researchers to explore atomic/molecular scale materials. Various MOF-5 based composites have been designed with revamped properties appropriate to the application by altering and fabricating MOF-5 *in situ* or using a post-synthetic approach. Surface

A Novel Approach in Bio-Medical Image Segmentation for Analyzing Brain Cancer Images with U-NET Semantic Segmentation and TPLD Models Using SVM

Stephen Neal Joshua Eali | Debnath Bhattacharyya | Thirupathi Rao Nakka | Seng-Phil Hong*

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Abstract:

Many medical applications need to be able to separate and find brain tumor's using CT scan images. There have been a lot of recent studies that used distinguish between benign and malignant tumour to find out where and how big a tumour is. Even though they did well at segmenting the Medical Image Segmentation Decathlon (MISD) dataset, their complex structure requires more time for training and analysis. To build a flexible and efficient brain tumour segmentation system, we offer a pre-processing method that only works on a small part of the images instead of the whole Image. U-Net with three parameters Deep Learning models can be trained more quickly and with less overfitting with this method. Support vector machine is used in the second stage because there are fewer brain images for each slice. When U-Net+SVM looks at data this way, it can find both local and global features in it. The Three parameter method had shown to be more accurate at separating brain tumors from healthy parts of the brain than other models. The U-Net+SVM+Three Parameter Features method requires the tumour to be in the middle of the model and to be there. A lot of testing on the Medical Image Segmentation Decathlon (MISD) dataset showed that our model can get good results: Dice scores for overall cancer, more cancer and the core of the tumour are all 96%, which is the same for all three.

Keywords:

probability density function, U-Net, medical image decathlon, deep learning, supervised learning, brain cancer segmentation, support vector machine, expectation maximization (EM) algorithm

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Materials Today: Proceedings

Volume 60, Part 2, 2022, Pages 902-906

Performance analysis of uncoated tools for machining of hard to cut materials

V. V. Gopala Rao Lokireddi, S. V. Satyanarayana Vajrapu, Sarat Chandra Sai P, Vijay S

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Abstract

The concept of hard turning has gained considerable attention in the recent years in metal cutting as it can apparently replace the traditional process cycle, which comprises rough turning and heat treatment. As tool life is affected in hard turning process, it requires more cutting fluid. The present work deals with comparative performance of different tools in conventional dry turning process by varying speed, feed and depth of cut. Tool tip temperature, surface roughness and tool wear are measured for different cutting conditions. The relative influence of the different process parameters on cutting performance in machinability of hardened steel with minimum fluid application is analyzed.

Introduction

Cutting tools made of a single material may not be able to provide the necessary properties for continuous removal of the material from the work piece. In order to give the requisite properties for the cutting tools, proper cutting fluids or coolants are required. Machining of hard to cut materials is one of the active research areas where main focus is to achieve the efficient hard machining using low with minimum application of cutting fluid.

He et al. [1] applied dry and Minimum Quality Lubrication (MQL) while turning GCr15 steel. The Out of all the cooling conditions, the high speed spray effectively reduces the cutting forces. MQL generates higher surface finish than the dry cooling environment. Hadad and Sadeghi [2] also applied different cooling environments during machining AISI4140 steel. Cutting forces are greatly reduced with the application of MQL condition when compared to dry and flood cooling conditions. It also reduced the associated cutting temperatures effectively and thereby reduced the surface roughness. Sharma and Sidhu [3] used vegetable oil cutting fluid during machining of AISI D2 steel and obtained better surface finish when compared to dry machining. Attanasio et al. [4] applied MQL during the turning process of 100Cr6 steel and studied the effect of different lubricating conditions on the rake surface and flank surface. There is no much difference in case of rake surface tool wear between the MQL and dry condition lubrication. But there is a considerable reduction of flank surface tool wear is observed in case of MQL environment.

Khandekar et al. [5] used vegetable cutting fluid in the machining of AISI 9310 steel and observed that MQL based machining gives better machining quality with respect to cutting temperature and wear properties. Parida et al. [6] conducted machinability tests on Inconel 718, Inconel 625 and Monel 400 and concluded that tool life is lesser in case of machining of Inconel 718 when compared to the other two materials for the same machining environment. D'Addona et al. [7] conducted turning trials for machining of Inconel 718 at high speeds and investigated the tool wear and surface finish characteristics. Aouici et al., [8] conducted an experimental investigation using ceramic cutting tools

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Materials Today: Proceedings

Volume 60, Part 2, 2022, Pages 930-934

Design and fabrication of a parabolic solar water desalination system

V. V. Gopala Rao Lokireddi [a], Satyanarayana V.S.V. [a], Pavan Kumar D. [b]

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Abstract

The solar energy as renewable energy resources for desalination of water is novel, since it allows the daily use of renewable resources existed. Three phases are employed for desalination process. The first phase is preheating the pumped seawater, this is followed by steam generation phase by means of parabolic dish or trough collectors. The third phase is the condensation phase. An automatic sun tracking system is attached to parabolic dish or trough collector to increase the efficiency of solar energy collected during the day. Preliminary calculations suggest that the system could provide a temperature of 315 °C at least during the day with about 0.06 L/s of soft water, using parabolic dish of 4 m^2 surface area. Solar thermal energy had previously only be used in small-scale devices in rural regions for sea water desalination. The reason for this has mainly been explained by the relatively low productivity rate compared to the high capital cost. However, the coming shortage in fossil fuel supply and the growing need for fresh water in order to support increasing water and irrigation needs, have motivated further development of water desalination and purification by renewable energies.

Introduction

In general, India has a comparably long sunny season of more than ten months, with the rest of the year being partially cloudy. As a result, our country, particularly the deserts in the west, which consist of Rajasthan, Gujarat, Madhya Pradesh, and Maharashtra, has ample solar energy. Many initiatives have been undertaken to capture solar radiation and turn it into thermal energy, but none have proved successful. Several programs have been initiated to collect solar radiation and convert it into thermal energy, but the majority of these efforts failed to account for differences in sun angle of incidence by positioning the collector in a fixed orientation, which has an influence on the solar energy collected. Rosnani Affandi et al. [1] investigated the effect of solar irradiation, collector, and receiver on receiver losses in case of a parabolic dish system. The simulation tool was Matlab Simulink, and they employed a 25 kW PD system. Meteonorm 7 Software was used to obtain the irradiation data. In addition, they used the software to create a PD model and investigate the receiver losses in a PD system. The study indicated that lowering the intercept factor lowers the fraction of solar energy entering the receiver. As a result, the amount of solar radiation lost as it passes from the concentrator to the receiver will rise. Due to this, the intercept factor must be adjusted to enhance the fraction of solar power entering the receiver. Consequently, the amount of solar radiation lost as it passes from the concentrator to the receiver will be reduced. Bechir Chaouchi et al. [2] investigated the use of a parabolic solar concentrator to desalinate brackish water. A solar parabolic collector is used in the design model. The absorber is mounted at its focus, which is shaped like a cylindrical vase, with a receiving surface of 0.013 m^2 and a geometric concentration of 195. According to

Abstract

This paper considers a two degree of freedom quarter-car model of a four wheel vehicle with nonlinear spring travelling at a constant speed on a random road surface with a preview control to obtain the optimal vehicle response. The nonlinear spring behavior is assumed as a hysteresis and modelled by the Bouc–Wen model. This nonlinear vehicle model is linearized by using statistical linearization approach. The root mean square values of the control force, suspension stroke and road holding characteristics are determined by spectral decomposition method. The results obtained for the equivalent linearized model using the SDM are validated with Monte Carlo simulation, and the results show that the vehicle performs better using preview control.

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Effect of high temperatures on the behaviour of RCC columns in compression

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Abstract

Fire has become one of the most serious hazards to structures. Concrete constructions that are exposed to fire or high temperatures degrade and lose their strength as a result. The current research investigates the effect of high temperatures on columns built of reinforced cement concrete that are subjected to compressive loading. With a water binder ratio of 0.53, seven columns are cast, six of which are intended for fire exposure and one of which serves as a companion column. Specimens are heated to temperatures ranging from 100°C to 700°C in 100°C increments after 28 days of cure. After being exposed to high temperatures, the specimens were cooled to room temperature using an air-cooling method before being evaluated for loads at the first crack and ultimate failure loads. The variation of load at first crack, failure loads, and variation of residual strengths of RCC columns with an increase in temperature has been studied and presented. The heated columns have a lower load-carrying capability than the companion column, and the color of the heated columns changes when exposed to temperatures exceeding 300°C. The residual strength of the companion column was found to be 97.52%, 99.17%, 95.60%, 94.50%, 81.04%, 57.69%, and 49.86% for the columns exposed to temperatures of 100°C, 200°C, 300°C, 400°C, 500°C, 600°C, and 700°C, respectively.

Introduction

In recent times fire accidents are the most commonly occurring accidents in buildings and other structures. The fire remains one of the serious potential risks to most of the buildings and structures. The study of the behavior of concrete at elevated temperatures has significance in recent times due to the accumulated annual loss of life and property due to fire is comparable to the loss caused by earthquakes and cyclones [13]. This requires the development of a fire-resistant structural design. After tackling the fire hazard, the next step is to find the suitability of the building for retrofitting or repair. The main steps for finding the suitability of a fire-damaged building for repair involve assessment of fire severity, assessment of damage, and feasibility of repair. A brief review of the existing research on the behavior of reinforced cement concrete and its constituents under elevated temperatures considering parameters like compressive strength, flexural strength, temperature distribution, and other properties are presented. Ellingwood and Lin [2] (1991) studied the flexure and shear behavior of RCC beams at high temperatures. Six reinforced cement concrete beams were cast as a result of which all the beams failed in flexure rather than shear. Sanjayan et al. [22] (1991) conducted fire tests on two full-scale T-beams, one made of high strength concrete with silica fume and the other made of normal strength concrete. Thermocouples were installed at regular intervals inside the specimens to monitor the temperature distributions during the fire tests. From the results, it was concluded that high strength concrete appeared to be more prone to spalling in a fire than normal strength concrete.

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IoT for vibration measurement in engineering research

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Abstract

Study of vibrations gives an insight into mechanical behavior of the system or process. This is because vibrations are a direct effect of unbalance force. Higher the magnitude of vibrations, higher is the unbalance force. IoT has made instrumentation cheaper because of the availability of low-cost off-the-shelf sensors and opensource codes to use them. Accelerometers like ADXL335, ADXL345 and Gyro sensors like MPU6050 can be used for measurement of vibrations. IoT development boards like Arduino or Raspberry Pi has facilitated the implementation of this low-cost instrumentation with great ease. In this scenario, the current paper aims at providing an insight into use of these sensors for vibration measurement and their calibration techniques. Two case studies were done, where the authors have implemented these sensors and have been summarized. Also, an experimentation was conducted to study the vibration characteristics of SMA particulate Epoxy composite with increasing moisture content. During this process, pure epoxy as well as the particulate composite is exposed to pure water and sea water separately. Vibration Excitation is done by using DC motors with eccentric loading and frequency response is measured using ADXL345 and the results were discussed in this article. Accelerometers measure the variation of g-force and a test rig is designed and fabricated to measure the variation in g-force for different frequencies of excitation. A detailed discussion on the experimentation procedure and results are presented.

Introduction

Vibrations are a direct measure of unbalance in a system [1], [2]. They are also the cheapest way of monitoring the condition of a system [3]. Thus vibrations are used for conditional monitoring of various systems like IC Engines [4], in nuclear reactors where the vibrations may be mechanically induced or flow induced [5], plant commissioning and maintenance [6], damage assessment in structures [3] etc. Carden and Fanning [7] categorized vibration based conditional monitoring methods and summarized them. The frequency components that can be used for predicting various faults are summarized in [8].

Steve Hanly [9] summarized 6 ways of measuring vibrations with each of their advantages and disadvantages. Cost of each system along with their sampling rates are summarized in his blog. Whatever be the way of measuring vibrations, three basic quantities are measured in vibrations. They are Displacement, Velocity and Acceleration. Accelerometers can measure accelerations while gyro sensors can measure velocities as well as accelerations. The use of accelerometers in measuring vibrations for structural health monitoring is demonstrated in [3]. Acceleration measurement is mostly done when monitoring condition of the systems like indicating change in pressure in cylinder

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Investigation on tensile behaviour of Al/Si3N4/sugarcane ash particles reinforced FSP composites

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Abstract

Composite materials are less weighty, stronger or also cheaper. A composite material is usually composed of two or more identical or different metals. It examines the mechanical behaviour, in the production of specimens in different silicon nitride compositions, of Aluminium Alloy 6063 metal matrix composites with controlled (or) bagasse ash (BA) and silicon nitride distribution. The Stir Casting and Friction stir processing (FSP) method is used to fabricating the AMCs. The mechanical behaviour of the entire specimen is examined in comparison to the existing composite materials, such as the modification of the hardness, tensile and compression tests. The work is aimed at producing an absolutely new composite material and at examining its mechanical properties with various reinforcement compositions.

Introduction

The industry today requires a lightweight material for heavy use. There is, therefore, the need for the alternative materials which are incompatible with the present economic scenario and which do not add to heavy weight but support the existing industrial demand. For production and for production of new aluminium materials, the applications are known as aluminium matrix composites for material matrix, enhancement particles (B4C, Si3N4, AL2O3, BN, SiC, etc.), and aluminium matrix composites (AMCs). These guidelines shall be followed with due respect for composite materials, especially in the aluminium matrix composites (AMCs). Aluminium Matrix Composites are not only suitable for automotive, construction and industry applications, but also for sports and other trade industries due to their lower cost nature [1], [2], [3], [4], [5]. This is because particulate reinforcement materials cost less than fibre reinforcement. The metal or composite material's physical properties are the major determinants, but the microstructure mainly influences its physical characteristics. A microstructure is also essential to prevent failure under specified conditions. Secondary dendrite arm separation (SDAS), grain size, grain limit, can be predicted (SDAS). Electrical cable recycling is sustainable and economic, environmental and cost-effective. The sugar cane used in the bagasse ash production is a sugar plant source and produces electronic equipment for power supply [6], [7], [8], [9]. It is the source of the reinforcing agent of alumina and silica. Aluminum alloy material is the most frequently used metal matrix composite. Microstructural and sugar sugarcane wear details with changes from 0 to 9.0 percent weight and percentage strengthening's which are distinct to changes in the microstructure. LM6 micrographs to the basis alloy after adding several percent of the strengthening by volumes. It consisted of fine eutectic silicone dispersed in the interdimeric region of the alloy element and fine precipitates in the solid aluminium solution matrix [10], [11], [12].

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Research Articles

Microstructure, mechanical and wear property correlation of Al bronze alloys

Mahammad Ali Shaik & Brahma Raju Golla

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ABSTRACT

In the present work, the effect of Al content (0, 3, 5, 10, 15 wt-%) on the microstructure, mechanical and wear properties of Cu was systematically studied. Interestingly, the core–shell microstructure was observed in the Cu–Al alloys or Al bronzes with different layers of α-Cu, and intermetallic phases. The Cu–Al alloys displayed good compressive yield strength of 174–653 MPa, in particular, the Cu samples with Al (upto 10 wt-%) did not show fracture upto strain of 40%. Abrasion wear was the predominant wear mechanism in pure Cu and Cu–Al alloys after sliding against SiC. The Al addition to Cu drastically decreased the wear rate (198 $\times 10^{-3}$ to 3.8 $\times 10^{-3}$ $mm^3\ N^{-1}m^{-1}$) of Cu–Al alloys. The present work demonstrates the advantage of the addition of (5–10 wt-%) Al to Cu in achieving good combination of

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Proton microprobe analysis with 3 MeV and Si (Li) detector at Z<17 elements in charnockite composition

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Abstract

The low Z elements in the matrix charnockite composition are the problem, according to proton induced X-ray emission analysis with 3 MeV energy and a Si (Li) detector. The charnockite composition analysis with a proton microprobe is affected by the energy of the ion beam, the X-ray yield of a number of atoms, the ionisation cross-section, the energy-dependent detection efficiency of the semiconductor detectors used, and several other aspects. It's difficult to compute the absolute concentration of component Z<17 in an unknown charnockite matrix. As a result, modifying the dimensions of the detector, window, or incident proton beam energy can be used to evaluate light elemental sensitivity. Low Z elements in charnockite matrix materials can also be discovered using complementary analytical methods.

Introduction

Proton X-ray emission is used for element analysis in induced X-ray emission [1]. A beam of protons from an accelerator induces samples or targets, and the distinctive X-rays released are collected by Si (Li) detectors. Ions, or protons, with energies of 3 MeV ionise atoms in the target, and when triggered, the target emits distinctive X-rays. The emitted X-ray energy increases in a linear pattern as the atomic number increases. As a result, the energy of an X-ray peak is specific to a corresponding element, and X-ray intensities are proportional to elemental quantification [2].

The X-ray yield is affected by the number of atoms in the sample, the ionisation cross-section, the ion beam energy, the detection efficiency of energy-dependent semiconductor detectors used, and several other parameters. Determining the absolute concentration of an element in an unknown matrix is a tough task. In practise, determining the calibration curve of a measurement setup entails using reference materials and standards to identify sample composition. The concentration of elements with Z>16 can be determined with sensitivities of 1 ppm depending on the matrix sample type and measurement device [3].

With a thickness of around 5 mm, Si (Li) detectors have a significantly better stopping power and can be utilised for higher energy X-rays. The stopping power of detectors with a thickness of 2–5 mm provides superior protection against high-energy X-rays. Silicon, on the other hand, has a considerable benefit in that it generates separate X-rays at a lower energy (about 1.7–2 keV) [4]. As a result, fewer X-rays escape the detector volume, lowering the prominence of the escape peak. This means that the full energy peak to escape peak ratio of a Si (Li) detector is 2–3 orders of magnitude higher. i (Li) detectors operate in the energy ranges of a few hundred eV to more than 50 keV, and are used in a variety

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Experimental analysis on performance and emissions of diesel engine fueled with various blends of animal fat methyl ester

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Abstract

In modern days, transesterified oils are the best suitable alternative fuel for the existing Diesel Engines. Here, to extract the Bio-fuel, animal fat was dried and transesterified with an alkaline catalyst. In this article, the Performance and Emission characteristics of Animal fat Methyl Ester and its blends with diesel oil are analyzed in a direct injection Compression Ignition engine. The experiments were performed on a 4.4 kW, single cylinder, direct injection, air-cooled diesel engine. When compared to diesel, there is a little drop in brake thermal efficiency but a large improvement in carbon monoxide, hydrocarbons, and smoke opacity reduction. The results of the experiment suggest that using 20% of the mix improves performance while reducing emissions. The blends of Animal fat esterified oil (B20) are a good alternative fuel for diesel and could help minimize air pollution since they reduce exhaust emissions while also increasing brake power, brake thermal efficiency, and specific fuel consumption.

Introduction

In today's world, there has been dominant usage of diesel engines in both industrial transportation and farming fields as they have a better fuel efficiency. A Diesel power plant is another vital area in which diesel engines are used. Due to incredible growth in industrialisation and vehicle utilisation, there was a huge demand for the petroleum products like diesel and petrol. This increase in demand leads to the shortage of petroleum reserves and finally led to the huge rise in their costs. Another important factor to be considered is that air getting polluted due to the usage of diesel fuels which releases combustion gases into the atmosphere. The above facts have led to a search for alternative fuels based on renewable sources as they are more abundantly available and more uniformly distributed than diesel products. It was observed from the research advancements, the production of biodiesel is possible from plants like sunflower seeds, palm seeds, Mahua seeds, pongamia pinnata and animal fats, it has been used as an alternate fuel in the Diesel Engines.

Carbon monoxide, carbon dioxide, hydrocarbons, nitrous oxides, and others are emitted by the engine when it is fuelled with biodiesel. Except for oxides of nitrogen, which is slightly higher than diesel, the emission characteristics of biodiesel are improved in comparison to conventional diesel. Biodiesel can be used in any conventional, unmodified diesel engine and produces roughly the same performance as petroleum diesel. So, aside from the odour, the engine runs normally. The viscosity of transesterified vegetable/animal fat oils is lower than that of the parent oils. As a result, they improve the injection process and ensure better fuel atomization in the combustion chamber. Bio-diesel can be blended in any ratio to reduce emissions, and the increased lubricity improves vehicle performance. The amount of smoke produced by a diesel-powered vehicle is measured by its opacity, which is the degree to which smoke blocks

Deep Multi View Spatio Temporal Spectral Feature Embedding on Skeletal Sign Language Videos for Recognition

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***Abstract*—To build a competitive global view from multiple views which will represent all the views within a class label is the primary objective of this work. The first phase involves the extraction of spatio temporal features from videos of skeletal sign language using a 3D convolutional neural network. In phase two, the extracted spatio temporal features are ensembled into a latent low dimensional subspace for embedding in the global view. This is achieved by learning the weights of the linear combination of Laplacian eigenmaps of multiple views. Subsequently, the constructed global view is applied as training data for sign language recognition.**

***Keywords*—Laplacian eigenmaps; 3D convolutional networks; sign language recognition; multi view; skeletal data**

I. Introduction

Sign Language Recognition (SLR) is extremely coordinated movements of hands captured through sensors as 1/2/3D data and translated into text or voice by a machine learning interface [1]. Sign language is a communication medium for hearing impaired people which consists of hand movements and finger shapes that operate independently or collaboratively with respect to upper body parts. SLR is considered an extension of human action recognition (HAR) [2]. Automated HAR or SLR is accomplished through machine learning approaches on multi modal datasets such as RGB, Depth and skeletal information in image, video and data formats. The RGB and depth formats provide appearance information whereas the skeletal joint data exclusively models pose details. Although SL knowledge representation is largely modelled in RGB video formats, it is bottlenecked by motion blurring and spatial resolution of fingers with respect to the frame size. Therefore, the skeletal data has obtained wide acceptance for human action or sign language recognition problems. The 3D skeletal data has been used as vectorized, image and RGB video formats for recognition.

However, the pattern identification process on skeletal 3D video data for building a real time application is a supremely challenging task. Traditional models employed vectorized 3D data for recognition with deep neural networks(DNN) [3]. Above all the DNN models on 3D skeletal action data, long short-term memory (LSTM) [4] networks have shown greater reliability and robustness for HAR tasks. Similarly, 3D skeletal SLR on vectorized data was successfully designed and experimented with color coded Spatio-Temporal features [5]. Singularly, most of these methods presented results related to cross view testing with poor performance as these models received only single view training. As a result, the above methods failed to generalize on building a real time engine for HAR or SLR.

Meanwhile, the above problem is finding solutions in the form of multi view training on Deep Learning Models. Though multi view processing of video data is having 2 decades of research history, it has gained extensive attention in the last few years due to the progress in deep learning approaches. Earlier DNN proposed were constructed with multiple streams feeding into individual views independently whose Softmax scores are fused for getting a final recognition score. Later, learning approaches have trained multiple CNNs for each view and then learned the concatenated features in the dense layers. This approach has allowed for multiple views to share features across classes. Specifically, this process does not restrict the features that were not significant in the decision making. Additionally, the view specific features that play a major role in articulating the desired outcome are ignored.

To overcome the above challenges, we propose to learn a global synthesized target view by linearly combining the independent multiple views as suggested in [6]. However, these intra class independent views have shown to exhibit unequal similarities with other views which biases the result towards the false positives. Hence, to overcome this uniformity across views that influence the target class, we propose higher order Laplacian eigenmaps from [7]. This enables the target feature reconstruction to have a complete non uniform distribution across the multiple independent views. Consequently, we learn a nonuniform linear combination of weights on independent views which can be generalized for any target view. Finally, the synthesized target view features of all classes are classified using standard deep learning architectures. The proposed methodology called multi view spatio temporal feature embedding (MVSTFE) is illustrated in the following Fig. 1.

The proposed MVSTFE is investigated on our 3D skeletal video datasets of sign language (KLEF3DSL_2Dskeletal) [8] and four other multiview action datasets NTU RGB-D [9], SBU Kinect Interaction [10], KLYoga3D [11] and KL3D_MVaction [12]. The performance of the proposed deep networks was tested for the proposed method against the state-of-the-art on datasets. The remaining paper is clustered into four sections. The second section highlights the key historical aspects associated with multi view learning, sign language

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Analytical result of charnockites by PIXE and its comparison with other analytical technique XRF

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Abstract

The results of geochemical analysis of elements in matrix geological materials like charnockites by using the Proton Induced X-ray Emission technique are compared with other previous analytic results of X-Ray Fluorescence. In this investigation, PIXE has been used for elemental analysis of a variety of charnockite rocks in the form of a high-grade matrix at Charnockite hill, Eastern Ghats AP, India. The elemental concentrations in charnockites by using the present PIXE technique for multi elemental analysis are discussed from a previous study XRF of the exterior part of the charnockite analysis. The merits, limitations, and other factors of the experiments related to PIXE and XRF techniques in the case of elemental analysis of charnockite rock have been reviewed.

Introduction

In Precambrian mafic [1] igneous rocks, geochemical and petrologic investigations play an important role in establishing the evolution of the crust. Metamorphic rocks are found in most Precambrian [2] sites, and the rocks have been altered. The Charnockite series is a group of igneous rocks variably metamorphosed. They are widely distributed and occupy an important place in the geology of the Eastern Ghats, Visakhapatnam, Andhra Pradesh, India ( )-.

The hill as shown in Fig. 1, near the Visakhapatnam airport, is an inselberg made up of charnockites, pyroxene granulites, and charnockite pegmatites [3]. Allanite is observed in the palingenetic charnockites, and charnockite pegmatites and is the first reported occurrence from Visakhapatnam in the Eastern Ghats. Geologically, Visakhapatnam city, AP, India is characterised by rocks termed the Eastern Ghats. The rocks are Precambrian age and comprise mainly Khondalites, Leptynites, Pyroxene Granulites, and Charnockites, which include Biotite, Hastingsite, and apatite mineral compositions that have undergone a metamorphosis. In this investigation, the aim is to characterise the matrix charnockite minerals by using the PIXE [4] technique at various atomic number elements. The results obtained by PIXE (Table 1) of the matrix composition should compare with the previous results of charnockites with complementary XRF technique [5], which are published in various journals in the same area. Based on that, various factors related to the PIXE method with the comparison of previous XRF techniques have been discussed in the case of matrix geo materials.

Particle Induced X-ray Emission (PIXE) [6] is the technique where X-rays are induced by the impact of energetic ions due to the coulomb interaction between the incident ion and inner-shell bound electron, giving rise to the vacancy in the target atom. As a result of this created vacancy, an outer shell electron fills it, and the atom deexcites by emitting a characteristic X-ray. In multi-elemental samples, each element can be identified and quantified by referring to its

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Investigating the impact of artificial intelligence in education sector by predicting student performance

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Abstract

Machine learning is an integral part of artificial intelligence. Machine learning is capable of classifying the existing data and can predict and forecast results. The evaluation of student performance in educational institutions reveals the degree of effort that educational institutions should do in order to improve the poor or average learner. The importance of using EDM models is that they leverage prior data from students to forecast unanticipated or impending student performance. Though the educational sector employs a variety of techniques to extract meaningful information about the characteristics of students who participate in the learning process, a student performance assessment model is required to assist students and faculty in moving their performance to the next level. This paper describes a machine learning based framework for forecasting student performance. Model makes use of three machine learning algorithms namely- Support vector Machine, Random Forest and Regression Analysis. The experimental findings have demonstrated that the performance of SVM is concerned with the student's performance.

Introduction

In general, intelligence refers to the artificial fabrication of the human mind that can learn, plan, perceive, or understand natural language. Computer system theory and development are typically capable of executing human intelligence skills such as visual perception, voice recognition, choice, and language translation. The IT industry is primarily concerned with equipment that functions in the same way that humans do. John McCarthy defined AI as "scientific and technological knowledge for the construction of intelligent computer programmers." [1]

Machine learning and deep learning are two of the most widely used AI techniques. Individuals, companies, and government entities utilize these models to forecast based on data. Machine learning approaches are now being developed for the complexity and unpredictability of information in the food sector [2].

Machine learning is an intelligence branch (AI). Machine learning is designed to comprehend and adapt the structure of information to customer-understanding and usage models. Machine learning is an IT industry that varies from standard computer approaches. Algorithms are a collection of clearly written instructions used in traditional reasoning by computers to define or solve a problem. In order to give findings inside a specific range, computers might prepare data inputs for factual investigation using master learning approaches. It promotes computer frameworks to create models for test data in order to automate decision-making based on data inputs [3].

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Towards applicability of machine learning techniques in agriculture and energy sector

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Abstract

Machine learning includes wide range of algorithms for learning predictive rules from historical data and to build a model that can predict unseen future data. As a result, machine learning analyzes data samples to find patterns and create decision rules for developing a predictive model that can be used to forecast future data. A contemporary agricultural paradigm known as smart agriculture examines the entire farm as a collection of small units and finds abnormalities in output and demand for those units. The ultimate goal of smart agriculture is to reduce agricultural costs in order to increase profit. Smart farmers employ cutting-edge agricultural techniques. The predictive nature of machine learning algorithms enables smart farming. Wind speed prediction is necessary to increase the amount of energy produced. Power demand and price forecasting accuracy is regarded as one of the most important research issues in electrical engineering today and in the future. The predictive nature of various machine learning algorithms makes them the best instrument for dealing with energy and power engineering challenges.

Introduction

Data mining is a technique for extracting essential patterns and pulling out knowledge from huge set of records. That extracted pattern from the massive quantity of data is advantageous for many areas such as fraud detection, disease detection, market analysis, customer retention, science exploration, etc. depending upon the nature of data. Data mining uses a machine learning algorithm to discover relevant information from the massive data set. Machine (ML) techniques includes a wide range of algorithms for learning predictive rules from historical data to build a model that can predict future data [1].

ML includes wide range of algorithms for learning predictive rules from historical data and to build a model that can predict unseen future data. According to Arthur Samuel [10], machine learning is a field of computer sciences for providing an opportunity to a computer for learning from the data. Without programmed explicitly machines are fused with artificial intelligence and is capable to act and think as human being accepting machine learning and Bigdata techniques. Therefore we can say that Bigdata is employing data mining and data mining is employing big data for surely favorable investigation [2].

Algorithms based on machine learning require a large amount of clean data for training purposes, however virtually all datasets obtained from diverse sources are unreliable. For example, missing data, redundancy, outliers, and violations

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Structural and electrical properties of Ca doped $BiFeO_3$ multiferroic nanomaterials prepared by sol-gel auto-combustion method

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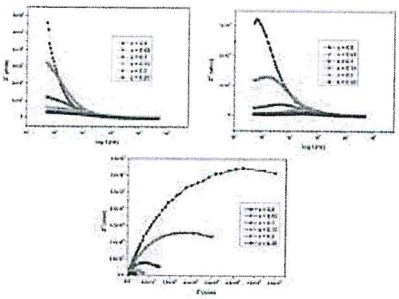
Abstract

Sol-gel auto combustion method was adopted for the synthesis of $Bi_{1-x}Ca_xFeO_3$ (x=0.00, 0.05, 0.1, 0.15, 0.2 and 0.25) multiferroic nanoparticles and their structural and electric properties were investigated. The two peaks at (012) and (110) planes at diffracting angles (2θ) of 31.9° and 32.1° in the XRD pattern indicates their rhombohedral structure with the R3c space group. The cole-cole plot in the 10Hz–1MHz frequency range shows the increasing semicircles shifting towards higher frequency, indicating increasing grain and grain boundaries.

Graphical abstract

Real, imaginary and cole-cole plots of Ca doped $BiFeO_3$ nanoparticles at 200°C temperature.



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Introduction

Multiferroics are defined as the materials that exhibit more than two ferroic properties in the same phase [[1], [2], [3]]. They are used for storing, sensing, electromagnets, spintronics etc. [[4], [5], [6], [7], [8]]. Bismuth ferrite has antiferromagnetic and ferroelectric transition temperatures at 643K and 1100K, respectively, and can be prepared either in bulk, thin-film or nano form [[9], [10], [11], [12]]. They have coupling properties useful for controlled magnetism [[13], [14], [15]]. $BiFeO_3$ (BFO) shows a rhombohedral structure with R3c space group with ~100μCcm^{-2}

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International Journal of Electrical Power & Energy Systems

Volume 137, May 2022, 107780

A Time-Frequency based backup protection scheme for enhancing grid security against power system blackout

Kasimala Venkatanagaraju [a b], Monalisa Biswal [b]

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Abstract

For the stable operation of the smart grid, the development of a faster, reliable, and secure protective relay algorithm is essential. From the past blackout reports, it is revealed that during different system critical operating conditions distance relay meets dependability and selectivity challenges and operates unnecessarily. To restrict the operation of distance relay only to fault conditions, an intrinsic time-scale decomposition (ITD) based backup protection scheme is proposed. The ITD method decomposes current signals into baseline and residual components. A reliable index is defined as the energy of a significant baseline component that has the highest kurtosis value. The energy-based index effectively accomplishes symmetrical fault-system stress events discrimination task. For technical evaluation of the method, different power system models such as the IEEE-39 bus test system and the Indian Eastern Region Grid (IERG) were considered and simulated using EMTDC/PSCAD software. The response of the method is compared with other existing techniques. The method uses an adaptive threshold selection approach to detect a fault condition and thus the response is independent of system configuration and structure. With this advantage, unintentional tripping of the power system during different critical operating conditions can be avoided.

Introduction

Modern power system is considered as one of the largest systems created by mankind. Tremendous improvements have been made in the electric grid to catch up with the growing demand for electricity but still, it gets stressed. This can cause insecure operation of the future smart grid and leads to invoking a major disturbance or even a blackout. As a result, the economy is paralysed with devastating effects on the population, way of life, and loss of communication services.

From the anatomy of the world's worst power system blackouts, it is noticed that failure in the protection system turns out to be the most significant factor for the occurrence of cascading events leading to a blackout. It was involved in about three-fourth of the reported grid disturbances [1], [2], [3]. To provide secured protection to the power system elements, relaying systems must isolate the faulty elements only during abnormal conditions.

Distance relay provides primary and backup protection for the transmission corridors. A time delay backup relay, such as zone-3 relay, is highly vulnerable to system critical or stress events such as power swing, voltage instability, and load encroachment due to its inherent zone settings [4], [5], [6]. According to its fault detection principle, whenever the magnitude of the apparent impedance measured at the relay location lies below the set value, the impedance trajectory should encroach the set protection boundary, but the same condition can happen under stressed events. It can also be

ScienceDirect

Biomedical Signal Processing and Control
Volume 74, April 2022, 103537

Optimal DeepMRSeg based tumor segmentation with GAN for brain tumor classification

G. Neelima [a], Dhanunjaya Rao Chigurukota [b], Balajee Maram [c], B. Girirajan [d]

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Highlights

- The highlights of the article are given below for your kind perusal. Kindly, consider and forward my article for further processes.
- **Proposed SPO-based Optimal DeepMRSeg for segmentation**: The proposed SPO-based Optimal DeepMRSeg is adapted for generating the segments considering pre-processed MRI. Here, the training of DeepMRSeg is done using proposed SPO, which is devised by combining SFO and PO for tuning optimal weights.
- **Proposed CAViaR-SPO-based GAN for brain tumor classification**: The proposed CAViaR-SPO is devised for determining the tumor from the MRI. Here, the training of GAN is done using proposed CAViaR-SPO, which is devised by combining CAViaR and SPO. Here, the SPO is obtained by combining SFO and PO.
- The proposed CAViaR-SPO-based GAN provided best performance with highest accuracy of 91.7%, highest segmentation accuracy of 90.0%, highest sensitivity of 92.8%, and highest specificity of 92.5%.

Abstract

The accurate and timely treatment of brain tumor is considered as an imperative part in effectual planning of treatment. However, the manual categorization of tumor in Magnetic resonance imaging (MRI) with same structures or appearance is complex that relies on expertise to discover brain tumor. This paper devises an automatic mechanism that can perform the cataloguing of tumor with MRI. The pre-processing is termed as initial measure to normalize intensity. Here, pre-processing is carried out with min-max normalization. The segmentation is performed with Optimal DeepMRSeg strategy, wherein the DeepMRSeg is trained using newly devised sailfish Political Optimizer (SPO) algorithm. The proposed SPO is devised by combining sailfish optimization algorithm (SOA) and Political Optimizer (PO). Then the Convolutional neural network (CNN) features are extracted and data augmentation is performed. The data augmentation, like random translation, randomized left or right flipping, brightness, rotation or adjustment of contrast is done with CNN. Then, the classification is done with Generative Adversial network (GAN), and trained using

frontiers in Energy Research

METHODS
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Design of Back-to-Back Converter Interface for Electric Spring in a Distribution System

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In a distribution system, the erratic output power of distributed generation causes fluctuations in the available power to critical loads on the demand side. A novel electric spring (ES) with back-to-back converter configuration is proposed. Besides PCC voltage regulation and power control, the proposed converter integrates the ES to the grid without compromising the DC link voltage and the quality of the grid current. It comprises an instantaneous DC link voltage control, active power control, PCC voltage control, and a hysteresis band current control. The systematic design of the parameters in the configuration is detailed. Simulations were performed in MATLAB/Simulink, and a series of comparative analyses at various control stages were demonstrated. The quality of the grid current was analyzed with PI, PR, and hysteresis band current controllers. It was established that the hysteresis band current controller gave the best performance. Similarly, the DC link voltage was efficiently regulated with the instantaneous DC link voltage controller than the conventional controller.

Keywords: electric spring, back-to-back converter, hysteresis band current controller, distribution system, voltage sag/swell

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1 INTRODUCTION

With the unpredictable renewables inhabiting a major stake in energy market, there is a shift from "power generation following the load demand" to "load demand to follow the generation" termed as the demand side management (DSM) (Westermann and John, 2007). In smart grids, DSM plays an effective operational role to optimize cost, power system reliability, and stability, profiting both consumers and utility operators (Nolan and OMalley, 2015). So, to handle the irregularity at both the supply and demand ends, DSM provides feasible solutions by making necessary changes in load consumptions. The power consumption of some loads is adaptively varied to match the fluctuating renewable power (Palensky and Dietrich, 2011). These loads that can withstand large variations of voltage/frequency for a short duration without interruption to consumer load operation are called as non-critical loads (NCLs), mainly heating and cooling loads (Lee et al., 2011). On the contrary, some loads require to be operated at an almost constant voltage and power supply. These are referred to as critical loads (CLs), mainly the military, computer, and hospital loads.

In this regard, it is crucial to modulate the power of an NCL. At the same time, there must be an effective method to regulate the mains voltage and provide grid support. Both these objectives are met

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Process Safety and Environmental Protection
Volume 159, March 2022, Pages 911-917

An ecofriendly and reusable catalyst RuO_2/MWCNT in the green synthesis of sulfonyl-quinolines

Singamsetty Harikrishna [a], Kranthi Kumar Gangu [d], Alice R. Robert [a], Himavathi Ganja [a], Nagaraju Kerru [b], Suresh Maddila [a c], Sreekantha B. Jonnalagadda [c]

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Abstract

A simple and efficient RuO_2/MWCNT nanocatalyst has been synthesized and thoroughly characterized by powdered XRD, SEM, SEM-EDX, TEM, and N_2 adsorption analysis. The catalytic activity of RuO_2/MWCNT nanomaterial was investigated in the effective green synthesis of sulfonyl-quinoline derivatives (5a–j) in higher yields applying a one-pot four-component reactions of substituted aldehydes, dimedone, phenylsulfonyl acetonitrile and NH_4OAc in ethanol. The conversion was high under optimal conditions. The catalyst material could be separated easily from the reaction mixture and recyclable eight times via simple filtration without considerable reduction of its catalytic efficiency. Simple handling, eco-friendly, inexpensive, excellent yields (91–98%), minimum reaction time (≤15 min), use of green solvent and easy work-up are the features of this methodology.

Graphical Abstract

ScienceDirect

Journal of Hazardous Materials
Volume 423, Part A, 5 February 2022, 127044

Novel Z-scheme binary zinc tungsten oxide/nickel ferrite nanohybrids for photocatalytic reduction of chromium (Cr (VI)), photoelectrochemical water splitting and degradation of toxic organic pollutants

Ravindranadh Koutavarapu [a 1], Ch. Venkata Reddy [b 1] ✉, Kamaluddin Syed [c], Kakarla Raghava Reddy [d] ✉, Tawfik A. Saleh [e], Dong-Yeon Lee [a], Jaesool Shim [b] ✉, Tejraj M. Aminabhavi [f] ✉

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Abstract

A simple hydrothermal approach was demonstrated for synthesizing a coupled $NiFe_2O_4$-$ZnWO_4$ nanocomposite, wherein one-dimensional $ZnWO_4$ nanorods were inserted into two-dimensional $NiFe_2O_4$ nanoplates. Herein, we evaluated the photocatalytic removal of Cr(VI), and degradation of tetracycline (TC) and methylene blue (MB) by the nanocomposite, as well as its ability to split water. The $ZnWO_4$ nanorods enriched the synergistic interactions, upgraded the solar light fascination proficiency, and demonstrated outstanding detachment and migration of the photogenerated charges, as confirmed by a transient photocurrent study and electrochemical impedance spectroscopy measurements. Compared to pristine $NiFe_2O_4$ and $ZnWO_4$, the $NiFe_2O_4$-$ZnWO_4$ nanocomposite exhibited a higher Cr(VI) reduction (93.5%) and removal of TC (97.9%) and MB (99.6%). Radical trapping results suggested that hydroxyl and superoxide species are dominant reactive species, thereby facilitating the Z-scheme mechanism. Furthermore, a probable photocatalytic mechanism was projected based on the experimental results. The photoelectrochemical analysis confirmed that $NiFe_2O_4$-$ZnWO_4$ exhibited minor charge-transfer resistance and large photocurrents. We propose a novel and efficient approach for designing a coupled heterostructured nanocomposites with a significant solar light ability for ecological conservation and water splitting.

Graphical Abstract

Abstract

Brain tumor is a severe nervous disorder that causes damage to health and often leads to death. Therefore, it is significant to classify the brain tumor at an early stage as it increases the survival rate of patients. One of the commonly employed imaging modalities for brain tumor classification is Magnetic Resonance Imaging (MRI). However, it is relatively complex to perform the brain tumor classification process due to the variations of type, shape, size and tumor location. To overcome such issues and classify the tumor more accurately, a deep learning classifier named Deep Maxout network is developed to classify the tumor into different grades. Based on the classification result, the features connected with the tumor grades are effectively acquired to make the survival prediction process. Deep learning is an effective and robust classifier model employed to perform the tumor classification or detection process with the MRI modality. Here, the survival prediction of tumor patients is carried out by the Deep Long Short-Term Memory (LSTM) classifier. Accordingly, the proposed method achieved higher performance using accuracy, sensitivity, specificity and prediction error with the values of 0.9434, 0.9324, 0.9202 and 0.0579.

Polymer Composites / Volume 43, Issue 2 / p. 1078-1089

RESEARCH ARTICLE

Effect of carbon nanotubes reinforcement on eigenmodes of multi-smart core sandwich composite cylindrical shell panels

A. N. Shankar, S. M. Murali Krishna, Rohinikumar Chebolu, Ajay K. S. Singholi, Rasmeet Singh, S. Rajeshkumar

First published: 23 December 2021
https://doi.org/10.1002/pc.26435
Citations: 7

Abstract

This study investigates the dynamic responses of carbon nanotubes (CNT) reinforced composite sandwich shells with multi magnetorheological elastomer (MRE) core. The CNT reinforced composite skin layers are made by using hand layup technique. An experimental modal test has been carried for with and without CNT reinforced composite cylindrical shells under clamped free condition. The 3D finite element model is verified by comparing the obtained natural frequencies with experimental results. The numerical results indicate that the CNT reinforced composite multi-MRE cylindrical sandwich shell greatly influences the natural frequencies compared with single-MRE cylindrical sandwich shell. The effect of many parameters on the natural frequencies of the CNT reinforced composite multi-MRE cylindrical sandwich shells is also discussed, including the weight percent of CNT, magnetic fields, and support conditions.

CONFLICT OF INTERESTS

Document details - Correction to: A novel compact fractal UWB antenna with dual band notched characteristics (Analog Integrated Circuits and Signal Processing, (2022), 110, 2, (349-360), 10.1007/s10470-021-01958-0)

Analog Integrated Circuits and Signal Processing

Volume 110, Issue 2, February 2022, Page 371

Correction to: A novel compact fractal UWB antenna with dual band notched characteristics (Analog Integrated Circuits and Signal Processing, (2022), 110, 2, (349-360), 10.1007/s10470-021-01958-0)(Erratum)(Open Access)

Devana, V.N.K.R., Satyanarayana, V., Lakshmi, A.V., Sukanya, Y., Kumar, C.M., Ponnapalli, V.L.N.P., Jagadeesh Babu, K.

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Original document

A novel compact fractal UWB antenna with dual band notched characteristics
(2022) Analog Integrated Circuits and Signal Processing, 110 (2), pp. 349-360.

Abstract

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A novel compact fractal UWB antenna with dual band notched characteristics(Article)

Devana, V.N.K.R., Satyanarayana, V., Lakshmi, A.V., Sukanya, Y., Kumar, C.M., Ponnapalli, V.L.N.P., Jagadeesh Babu, K.

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Correction to: A novel compact fractal UWB antenna with dual band notched characteristics (Analog Integrated Circuits and Signal Processing, (2022), 110, 2, (349-360), 10.1007/s10470-021-01958-0)
(2022) Analog Integrated Circuits and Signal Processing, 110 (2), p. 371.

Abstract

A very compact dual band notched fractal structured antenna is proposed for UWB applications. A novel fractal patch with defected ground structure is utilized to achieve –10 dB bandwidth of 7.87 GHz from 3.77 GHz to 11.64 GHz. To notch upper WLAN band of 5.52–5.90 GHz, an S- shaped slot is introduced in the 50 Ω microstrip feed line. The X- band notch for down link of satellite communication applications from 7.22–8.16 GHz is achieved by two symmetrical L- structured parasitics on both sides of fractal patch. The proposed antenna having a compact size of 16 × 21 mm^2 (0.2 λ× 0.26 λ) and is fabricated on a low cost FR- 4 substrate. A maximum gain of 4.32 dBi in UWB band with gain drops to –2.53 dBi in WLAN at 5.75 GHz and –4.25 dBi in X-band at 7.35 GHz are noticed. The proposed antenna shows good similarity between simulated and measured electrical parameters such as S_{11}, nearly omnidirectional patterns, constant gain and time domain characteristics makes it suitable for portable wireless applications.

Author keywords

Fractal | Slot | Ultrawideband (UWB) | WLAN notch | X- band notch

Indexed keywords

Engineering controlled terms: Antenna feeders | Defected ground structures | Defects | Directional patterns (antenna) | Fractals | Microstrip antennas | Microwave antennas | Omnidirectional antennas | Partial discharges | Satellite communication systems | Slot antennas | Time domain analysis | Wireless local area networks (WLAN)

Engineering uncontrolled terms: Band notch | Dual band-notched | Dual band-notched characteristics | Slot | Ultra-wideband(UWB) antennas | Ultrawideband | Ultrawideband applications | WLAN notch | X bands | X- band notch

Cited by 19 documents

Kempanna, S.B. , Biradar, R.C. , Kumar, P.
Characteristic-Mode-Analysis-Based Compact Vase-Shaped Two-Element UWB MIMO Antenna Using a Unique DGS for Wireless Communication
(2023) Journal of Sensor and Actuator Networks

Kumar, P. , MM, M.P. , Kumar, P.
Characteristics Mode Analysis-Inspired Compact UWB Antenna with WLAN and X-Band Notch Features for Wireless Applications
(2023) Journal of Sensor and Actuator Networks

Addepalli, T. , Manda, R. , Vidyavathi, T.
Design of novel compact eight-element lotus shaped UWB-MIMO antenna with triple-notch characteristics on hollow substrate
(2023) International Journal of Communication Systems

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Synergic deep learning model–based automated detection and classification of brain intracranial hemorrhage images in wearable networks

C. S. S. Anupama, M. Sivaram, E. Laxmi Lydia, Deepak Gupta & K. Shankar

Personal and Ubiquitous Computing **26**, 1–10 (2022)

Abstract

With an intention of improving healthcare performance, wearable technology products utilize several digital health sensors which are classically linked into sensor networks, including body-worn

Document details - Design from waste: an eco-efficient microwave absorber using dried banana leaves and charcoal based composite

Journal of Materials Science: Materials in Electronics

Volume 33, Issue 16, June 2022, Pages 13398-13407

Design from waste: an eco-efficient microwave absorber using dried banana leaves and charcoal based composite(Article)

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Abstract

The effective use of natural resources generates eco-friendly and biodegradable material for the future sustainability of society. In the quest for proper waste management, the present study proposes a dried banana leaves-based composite single-layer microwave absorber at a very low thickness of 1.50 mm in the frequency range of 1–20 GHz. The lossy character, as well as dielectric constant and conductivity of dried banana leaves, is found to increase with the increase of charcoal content and subsequently improve the absorption performance of the absorber. The dielectric properties and S_{11} parameters of the samples are measured using OCP (open-ended coaxial probe) method. The CST microwave studio (CST MWS) is also used to design the proposed absorber. The reflection loss attains the higher peak value of – 25.92 dB at 3.337 GHz with an absorption of 99.74%. The proposed microwave absorbing material can be used to develop an anechoic chamber and a low-cost substrate for designing an antenna.

Indexed keywords

Engineering controlled terms: Antennas, Charcoal, Dielectric properties, Microwaves, Sustainable development, Waste management

Engineering uncontrolled terms: Absorption performance, Biodegradable material, CST microwave studio, Dielectrics property, Eco-friendly materials, Frequency ranges, Microwave absorbers, Open-ended coaxial probe, Probe methods, Single layer

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Article

Tech Science Press

Improved Secure Identification-Based Multilevel Structure of Data Sharing in Cloud Environments

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Abstract: The Cloud Computing Environment (CCE) developed for using the dynamic cloud is the ability of software and services likely to grow with any business. It has transformed the methodology for storing the enterprise data, accessing the data, and Data Sharing (DS). Big data frame a constant way of uploading and sharing the cloud data in a hierarchical architecture with different kinds of separate privileges to access the data. With the requirement of vast volumes of storage area in the CCEs, capturing a secured data access framework is an important issue. This paper proposes an Improved Secure Identification-based Multilevel Structure of Data Sharing (ISIMSDS) to hold the DS of big data in CCEs. The complex file partitioning technique is proposed to verify the access privilege context for sharing data in complex CCEs. An access control Encryption Method (EM) is used to improve the encryption. The Complexity is measured to increase the authentication standard. The active attack is protected using this ISIMSDS methodology. Our proposed ISIMSDS method assists in diminishing the Complexity whenever the user's population is increasing rapidly. The security analysis proves that the proposed ISIMSDS methodology is more secure against the chosen-PlainText (PT) attack and provides more efficient computation and storage space than the related methods. The performance of the proposed ISIMSDS methodology provides more efficiency in communication costs such as encryption, decryption, and retrieval of the data.

Keywords: Data sharing; cloud environments; big data; chosen-plaintext attack; security

ScienceDirect

Materials Today: Proceedings

Volume 59, Part 2, 2022, Pages 1520-1525

Thermomechanical pretreatment of Al-Zr-Mg-Cr alloy to improve the performance through creep-age forming

Raj Kumar [a], B.S. Praveen Kumar [b] ✉, K.V. Pradeep Kumar [c], K.S. Raghuram [d], V. Ranjith Kumar [e] ✉, Chirag Vibhakar [f] ✉, M. Sudhakar [g] ✉

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Abstract

High-strength alloys are commonly treated with thermomechanical treatment to concurrently improve the alloy's forming and performance. Improved CAF processing method is presented in this research, which blends thermomechanical pre-treatment and CAF into a single process. CAF-treated Al–Zr–Mg–Cr alloys are projected to benefit from the suggested processing approach, which is expected to improve the alloy's forming efficiency and overall characteristics. This experiment looked at the creep-aging behaviour and characteristics of AA7475. Temperature mechanical pre-treatment causes more creep deformation than regression and re-aging or 3 percent pre-strain alone, according to the study's findings. Creep-aged materials with thermomechanical pre-treatment had mechanical, electrical, and erosion properties that were virtually equivalent to regression and re-aging-treated samples. In the creep-aged regression and re-aging pre-treatment sample, precipitates were observed at the coarse and discrete grain boundaries, as well as in the usual GP/phases and a 2-phase. Because of the reduced solute concentration in the matrix of the regression and re-aging pre-treatment sample, dislocations were able to move more easily, resulting in increased creep strain. This was more than made up for by the toughening effects of next stage and the hardening of disruptions. The thermomechanical pre-treatment procedure improves the creep forming and all the characteristics alloys comprising Al—Zr—Mg—Cr by providing an acceptable initial temper. The study's findings on Al–Zr–Mg–Cr alloys could boost CAF technology.

Introduction

Hindawi

BioMed Research International

Special Issue

Multimodal Photoacoustic Technology in Biomedical Applications

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Volume 2022 | Article ID 7799812 | https://doi.org/10.1155/2022/7799812

Show citation

Improved Artificial Neural Network with State Order Dataset Estimation for Brain Cancer Cell Diagnosis

D. N. V. S. L. S. Indira,[1] Rajendra Kumar Ganiya,[2] P. Ashok Babu,[3] A. Jasmine Xavier,[4] L. Kavisankar,[5] S. Hemalatha,[6] V. Senthilkumar,[7] T. Kavitha,[8] **A. Rajaram**,[9] Karthik Annam,[3] and **Alazar Yeshitla**[10]

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Academic Editor: Yuvaraja Teekaraman

Published: 16 Apr 2022

Abstract

Brain cancer is one of the cell synthesis diseases. Brain cancer cells are analyzed for patient diagnosis. Due to this composite cell, the conceptual classifications differ from each and every brain cancer investigation. In the gene test, patient prognosis is identified based on individual biocell appearance. Classification of advanced artificial neural network subtypes attains improved performance compared to previous enhanced artificial neural network (EANN) biocell subtype investigation. In this research, the proposed features are selected based on improved gene expression programming (IGEP) with modified brute force algorithm.

Document details - Manufacturing and mechanical properties of phenol Formaldehyde- Polyacrylonitrile based carbon composites for thermal protection system

Materials Today: Proceedings

Volume 59, January 2022, Pages 1714-1718

Manufacturing and mechanical properties of phenol Formaldehyde-Polyacrylonitrile based carbon composites for thermal protection system(Article)

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Abstract

The polymeric composite materials are a conventional solution to thermal protection that has been used to shield re-entry spacecraft. This paper presents the thermo- mechanical properties of polyacrylonitrile (PAN) based carbon fiber (Cf) reinforced with phenol formaldehyde resin (PR) composites for high temperature applications of thermal protection system (TPS). The Cf-PR composite laminates were made using the hand-layup method with a curing temperature of 150 °C and a weight of 100 kg/cm^2 for 4 h in a hydraulic hot press machine. The composition and microstructure of Cf-PR composite laminates were determined using X-ray diffraction (XRD), scanning electron microscopy (SEM), and energy dispersive X-ray spectroscopy (EDS). The mechanical properties of bar coal hardness were determined, including interlaminar shear stress (ILSS). The density was one of the physical properties that was examined. The thermo-mechanical properties of TPS for re-entry space vehicles were proved to be responsible for their high strength and high temperature applications. © 2022

Author keywords

EDS | Interlaminar shear stress | Phenol formaldehyde resin | Polyacrylonitrile based carbon fiber | SEM | Thermal protection system | XRD

Indexed keywords

Engineering controlled terms: Carbon carbon composites | Carbon fibers | Energy dispersive spectroscopy | Formaldehyde | Heat shielding | High temperature applications | Laminated composites | Phenols | Shear stress | X ray diffraction

Engineering uncontrolled terms: Composite laminate | High-temperature application | Inter-laminar shear stress | Phenol-formaldehyde | Phenol-formaldehyde resin | Polyacrylonitrile based carbon fiber | Resin-composites | Thermal Protection System | Thermomechanical properties | X- ray diffractions

Engineering main heading: Scanning electron microscopy

ScienceDirect

Materials Today: Proceedings

Volume 60, Part 1, 2022, Pages 658-667

Experimental study on replacing sand by M−Sand and quarry dust in rigid pavements

Barhmaiah Borigarla [a], Triveni Buddaha [b], Sai Kiran G [c], Pritam Hait [a]

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Abstract

In modern days of construction, many materials have alternatives that satisfy the characters of the replaced material. The present study is made to identify the replacement material for river sand in construction activities, as it is being difficult to acquire river sand in the coming days. Scarcity of river sand is on line. Materials namely Manufactured -sand (M−sand) and quarry dust is considered in this experimental study as100% replacements for river sand which is being used as fine aggregate (FA) in concrete. Characteristics like temperature difference, skid resistance and fatigue behavior of M−sand modified concrete, quarry dust modified concrete and conventional concrete are studied at optimum quantity (1.5 %) of super plasticizer. The mechanical properties of the modified concrete and conventional concrete were compared. From the results, it is observed that, the M −sand modified concrete seen better skid resistance of 12 mm and 11 mm higher as compared to quarry dust modified concrete on dry surface and wet surface respectively. Similarly, it is seen that 16mm and 12mm higher skid resistance than compared to conventional concrete on a dry surface and wet surface respectively. Moreover, the fatigue life of M−sand modified concrete is more than quarry dust modified concrete and conventional concrete. From the temperature readings it is observed that there is no significant variation in temperature differences between top and bottom of the slabs, the observed temperature readings are 12.1°, 11.6°C and 11.1°C in conventional concrete slab, quarry dust concrete slab and M−sand concrete slab respectively. However these values are less than the maximum value specified by code.

Introduction

Hindawi

Wireless Communications and Mobile Computing

Research Article | Retraction

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Special Issue

Machine Learning Enabled Signal Processing Techniques for Large Scale 5G and 5G Networks

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Research Article | Open Access

Volume 2022 | Article ID 3685419 | https://doi.org/10.1155/2022/3685419

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Energetic and Valuable Path Compendium Routing Using Frustration Free Communication Dimension Extension Algorithm in MANET

D. Veeraiah [1], G. Joel Sunny Deol,[2] Rajendra Kumar Ganiya,[3] **J. Nageswara Rao** [1], Suneetha Bulla,[4] and **Assefa Alene** [5]

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Academic Editor: Mohammad Farukh Hashmi

Published: 22 Mar 2022

Abstract

Chirality / Volume 34, Issue 7 / p. 989-998

RESEARCH ARTICLE

New enantioselective liquid chromatography method development and validation of dipeptidyl peptidase IV inhibitors using a macrocyclic glycopeptide (vancomycin) chiral stationary phase under polar ionic mode condition

Manikanta Swamy Arnipalli, Narendra varma Nimmu, S. N. Murthy Boddapati, Gangu Naidu Challa, Syed Jaweria, A. Emmanuel Kola

First published: 07 April 2022
https://doi.org/10.1002/chir.23448

Abstract

The direct separation of dipeptidyl peptidase IV (DPP-4) inhibitors such as Sitagliptin (STG), Linagliptin (LIG), and Saxagliptin (SAG) enantiomers in normal phase conditions have been achieved on immobilized polysaccharide-based chiral stationary phases (CSPs), as well as on the macrocyclic glycopeptide vancomycin chiral stationary phase (Chirobiotic V2) under polar ionic mode. The enantiomers of these targets could be separated completely (resolution factor Rs > 2) using the Chirobiotic V2 column in polar ionic mode with the mobile phase (MeOH/AcOH/TEA 100/0.3/0.1 v/v/v) in an isocratic elution at 1.0 ml min^{-1}. The effect of the mobile phase composition on separation, including buffer salts, acid–base modifiers, and analyte structures, was evaluated. The developed technique was validated in the polar ionic mode according to the International Conference on Harmonization (ICH) Q2R1 guidelines in terms of accuracy, precision, selectivity, linearity, limit of detection (LOD), and limit of quantification (LOQ). The calibration curve was linear in a concentration range from LOQ to 3.75 µg/ml. The LOD and LOQ of STG, LIG, and SAG were 0.15 and 0.45, 0.15 and 0.50, 0.16 and 0.50, respectively. The proposed method is said to be selective, accurate, and precise. Finally, the validated method was used successfully for the quantitative determination of DPP-4 enantiomers in pharmaceutical analytes.

Open Research

DATA AVAILABILITY STATEMENT

ScienceDirect

Materials Today: Proceedings

Volume 59, Part 3, 2022, Pages 1608-1614

Assessment of dimensional accuracy of 3D printed part using resin 3D printing technique

B.N. Dhanunjayarao [a b], N.V. Swamy Naidu [a]

Show more

https://doi.org/10.1016/j.matpr.2022.03.148

Abstract

Resin 3-Dimensional (3D) printing technology is known for complex parts with fine features and accurate dimensions for its high quality, high-resolution. The ability to print dimensionally accurate parts, depends on equipment, materials and slicer, few of which are layer height, orientation, and exposure time. The modern technology allows designers to visualizing the component before it is manufactured, which reduces the design's challenges. Manufacturers can take this advantage of 3D printing to manufacture the components directly, but accuracy and precision must be maintained to the close extent. The printed part is not completely cured during printing process and it requires post curing. Here, Ultra Violet (UV) laser light adopted for post curing, which causes dimensional inaccuracies, it may lead to clearance and fits problem. In general, 3D printed objects are prone to size inaccuracies, the most common of which are variations in the linear dimensions and hole diameter. The consequences of these two types of faults on the dimensional accuracy of a typical component were explored. This article shows the experimental results for dimensional correctness of post-cured parts printed using resin 3D printing process. The study aimed in presenting the errors associated with the dimensional accuracy along with the interaction effects of process parameters using Design of Experiments. The contour plots and pareto charts are also presented, in order to understanding the effect of factors and their levels on output measures and most influencing factors for dimensional accuracy (DA) respectively. Based on the findings, it was observed that the dimensional errors are causing due to shape and size changes in the part, many times the larger error bars are observed for internal and external diameters than the liner dimensions. From the interaction plots it can be concluded that layer height of 0.06mm is always referring to low deviation for all the output measures along with the exposure time of 3 and 5sec and 0^0 and 15^0 x-orientation.

Computer Systems Science & Engineering
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Article

Tech Science Press

A Novel Approach Based on Hybrid Algorithm for Energy Efficient Cluster Head Identification in Wireless Sensor Networks

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Abstract: The Wireless Sensor Networks (WSN) is a self-organizing network with random deployment of wireless nodes that connects each other for effective monitoring and data transmission. The clustering technique employed to group the collection of nodes for data transmission and each node is assigned with a cluster head. The major concern with the identification of the cluster head is the consideration of energy consumption and hence this paper proposes an hybrid model which forms an energy efficient cluster head in the Wireless Sensor Network. The proposed model is a hybridization of Glowworm Swarm Optimization (GSO) and Artificial Bee Colony (ABC) algorithm for the better identification of cluster head. The performance of the proposed model is compared with the existing techniques and an energy analysis is performed and is proved to be more efficient than the existing model with normalized energy of 5.35% better value and reduction of time complexity upto 1.46%. Above all, the proposed model is 16% ahead of alive node count when compared with the existing methodologies.

Keywords: Wireless sensor network; cluster; cluster head; hybrid model; glowworm swarm optimization; artificial bee colony algorithm; energy consumption

1 Introduction

Wireless Sensor Networks (WSN), the novel technology that stimulates innovative applications like industrial automotive monitoring, system controlling, plant or infrastructure maintenance, etc. The WSN comprises of diminutive and energized sensor nodes that are designated to monitor certain parameters

JJMIE

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Jordan Journal of Mechanical and Industrial Engineering

Optimal Response of a Quarter Car Vehicle Model with Optimal Skyhook Damper Based on Preview Control

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Abstract

In this paper, a two degree of freedom(dof) quarter car vehicle model with skyhook damper passing through a rough road is considered. The skyhook damper control parameters namely the spring constant and the damping coefficient which determine the optimal performance of the skyhook damper. The optimal parameters of the skyhook damper are obtained by equating the control force of LQR with preview stochastic optimal control to that of skyhook damper. The parameters of the skyhook damper suspension are optimized to improve the vehicle performance to the level of active suspension system with preview control given by a performance index which is a weighted integral of the mean square acceleration, road holding, suspension stroke and control force.

Keywords: Active suspension, Preview control, Optimization, Quarter car, Random road.

1. Introduction

Road inudced excitation is the mazor source of vibration of an automobile which causes the discomfort to the occupants. Researchers have been working to achieve a better ride comfort for the passengers (1-3). Mostafizur Rahman Md and Arafat Rahman (4) applied potential energy theorem to design a driver seat suspension for improving the ride comfort. They added a double negative suspension spring to the suspension system and obtained a significant reduction of seat suspension magnitude. The active suspension system enhances vehicle performance by generating control force through an actuator to counteract road stimulation. Semi-active systems are being developed in view of overcoming the limitations, like low robust, time lag and high cost, associted with the active systems. In this context, Crosby and Karnopp[5] introduced the concept of skyhook damper based semi active suspensions. The sky-hook logic is based on an ideal design of a passive damper connected between the suspension mass and a notional point fixed in the sky. In the case of a passive suspension of a spring and damper in parallel between the sprung mass and the un-sprung mass corresponding to a two degree of freedom vehicle model, or between the sprung mass and the wheel corresponding to a single degree of freedom vehicle model increases the passive damping ratio that leads to a harsher ride. Karnopp et al.,[6] used the skyhook concept in a moving vehicle and compared the performance of skyhook damper with conventional passive suspension system. In subsequent years, many authors have done research work in the area of skyhook damper design, but the performance of skyhook damper depends on the damper parameters. Sammier et al.,[7] used the skyhook damper type suspension to improve the road holding and ride comfort of vehicle model. Hamrouni et al.,[8] compared the performance of skyhook controller with the performance of CRONE Controller and simulation results and showed better performance compared to the skyhook controller. In the design of skyhook damper, selection of damper parameter values are important to enhance the performance of skyhook damper suspension system.

Different optimization methods have been developed to improve the vehicle suspension performance and applied to quarter car, half car and full car vehicle models. Vladimir and Marian[9] optimized the half car model suspension parameters, such as the spring stiffness and damping coefficients using Genetic Algorithm optimization method. Quantum- behaved particle Swarm optimization method has been used by Lee and Cheng[10] to optimize the 14-dof nonlinear railway suspension parameters. Xu et al.,[11] used Artificial Fish Swam Algorithm to optimize the hydro pneumatic and Mechanical Elastic Wheel suspension of quarter car vehicle model and results shown the improvement of vehicle ride comfort. Mustafa et al.,[12] introduced a new model-free fuzzy logic controller based on particle swarm optimization (PSO-MFFLC) for the nonlinear active suspension systems and compared the performance of PSO-MFFLC with the time-delay estimation control, intelligent PID and classical PID. Rajagopal and Ponnusamy[13] improved the performance of active vehicle suspension system using the hybrid DEBBO algorithm by tuning the parameters of PID controller.

Even the LQR control gives satisfactory performance, it can be further improved using preview control. In addition to the potential improvements in performance, preview control requires lower power, reduced requirements for internal sensors, and simplified feed back control structure. The objective of the preview control in

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Australian Journal of Mechanical Engineering ›
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Research Article

Moisture effects on vibration response of SMA particulate epoxy composite

H. RaviSankar, N. V. S. Shankar, Syed Kamaluddin, K Jitendra & V. Madhusudhan Rao

Received 16 May 2020, Accepted 24 Feb 2022, Published online: 16 Mar 2022

Download citation https://doi.org/10.1080/14484846.2022.2047471 Check for updates

ABSTRACT

High performance composites are the need of the day owing to their high-tailorable high-specific properties. Various composites like particulate composites, FRP are extensively used for various engineering applications. Recently, attention is being paid on smart composites where smart materials are being incorporated in plastics for developing new group of composites to enable the usage of plastics in structural engineering applications. One example is the

Hindawi

Security and Communication Networks

Special Issue

Computational Technologies for Malicious Traffic Identification in IoT Networks

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Research Article | Open Access

Volume 2022 | Article ID 4400412 | https://doi.org/10.1155/2022/4400412

Show citation

Development of the Broadband Multilayer Absorption Materials with Genetic Algorithm up to 8 GHz Frequency

K. Murali Krishna [1], Amit Jain [2], Hardeep Singh Kang [2], Mithra Venkatesan [3], Anurag Shrivastava [4] and **Sitesh Kumar Singh** [5]

Show more

Academic Editor: Muhammad Arif

Published: 17 Feb 2022

Abstract

A widely used genetic algorithm (GA) is endorsed to improve the design of a multilayer microwave radar absorbing material (MMRAM) which shows good absorption of radar waves over a broad frequency range. In this research, the authors have used genetic algorithm based on MMRAM which plays an important role in defense and civil applications. The scope of multilayer microwave radar absorbing material (MMRAM) is that it can absorb radar signals and reduce or eliminate their reflection. Its primary use is in defense and certain commercial enterprises. The multilayer RAM design demands the superiority of suitable materials to be used in different layers, a decision about multiple layers, and the optimum breadth of an individual layer. The permeability and permittivity of the materials varying with frequency in a fictitious material are used. The effect of change in thickness and the number of layers of RAM on reflectivity is studied. Since the material characteristics are frequency-dependent, different restrained conditions are used for frequency bands to identify the RAM that has good electromagnetic absorption in the frequency range of 1 to 8 GHz.

Table of Content

Open Access ARTICLE

Intelligent DoS Attack Detection with Congestion Control Technique for VANETs

R. Gopi[1], Mahantesh Mathapati[2], B. Prasad[3], Sultan Ahmad[4], Fahd N. Al-Wesabi[5], Manal Abdullah Alohali[6,*], Anwer Mustafa Hilal[7]

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Table of Content

An Optimal Deep Learning for Cooperative Intelligent Transportation System

K. Lakshmi[1], Srinivas Nagineni[2], E. Laxmi Lydia[3], A. Francis Saviour Devaraj[4], Sachi Nandan Mohanty[5], Irina V. Pustokhina[6,*], Denis A. Pustokhin[7]

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Optimal dense convolutional network model for image classification in unmanned aerial vehicles based ad hoc networks

I.S. Hephzi Punithavathi, S. Dhanasekaran, P. Duraipandy, E. Laxmi Lydia, M. Sivaram and K. Shankar

Published Online: February 14, 2022 · pp 46-57 · https://doi.org/10.1504/IJAHUC.2022.120944

Abstract

Unmanned aerial vehicles (UAVs) have the potential of generating an ad hoc communication network on the fly. Aerial image classification gains more importance in the remote sensing community and several studies have been carried out in recent days. This paper presents an optimal dense convolutional network (DenseNet) with bidirectional long short term memory (Bi-LSTM) based image classification model called optimal DenseNet (ODN)-BiLSTM for UAV based adhoc networks. DenseNet model is applied as a feature extractor, where the hyperparameters of DenseNet are tuned by the use of Adagrad optimiser. Secondly, the Bi-LSTM model is applied as a classifier, which classifies the aerial images captured by UAV. Detailed performance analysis of the proposed model takes place using UCM aerial dataset and the results are investigated under several dimensions. The ODN-BiLSTM model has provided effective image classification results with the maximum accuracy of 98.14% and minimum execution time of 80s.

Keywords

ad hoc networks, deep learning, image classification, unmanned aerial vehicle, UAV

Previous Article Next Article

Anonymization Approach

S. Sai Kumar, Anumala Reethika Reddy, B. Sivarama Krishna, J. Nageswara Rao, and Ajmeera Kiran

https://doi.org/10.1142/S0219265921410395 | Cited by: 110

< Previous

This article is part of the issue:
Supplementary Issue 1 — Blockchain Assisted Cyber Physical System for Cyber Security
Guest Editors: BalaAnand Muthu, Imran Shafique Ansari, Xuan Liu (yusuf)

Abstract

An optimal approach to anonymization using small data is proposed in this study. Map Reduce is a big data processing framework used across distributed applications. Prior to the development of a map reduce framework, data are distributed and clustered using a hybrid clustering algorithm. The algorithm used for grouping together similar techniques utilises the k-means clustering algorithm, along with the MFCM clustering algorithm. Clustered data is then fed into the map reduce frame work after it has been clustered. In order to guarantee privacy, the optimal k anonymization method is recommended. When using generalisation and randomization, there are two techniques that can be employed: K-anonymity, which is unique to each, depends on the type of the quasi identifier attribute. Our method replaces the standard k anonymization process by employing an optimization algorithm that dynamically determines the optimal k value. This algorithm uses the Modified Grey Wolf Optimization (MGWO) algorithm for optimization. The memory, execution time, accuracy, and error value are used to assess the recommended method's practise. This experiment has shown that the suggested method will always finish ahead of the existing method by using the least amount of time while ensuring the greatest level of security. The current technique gets the lowest accuracy and the privacy proposed achieves the maximum accuracy while compared to the current

International Journal of Electronics ›
Volume 110, 2023 - Issue 3

Research Articles

Neutralizing line based triple-band MIMO antenna with polarization diversity for WLAN/C/X band usage

Puspendu Bikash Saha, Dibyendu Ghoshal, Rajib Kumar Dash & Sourav Roy

Pages 405-425 | Received 03 Aug 2021, Accepted 05 Dec 2021, Accepted author version posted online: 08 Jan 2022, Published online: 08 Feb 2022

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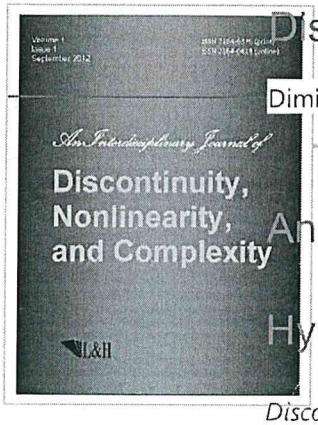
ABSTRACT

A four-element multiple-input-multiple-output (MIMO) antenna has been designed to operate at triple wide bands with improved port-isolation and polarisation diversity. The resonant modes of the MIMO are achieved by meander slot-loaded elliptical-shaped fundamental radiators, and the inter-port isolation is achieved by employing neutralising line-embedded ground plane. Apart from port-isolation, the proposed MIMO also offers polarisation diversity at different operating bands. The triple-band MIMO offers linear polarised radiation at WLAN band (4.2–5.6 GHz).



Discontinuity, Nonlinearity, and Complexity

Dimitry Volchenkov (editor), Dumitru Baleanu (editor)

Anisotropic Magnetized Cloud String Universe with Hybrid Expansion Law

Discontinuity, Nonlinearity, and Complexity 11(2) (2022) 315--323 | *DOI:10.5890/DNC.2022.06.010*

ISSN:2164-6376 (print)
ISSN:2164-6414 (online)

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Vishakhapatnam, Andhra Pradesh, India

Abstract

Anisotropic Bianchi type-III metric is studied with cloud strings and electromagnetic field in General Relativity. To get determinate solutions of field equations we have taken the help of (i) shear scalar proportional to scalar expansion proposed by Collins [1] and (ii) Hybrid expansion law proposed by Akarsu et al. [2]. We have obtained all the cosmological parameters corresponding to the model, also we have provided a physical discussion of our model using a graphical representation of these parameters. The physical and kinematical properties found in this model exhibit an accelerating expansion of the universe, which are compatible with current cosmological observations.

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Journal of Advanced Research in
Fluid Mechanics and Thermal Sciences

MHD Heat and Mass Transfer Steady Flow of a Convective Fluid Through a Porous Plate in The Presence of Diffusion Thermo and Aligned Magnetic Field

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Keywords: Diffusion thermo, Radiation absorption, inclined angle, aligned magnetic field, chemical reaction

Abstract

In the presence of a diffusion thermal and coupled magnet field effect, this manuscript seeks continuous free convective motion by a viscous, incompressible fluid that conducts electrically past a sloping platform via a porous medium. The free flow speed may be compatible with the exponentially tiny disrupting law. Two-term harmonic and non-harmonic functions solve dimensional-less control equations analytically. Detailed graphs are used to determine the budgets for tempo, temperature, and concentration for various limit calculations. Also, the numbers of Nusselt and Sherwood are given and evaluated with the graphs. Its sketches illustrate that the velocity profiles get reduced by the increase of aligned magnetic field parameter (α) and inclined angle parameter (ξ). Temperature profile is accelerated by rising heat absorption, Dufour number

Document details - Isolation enhancement of metamaterial structure MIMO antenna for WiMAX/WLAN/ITU band applications

International Journal of Microwave and Wireless Technologies

Volume 14, Issue 10, 6 December 2022, Pages 1315-1325

Isolation enhancement of metamaterial structure MIMO antenna for WiMAX/WLAN/ITU band applications(Article)

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Abstract

The-negative metamaterial (MNG) two-element MIMO antenna design was proposed in this article for WiMAX (2.5-2.8 GHz), WLAN (3.2-5.9 GHz), and ITU band (8.15-8.25 GHz) applications. The first design of the MIMO antenna operates at 2.7 and 4.9 GHz frequencies. In order to reduce the mutual coupling, a defective ground structure is used. For further isolation improvement, an MNG unit cell is placed in between the two radiating elements at a distance of 10 mm. The designed antenna elements have better than-23 dB coupling isolation between the two radiating elements. Moreover, with MNG an additional frequency of 8.2 GHz is obtained, which is useful for ITU band applications. The proposed antenna bandwidth is expanded by 19% in the lower operational band, 20% in the second operational band, and 32% in the higher frequency band with the MNG unit cell. From the analysis, the proposed antenna is suitable for WiMAX/WLAN/ITU band applications because of its low enveloped correlation coefficient, and highest directive gain and low mutual coupling between the radiating components. The proposed antenna was simulated, fabricated, and measured with the help of the Schwarz ZVL vector network analyzer and anechoic chamber. Both measured and simulated results are highly accurate and highly recommended for WiMAX/WLAN/ITU bands. © 2022 The Author(s). Published by Cambridge University Press in association with the European Microwave Association.

Author keywords

DG DGS ECC metamaterial unit cell MIMO antenna

Indexed keywords

Engineering controlled terms: Defected ground structures, Electric network analyzers, Metamaterial antennas, Microwave antennas

Engineering uncontrolled terms: DG, DGS, ECC, Isolation enhancement, Metamaterial structures, Metamaterial unit cell, MIMO-antennas, Mutual coupling, Radiating elements, Unit cells

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Section Articles

Elemental, Thermal and Physicochemical Investigation of Novel Biodiesel from Wodyetia Bifurcata and Its Properties Optimization using Artificial Neural Network (ANN)

https://doi.org/10.31603/ae.6171 (https://doi.org/10.31603/ae.6171)

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Published: 07 January 2022

Squirrel Search Algorithm Based Support Vector Machine for Congestion Control in WSN-IoT

B. Siva Sankari & Ramya Nemani

Wireless Personal Communications **124**, 1945–1960 (2022)

Abstract

As the Wireless sensor network (WSN) has huge part in Internet of Things (IoT), it is used in different applications, for example, detecting climate and sending information by means of the internet. In any case, because of the issue of weighty congestion, the performance of WSN-IoT

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Performance evaluation of a distributed energy model with compound Poisson arrivals on an improvised forked network: A detailed analysis

N Thirupathi Rao [a], Debnath Bhattacharyya [b], Sk Meeravali [c], Seng-Phil Hong [d]

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Abstract

Performance evaluation of a distributed energy model with compound poisson arrivals on an improvised forks network discusses the usage and operations on communication networks, the utilization of these network models had changed the scenario of communication around the world. Establishment and working with these networks lead to work efficiently and effectively for various modes of communications like voice transmission and data transmission. In the current network model, we had considered and developed the network model for the arrival of packets to the network model following non-homogeneous compound poisson arrivals with a uniform distribution pattern. The current model compares with the other homogeneous arrival of packets which follow the Duane process of arrival of packets to the network. When considering energy preservation, it is possible to enhance end-user performance while simultaneously decreasing energy consumption for the mean number of packets, throughput, network node utilization, and dynamic bandwidth utilization. After Implementation of the model, it is observed that energy reservation of the network nodes had increased a lot. During high traffic, our model demonstrates that its emptiness with the comparison of the homogenous model like poisson process and duan process was more efficient with a percentage increase of 16 % and 19 % respectively for a homogeneous network, mean number of packets with a rise of 10 % and 37 %, utilization of packets with 11 % and 18 %, mean delay of packets with 16 % and 5% and throughput of the network with 47 % and 38 %. The results obtained from the equation models were derived and developed with the help of the software MATLAB and MATHCAD. Comparing our heterogeneous model with the results of the homogenous network model had enormously decreased the computational time of the network. Thus, we can clearly state that our proposed model outperformed than remaining other homogenous models.

Introduction

For efficient design and analysis of communication systems, one must study the quantitative relations between system resources parameters, system workload, system performance measures, and their implications on resource allocation in a systematic manner. The most important considerations of communication networks are the development of congestion control strategies, rise in idle time of the network model, and energy reservations of the nodes in the network model. Communication network models are developed with various assumptions on arrival processes, transmission processes, allocation, routing and flow control mechanisms. For better utilization of resources and improving service quality, packet switching is used over-circuit or message switching. Another transmission strategy, dynamic bandwidth allocation, is utilized as an alternative and efficient control strategy to maintain service quality and reduce buffers' congestion.

Document details - Design of QoS aware routing protocol for iot assisted clustered wsn

Computers, Materials and Continua

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Design of QoS aware routing protocol for iot assisted clustered wsn(Article) (Open Access)

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Abstract

In current days, the domain of Internet of Things (IoT) andWireless Sensor Networks (WSN) are combined for enhancing the sensor related data transmission in the forthcoming networking applications. Clustering and routing techniques are treated as the effective methods highly used to attain reduced energy consumption and lengthen the lifetime of the WSN assisted IoT networks. In this view, this paper presents an Ensemble of Metaheuristic Optimization based QoS aware Clustering with Multihop Routing (EMOQoSCMR) Protocol for IoT assisted WSN. The proposed EMO-QoSCMR protocol aims to achieve QoS parameters such as energy, throughput, delay, and lifetime. The proposed model involves two stage processes namely clustering and routing. Firstly, the EMO-QoSCMR protocol involves crossentropy rain optimization algorithm based clustering (CEROAC) technique to select an optimal set of cluster heads (CHs) and construct clusters. Besides, oppositional chaos game optimization based routing (OCGOR) technique is employed for the optimal set of routes in the IoT assisted WSN. The proposed model derives a fitness function based on the parameters involved in the IoT nodes such as residual energy, distance to sink node, etc. The proposed EMOQoSCMR technique has resulted to an enhanced NAN of 64 nodes whereas the LEACH, PSO-ECHS, E-OEERP, and iCSHS methods have resulted in a lesser NAN of 2, 10, 42, and 51 rounds. The performance of the presented protocol has been evaluated interms of energy efficiency and network lifetime.

Author keywords

Cluster head selection | Clustering | Internet of things | Metaheuristics | QoS parameters | Routing | Wireless sensor networks

Indexed keywords

Engineering controlled terms: Clustering algorithms | Energy efficiency | Energy utilization | Internet protocols | Particle swarm optimization (PSO) | Power management (telecommunication) | Routing protocols | Sensor nodes

Engineering uncontrolled terms: Cluster-head selections | Clustering techniques | Clusterings | Metaheuristic | Metaheuristic optimization | QoS parameters | QoS-aware | Routing techniques | Routing-protocol | Routings

Engineering main heading: Internet of things

Document details - Deep learning enabled predictive model for p2p energy trading in tem

Computers, Materials and Continua

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Deep learning enabled predictive model for p2p energy trading in tem(Article) (Open Access)

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Abstract

With the incorporation of distributed energy systems in the electric grid, transactive energy market (TEM) has become popular in balancing the demand as well as supply adaptively over the grid. The classical grid can be updated to the smart grid by the integration of Information and Communication Technology (ICT) over the grids. The TEM allows the Peerto- Peer (P2P) energy trading in the grid that effectually connects the consumer and prosumer to trade energy among them. At the same time, there is a need to predict the load for effectual P2P energy trading and can be accomplished by the use of machine learning (DML) models. Though some of the short term load prediction techniques have existed in the literature, there is still essential to consider the intrinsic features, parameter optimization, etc. into account. In this aspect, this study devises new deep learning enabled short term load forecasting model for P2P energy trading (DLSTLF-P2P) in TEM. The proposed model involves the design of oppositional coyote optimization algorithm (OCOA) based feature selection technique in which the OCOA is derived by the integration of oppositional based learning (OBL) concept with COA for improved convergence rate. Moreover, deep belief networks (DBN) are employed for the prediction of load in the P2P energy trading systems. In order to additional improve the predictive performance of the DBN model, a hyperparameter optimizer is introduced using chicken swarm optimization (CSO) algorithm is applied for the optimal choice of DBN parameters to improve the predictive outcome. The simulation analysis of the proposed DLSTLF-P2P is validated using the UK Smart Meter dataset and the obtained outcomes demonstrate the superiority of the DLSTLF-P2P technique with the maximum training, testing, and validation accuracy of 90.17%, 87.39%, and 87.86%.

Author keywords

Deep learning | Distributed systems | Energy trading | Load forecasting | Peer-to-peer | Power generation

Indexed keywords

Engineering controlled terms: Balancing | Deep learning | Electric power plant loads | Electric power transmission networks | Forecasting | Peer to peer networks | Smart power grids | Statistical tests

Engineering uncontrolled terms: Deep belief networks | Deep learning | Distributed energy systems | Energy markets | Energy trading | Load forecasting | Optimization algorithms | Peer to peer | Power- generations | Predictive models

Engineering main heading: Power markets

Document details - Artificial intelligence based solar radiation predictivemodel using weather forecasts

Computers, Materials and Continua

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Artificial intelligence based solar radiation predictivemodel using weather forecasts(Article)(Open Access)

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Abstract

Solar energy has gained attention in the past two decades, since it is an effective renewable energy source that causes no harm to the environment. Solar Irradiation Prediction (SIP) is essential to plan, schedule, and manage photovoltaic power plants and grid-based power generation systems. Numerous models have been proposed for SIP in the literature while such studies demand huge volumes of weather data about the target location for a lengthy period of time. In this scenario, commonly availableArtificial Intelligence (AI) technique can be trained over past values of irradiance as well as weatherrelated parameters such as temperature, humidity, wind speed, pressure, and precipitation. Therefore, in current study, the authors aimed at developing a solar irradiance prediction model by integrating big data analytics with AI models (BDAAI- SIP) using weather forecasting data. In order to perform long-term collection of weather data, Hadoop MapReduce tool is employed. The proposed solar irradiance prediction model operates on different stages. Primarily, data preprocessing take place using various sub processes such as data conversion, missing value replacement, and data normalization. Besides, Elman Neural Network (ENN), a type of feedforward neural network is also applied for predictive analysis. It is divided into input layer, hidden layer, loadbearing layer, and output layer. To overcome the insufficiency of ENN in choosing the value of weights and hidden layer neuron count, Mayfly Optimization (MFO) algorithm is applied. In order to validate the performance of the proposed model, a series of experiments was conducted. The experimental values infer that the proposed model outperformed other methods used for comparison.

Author keywords

Artificial intelligence | Elman neural network | Mayfly optimization | Solar irradiation prediction | Weather forecast

Indexed keywords

Engineering controlled terms: Data Analytics | Data handling | Feedforward neural networks | Internet protocols | Irradiation | Photovoltaic cells | Solar energy | Solar power generation | Solar radiation | Wind

Engineering uncontrolled terms: Elman neural network | Mayfly optimization | Neural-networks | Optimisations | Prediction modelling | Renewable energy source | Solar irradiances | Solar irradiation | Solar irradiation prediction | Weather data

Engineering main heading: Weather forecasting

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An effective CuO/Bi_2WO_6 heterostructured photocatalyst: Analyzing a charge-transfer mechanism for the enhanced visible-light-driven photocatalytic degradation of tetracycline and organic pollutants

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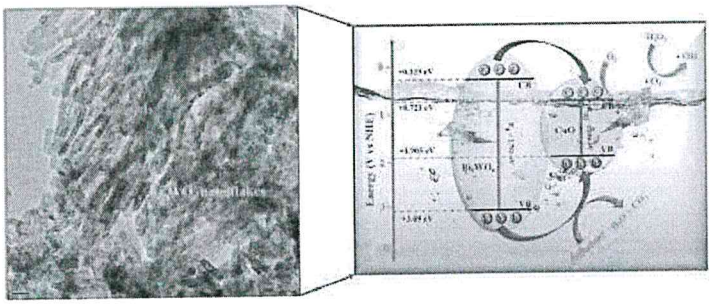
Abstract

Over the past few years, industrial pollution has had a negative impact on aquatic life by releasing significant amounts of hazardous chemicals into the ecosystem. Therefore, it is imperative to develop photocatalytic materials with good photocatalytic activity and easy separation. Photocatalytic degradation has been employed for the removal of such contaminants using binary hybrid nanocomposites as photocatalysts. In the present study, binary CuO/Bi_2WO_6 (CuBW) nanocomposites with different loadings of Bi_2WO_6 (~5, 10, and 15 mg) were successfully constructed using a simple hydrothermal method and used as a potential photocatalyst for the degradation of tetracycline (TC) and methylene blue (MB) under visible-light irradiation. The structure, surface morphology, and optical properties were studied to investigate the formation of the heterostructure. Among the prepared samples, the CuBW nanocomposite containing the optimum content of Bi_2WO_6 (~10 mg) exhibited superior activity toward the photocatalytic degradation of TC (97.72%) in 75 min and MB (99.43%) in 45 min under visible-light illumination. Radical trapping experiments suggested that holes and •OH radicals were the dominant reactive species during the photocatalytic process. The photoelectrochemical results also confirmed the improved separation and transfer of electron-hole pairs at the interface of Bi_2WO_6 and CuO. Our results demonstrate that the binary CuO/Bi_2WO_6 nanocomposite has significant potential applications in the field of photocatalysis due to its enhanced separation of the photoexcited charge carriers and strong synergistic interactions.

Graphical abstract



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Biointerface Research in Applied Chemistry
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Article
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Effect of Oxidation Temperature on Magnetron Sputtered Zirconium Niobium Films

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Abstract: Thermal treatment was performed on DC magnetron sputtered zirconium niobium ($Zr_{0.7}Nb_{0.3}$) films in the oxygen-enriched environment at different temperatures in the range 400 – 700°C to transform from $Zr_{0.7}Nb_{0.3}$ to $Zr_{0.7}Nb_{0.3}O_2$ films. The films oxidized at 700°C were of tetragonal $Zr_{0.7}Nb_{0.3}O_2$ with a crystallite size of 22 nm. There was a significant increase in the optical transmittance of the $Zr_{0.7}Nb_{0.3}O_2$ films from 75% to 90%, and eventually, the optical band gap also increased from 4.32 to 4.61 eV by increasing the oxidation temperature from 400 to 700 °C, respectively. The metal-oxide-semiconductor stacks of Al/$Zr_{0.7}Nb_{0.3}O_2$/p-Si showed higher dielectric constant values with improved interface quality at oxide/Si stack upon thermal oxidation at 700°C with relatively lower leakage currents.

Keywords: $Zr_{0.7}Nb_{0.3}O_2$ thin films;structure; FTIR; XPS;optical;dielectric constant; leakage currents.

1. Introduction

Zirconium oxide (ZrO_2) is familiarly known as zirconia. It is prominent material for device applications because of its high mechanical strength, fracture toughness, thermal insulation, high transparency, and resistance to erosion[1]. On the other hand, ZrO_2shows good thermal stability with silicon and has a high dielectric constant is considered a promising candidate for conventional very large-scale integration processing [2]. Its high refractive index, large bandgap, insignificant optical losses, and high transparency in the visible region made it useful for high reflectance mirrors, active optoelectronic devices, and broadband filters [3-5]. In recent years, much attention is focused on the doped zirconium oxide thin films for optoelectronic devices. Hydrogenated zirconium oxide is a potential candidate for application in solid-state ionic energy devices [6]. Aluminum-doped zirconium oxide leads to the tuning of the refractive index for optoelectronic applications [7]. Gold doped zirconium oxide coatings realized strong visible light absorption due to localized surface plasmon resonance for use in plasmonic devices such as lenses, switches, and waveguides [8]. Copper doped ZrO_2 nanoparticles grab attraction for photocatalytic applications [9]. Atomic layer deposited CeO_2 - ZrO_2 films are potential for solid-state oxide fuel cells [10], HfO_2 - ZrO_2 films in electrostatic supercapacitors [11], ZrO_2-TiO_2 films as corrosion resistance [12], and sensing of oxygen, hydrogen, methane, and carbon monoxide gases [13]. Doping of yttrium /calcium in zirconium

Automation of the air conditioner using ARDUINO

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ABSTRCT

An inexpensive and versatile home control and environmental monitoring system is presented in this research. The Arduino Mega 2560 microcontroller has an inbuilt micro-web server with IP connection, allowing it to access and operate gadgets and appliances from a distance. A web application or a Bluetooth Smart phone app based on Android may be used to operate these devices. For example, the suggested system does not need a dedicated server PC as in prior systems and provides a new communication protocol to manage the home environment with more than merely switching functions. Devices such as light switches, power plugs, temperature sensors, gas sensors, and motion sensors have been incorporated into the proposed home management system to show its practicality and efficacy.

Index Terms— Smart Home, Home Automation, Android Smartphone, Arduino, Light Dependent Resistor, Passive Infrared Sensor, Graphic User Interface

I. INTRODUCTION

In today's world, security systems play a significant role in protecting both people and property. With the addition of multiple security subsystems to the system, such as surveillance, intruder detection control, access control and fire detection, a single control unit may be used. Lighting, heating, and technological items that can be controlled remotely through a smartphone or the internet make a house a "smart home." Controlling your house's electrical gadgets from anywhere in the world is easy with an internet-based home automation system [1]. The capacity to remotely or automatically control many aspects of one's house is provided through home automation. For example, a refrigerator is an example of a home appliance, which is a gadget or instrument intended to do a certain task. In this context, "appliances" and "devices" are used synonymously. When it comes to the fundamental chores of turning on and off equipment and beyond, either remotely or in close proximity, automation is today's reality [2]. While automation reduces human judgement to its barest minimum, it does not eliminate it entirely. The idea of being able to control your home appliances from anywhere in the globe at any time over the internet is becoming more popular.

OVERVIEW OF THE SMART HOME

Figure 1 depicts the smart home system's basic block diagram. Sensors attached to a micro-controller are used to gather information about physical conditions [4][5]. The temperature sensor and the gas sensor, for example, provide temperature readings, while the gas sensor keeps an eye out for the

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ARTIFICIAL INTELEGENCE FOR DNA ANALYSIS TO PREDICT GENETIC DISEASES

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Abstract:

For the goal of classifying samples, gene expression analysis is used to determine the relative relevance of each gene. There have been a number of important findings and advancements in clinical care based on microarray data relating to gene expression profiles. Microarray data often have a limited sample size and a high dimension. Using an all-purpose categorization system would be problematic in this situation. There are some genes, however, that may not be useful in identifying the type of sample. A good feature (gene) selection strategy and an efficient gene extraction method are both required for accurate analysis of gene expression profiles in order to reduce the classification error rate. The AI and the correlation-based feature selection (CFS) were integrated in this paper into a hybrid technique. It was used as a classifier for ten gene expression profiles that were analyzed using AI with LOOCV (leave-one-out cross-validation).

Keywords: DNA, genetic diseases, AI, Microarray data.

I. Introduction

In recent years, the epidemic in breast cancer, diabetes, liver disorder, prostate cancer, colon tumor, obesity and many other heart diseases has become a challenge to global health. The dreadful diseases like cancer often proves to be life-altering, life threatening and fatal. Most often their symptoms stem from a genetic basis and a host of challenges demand for the prevention, diagnosis, treatment and cure of these diseases. As medicine plays a great role in saving human life, medical data classification has remained as one of the leading research areas in the domain of biomedical informatics, machine learning and pattern classification. Medical data classification as one of the key areas of datamining tasks. Medical data is often found to be heterogeneous,

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HUMANOID VISION ROBOT FOR DELIVERING THE INFORMATION

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Abstract: Technology makes life easier " Here comes another technology to assist humans . Yes , It is a human assistance robot . Even though technology is developed a lot , we are still sending humans to accomplish some basic tasks like sending circulars to each class and also surveying all the classrooms is not an easy task for a single person . So we came up with a solution to send a Human Assistance Robot to complete our task . Here comes another technology to assist humans. It is a human assistance robot. We aim to make a robot that performs the following task : Our robot takes surveys of the classroom by taking pictures of the classroom in 3 different directions and it will upload the photographs to the cloud. After completion it will send an acknowledgement to the administrator. So without power we cannot operate any electronic device . Designing of a power module for the human assistant robot.

Keywords: Raspberry Pi 3,. Arduino Mega,GUI Interface, Bluetooth module, L239D Motor Driver, LCD Display, UltraSonic sensor.

I. Introduction

The field of humanoids AI, widely known because the current challenge for AI analysis, is attracting the interest of the many analysis teams worldwide. vital efforts are dedicated to the target of developing humanoids and spectacular results are created. mechanism any mechanically operated machine that replaces human effort, tho' it's going to not correspond with folks during appearance or perform functions in a human manner. By extension, AI is the engineering discipline managing the planning, construction, and operation of robots. Developing humanoids poses fascinating issues within the realization of manipulation capability, that remains one of the foremost complicated issues in AI. For its scientific content and for its utility in most AI applications, the matter of manipulation has been deeply investigated and plenty of results

Aqua Farm Theft Control System using IoT and Telegram

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Abstract- The device's objective is to protect fishermen's gear. Raspberry Pi processors are used as both the station and the controller for the warehouse's intrusion detection system (IDS). This involves the use of face recognition technologies and telegraph alerts. A USB cord connects the PIR sensor, camera processing, and buzzer processing to the Raspberry Pi. The notification system communicates with bots using Telegram's API. When a person is recognised, the camera records a video and saves it to the SD card. This is compared using the database's information. It sends a video to the owner's telegram account as a notification/alert to the owner that there is an intruder in the Aqua Farm, and a buzzer is used as an alarm to notify the nearby residents when the unknown intruder is noticed on camera. pond ecosystems employ the planned project for fishing activities..

Keywords- Alert, Face recognition, Intrusion Detection System (IDS), Raspberry pi, Telegram.

I. INTRODUCTION

The thefts at the aquafarm have become a major source of worry in modern times. There are now a few surveillance options on the market, but they have various limitations, including high costs, low transmission distances, reliance on PCs, and a high need for storage space [1] [2]. To address the shortcomings of current monitoring systems, this research proposes an intrusion detection system that is both frugal and energy efficient and is cheap to aquaculture [3]. Some of the components of the Intrusion Detection System that ensure security include facial recognition, telegram alerting, and motion detection [4]. One of the most appropriate approaches for assisting aquafarm owners in remotely monitoring the aquafarms is to utilise IoT (Internet of Things) [5].

The PIR sensor is utilised in Aqua Farm to detect intruder movements. It activates the camera, and footage of the invader begins to be taken. If the data of the person entering the farm (owner or worker) is available in the database, no alarm is issued to the owner by telegram; otherwise, the owner is notified and locals are warned through a buzzer. Telegram is used for notifications instead of other apps because it allows you to share many photos and videos (up to 1.5 GB) and has more security, speed, and no advertising or additional premium content. It has no subscription fees, and it is easily accessible on Android and iOS devices, whereas others, such as G-Mail and Twitter, are very time-consuming to use [6]. The major goal of this article is to build and deploy a cost-effective and secure aqua theft monitoring system.

The literature review has also been completed. The suggested item is IoT and telegram-based theft control system for aqua farmers has the benefit of notifying not just one but a large number of people when they are joined to the group. Because the face recognition system utilised is dynamic and can be trained to learn new faces instantly, it addresses some of the issues identified in previous research. This technology is so adaptable and user-friendly that even inexperienced users can use it. It employs a motion sensor and only activates when motion is sensed, using less electricity and promoting its widespread use. This system was designed with aqua farmers in mind, but its adaptability allows it to be applied to a broad range of applications based on facial recognition and alerting systems. Introduction, methodology, results & discussion, and conclusion are the four sections of the study.

STACKED PATCH ANTENNA FOR SUB 6GHZ APPLICATIONS WITH DGS

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ABSTRACT
In this paper, a dual layer Stacked Patch Antenna is presented for sub 6GHz applications. This antenna is resonating at a frequency of 3.9 GHZ having a 6dB impedance bandwidth from 3.5 GHz to 4.2 GHz (700 MHz) with VSWR < 2, suitable for 5G sub 6 GHz Applications. Usage of 5G Technology is extremely increased because of high data rates.This is designed and simulated using CST microwave studio 2018.ThisStack Antenna offers a wide range of bandwidth from 3.5 GHz to 4.2 GHz(700 MHz)and it is adopted with DGS technique to improve various parameters like Gain, Bandwidth and radiation characteristics. This dual layer stacked antenna designed with two identical substrates which are stacked one on another with dielectric Rogers RT5880 (lossy)and a copper (annealed) feed line with aperture coupling is provided for impedance matching. A H-shape patch is constructed in front end and DGS is constructed on back end of antenna to obtain the desired characteristics. By considering the overall results, this stacked patch antenna is proposed for 5G applications with a peak gain of 4.88dB at 3.5 GHz and 5.98 dB at 3.7GHz with a return loss of -16 dB at 3.9GHz which is suitable for n77,n78 sub 6 GHz bands in 5G applications.

Keywords: Stack Antenna, Defected Ground Structure(DGS), Bandwidth, sub 6GHz bands

I. INTRODUCTION
Humans are being updated day by day with latest technology and making their life more comfortable with technology. In which wireless communications has prominent role, wireless technology can't be possible without Antenna [1]. Micro-strip Antenna is now the most widely used type of antenna in the world. The low profile and low cost in circuit board 5g wireless communication antenna array that increases gain and it is simple to fabricate [2]. A H-Shaped patch antenna is designed using U-slot loaded with patch and provided various parameters like slot length, width along with substrate thickness to improve antenna characteristics [3]. Stacked patch has capability to provide dual frequency characteristics [5]. The fundamental properties of an antenna are Gain, Impedance [4,6-10].

In this research work, double layer stacked patch antenna with a thickness of 1.6 mm of RT5880 substrate is used to get the high gain suitable for n77, n78 sub 6 GHz bands in 5G applications using aperture type of coupling, due to which gain has enhanced. H-Shaped slot on the radiating patch as well as DGS on back end is proposed to radiate the antenna at a frequency of 3.9 GHz with a 6dB operating bandwidth from 3.5 GHz to 4.2 GHz with return loss of -16dB.In this paper, Section I has usage of Antenna for 5G Technology. Section II has Technical design of an Antenna. Section III has Antenna performance parameters

II. Technical design
Area of work : Antenna
Type of Antenna : Micro strip Stack Patch Antenna
Tools Used (Software Used) : CST
Substrate : RT5880 (Lossy)
Thickness : 1.6mm

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Ship to shore communication using GPS and GSM.

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ABSTRACT-Trying to identify the location of fisherman has been challenging for the emergency responders, owners and family members from traditional times to recent times. Fishermen have perished in recent times as a result of abrupt changes in the atmosphere and a lack of effective communication. To save the most valuable human life,a system was developed based on research work with current models. The Arduino Uno, GPS module, and GSM SIM800L are the main components of the proposed model. It uses the GSM module to continuously track the location's latitudes and longitudinal co-ordinates. With the help of the DTH 11 sensor, it also displays temperature and humidity on the LCD screen to indicate climatic conditions. After pushing the button, an emergency message, temperature, and humidity will be instantly sent to the owners and the rescue team.

Keywords: Fisherman, Arduino uno, GPS and GSM module, LCD display, button

I. INTRODUCTION

The number of boating accidents has increased, and many people have died as a result of not receiving necessary assistance in a quick response. we deal with this problem by inspecting the boat circumstances and continuously track the boat's area During any abnormal condition is discovered in the boat then the device sends the instructions to the concerned party through text[1]. The main goal of this document is to follow the boat's location and notify salvage groups and victims if it is in grave danger or in a life-threatening condition. The Arduino Uno, GPS receiver, and GSM SIM 900A module are utilized as key hardware in this article, and the hardware description language is built using the fundamental C programming language. First, the Arduino programmable microcontroller board is used to upload the sketch[2]. The GPS antenna in the GPS module receives information from the GPS satellite, which reveals the position information of latitude and longitude coordinates [3]. The GPS antenna sends the data to the Arduino, which is connected to it. Then, the Arduino sends its data to the GSM module, which connects to the SIM card number specified by the user [4]. In these cases, one can receive a short message from the designated Android mobile phone indicating the place where ship is located. If the ship sinks into the sea or if an emergency occurs, GSM sends the GPS location coordinates to the appropriate rescue team [5]. The Arduino microcontroller is in charge of operating and communicating with the GPS module and GSM receiver. Arduino can sense the surroundings by gathering and showing data from a variety of sensors. The Serial Monitor is included in the Arduino IDE. Its job is to allow messages to be sent from a computer to an Arduino board (through USB) as well as messages to be received from the Arduino [6].

II. METHODOLOGY

Many academics have pushed for the deployment of cutting-edge technology to achieve the objective of location tracking. They discussed GSM, GPS modules, server systems, and other technologies[7]. For this system, Arduino uno is utilised to build a ship to shore communication device, which require hardware implementation. In the hardware implementation of this project, the Arduino uno, GPS module, GSM SIM800L module, DTH11 sensor, button, LCD, and buzzer are all used. When a button pressed, latitude and longitude coordinates of fisherman tracked by the GPS system will be sent to the owner by GSM module along with temperature and humidity which are displayed on the LCD and at the same time Buzzer will be used alert the near by boats[8] as shown In figure1.

Soil and Plant Monitoring System using IoT

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Abstract

Gardening plants involves a lot of manual effort like watering plants based on moisture levels of the soil. Automation in Gardening is hardly seen in India which is a drawback. This device's objective is to ensure facile in maintaining gardens. NodeMCU allows connection of different devices and sharing data between them through a Wi-Fi protocol. This device uses IoT platform in recognising the field conditions and sending the telegraphic alerts. When the soil moisture content is decreased, the owner gets a notification to water the plants in a mobile app. He just needs to turn on the press the button in the app which turns on the solenoidal valve connected to the over head tank. Socio-ecological systems implement this device for gardening in their balconies or on their roof tops.

Keywords - Garden, NodeMCU, Wi-Fi protocol, Mobile app.

I. Introduction

Farming and Gardening are widely seen practices in India. Agriculture is one of the major sectors in India [1]. But for most of the part, there is no automation involved in agriculture or gardening in India. A lot of manual effort is involved [2]. To change this, IoT can be used to automate few tasks in Gardening. One of such few tasks is watering the plants based on the moisture levels present in the soil. By automating few tasks like this, we can improve the efficiency of farming activity in fields and gardens which leads to less manual work and ultimately leading to better productivity of crops and plants.

IoT (Internet of things) can help in examining the moisture content of soil [3]. A network of sensors has been installed to collect the real time data at various environmental situations. The microcontroller collects data through its sensors and checks for various given conditions. The system can water the plants, monitor temperate and humidity, detect rains, etc. and it will send notifications to the user on an app. The data is also transmitted wirelessly to a web portal, Thingspeak [4] to understand the conditions of surrounding environment.

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Development of Web Applications by Integrating Frontend and Backend Tools

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Abstract- The web is a resource that is widely and steadily usable across many platforms. In this paper, the advanced features of components required for students to develop basic web applications and web services are discussed. Mainly frontend and backend development using HTML, CSS, JS, MySQL, PHP, and Bootstrap are prioritized. Integration of both frontend and backend development can be described as full stack development. Also, some vendors have created proprietary technologies that offer more features than web standards, such as the ability to create sophisticated online applications.

Index Terms- Back-end Development, Front-end Development, Full-stack Development, HTML, CSS.

1. INTRODUCTION

Everything that goes into making a website is referred to as web development. In contrast to this web design, it is referred to as the coding and programming side of website development. It can range from a simple HTML text page to large, rich-featured applications that can be accessed from a large variety of internet-connected devices [1]-[5].

In general, web-based applications differentiate from other traditional applications in many ways considering different parameters[6]. The parameters include reliability, scalability, security, compatibility, maintenance, performance, etc.

The proper integration and application of tools with enough knowledge is highly important for the successful creation of a web page and further the web design. In this paper, the significance and application of tools, be it front-end or back-end are well described.

The front-end tools include HTML, CSS, and JS while the back-end tools include MySQL and PHP. The basic, as well as intermediate level of a web design, can be designed using the above-mentioned tools. whereas the advanced level requires additional knowledge of the latest technologies.

The front-end tools are in charge of what one can see and interact with the web page.[8] Tools like MySQL and PHP are used for back-end development. MySQL saves information (database) and uses PHP functions to submit SQL queries to the database. PHP is the commander here.[15]

HTML is the base of all data provided to a web browser, be it static HTML or dynamically generated HTML content via a CMS (Content Management System). The code is written in HTML with which one can create a web page and a web design with one's requirements whether to have buttons, tables, text boxes, images, etc. This kind of work can be handled using HTML.

CSS (Cascading Style Sheets) is a DDL (Declarative Descriptive Language) which

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IOT BASED TIMESHEET USING GOOGLE SHEETS

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Abstract-The Internet of Things is simply a plan of action that connects embedded objects to the internet in order for them to gather and allowance of data with one another. It enables devices to talk with, engage with, and learn from one another in the same manner that humans do. IoT used in all kinds of sectors like Manufacturing Industry, Agriculture Industry, Healthcare, and, Home Automation are just a few of the domains where IoT has shown to be cost-efficient and systematic in addressing fundamental problems and weaknesses. Based on the IoT model, an instance of a RFID based Smart Attendance System is developed to address the problems associated with manual attendance systems in educational institutes and companies by performing automated attendance track record generation, reporting, monitoring, and alert generation for various educational institute stakeholders. The attendance gadget is built portable so that it may be readily cycled among students to record their attendance, reducing the overall time necessary to take attendance in the class. The system has been put to the test, and the findings point to more research and study in this field.

Keywords: IoT (Internet of Things), Cloud Computing, RFID (Radio Frequency Identification), Node MCU

I. INTRODUCTION

A. Internet of Things

The internet of things (IoT) refers to ordinary objects that link to the internet, allowing us to control or receive data from them via our smartphones or computer. IoT not only helps us work smarter, live smarter, and achieve total control over our lives, but it also contributes to our overall well-being. Whatever smart IoT application you choose, you'll agree that the knowledge and convenience you get as a consequence have saved you time, money, and a lot of stress. The Internet of Things has seen steady expansion and interest as the price of computer gadgets, sensors, and the internet has decreased. At its foundation, the Internet of Things aims to solve real-world issues by providing sensing, processing, and networking capabilities to objects that would otherwise lack these capabilities. An object becomes an IoT device when these characteristics are added, allowing it to communicate with exterior devices and transfer data to the external

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FLASH PAY PAYMENT APPLICATION FOR MOBILE DEVICES

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Abstract — This paper describes the development of web and mobile applications and a sample design of a payment application called FlashPay. This application is developed using various front-end and back-end tools such as HTML, CSS, JS, Angular, Node.js and SQL. It also includes about the cross platforms on which Android, IOS and Web applications can be developed. An application is a type of software that can be installed and run on a tablet, mobile phone, computer and other devices. The general public has begun the transition from traditional payment systems to digital payment systems that provide security and convenience. In this application, number of services are available, so the user can easily select the services and benefit from them. FlashPay is an android application that allows you to pay invoices and recharge your mobile phone. This paper will introduce you to the detailed design of this application.

Keywords: Front-end, back-end, angular, HTML, CSS, JS, node.js, SQL.

I INTRODUCTION

In today's digital age, internet use has skyrocketed. Customers are increasingly adopting digital options that might save them time when it comes to banking. Digital payment solutions are often simpler, more convenient, and enable clients to make purchases from anywhere. Application development is the process of making mobile apps that can run on any mobile platform, like Android and iOS. The "front end" of an application comprises all the elements and information that a user interacts with, such as drop-down menus, sliders, navigation bars, and lists. Front-end builders are similar to interior designers in that they construct the overall ambiance, appearance, and feel of a space so that from the moment a person enters, everything is in its proper place [1].

Back-end development is also called "development on the server side." It's everything that customers don't see, like what goes on behind the scenes when something moves on a website. The back-end of an online site could be a group of servers, applications, and databases. The code written by back-end builders lets browsers talk to databases and store statistics in them [2].

According to Sanghita Roy and Dr. Indrajit Sinha (2014), the Indian e-payment system has evolved significantly, but much more has to be done to promote its utilization. Nonetheless, cash is used in 90% of transactions. For the purposes of the research, the technology acceptance model was applied. They observed that four variables contribute to the system's strengthening: innovation, incentives, consumer convenience, and the legal framework. The relevance of mobile payment and the usage of the Internet/WAP as a payment system was explored by Liébana-Cabanillas [3].

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Prick Free Glucometer

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***Abstract*—Diabetic people must have their blood glucose levels checked regularly. Common glucometers work by puncturing the finger, which can lead to skin infections and discomfort. As a result, there is a need to build a low-cost non-invasive glucometer that can constantly monitor blood glucose without causing issues, therefore near-infrared optical measurement is used to address the problems that happened during the invasive approach. The gadget is made up of an infrared LED with a wavelength range of 750 to 2500 nm in the electromagnetic spectrum, which allows light to penetrate the skin beyond 0.5mm with low-intensity radiation. The presence of glucose molecules in the blood boosts NIR light absorption, which peaks at a certain wavelength.An application is developed to display the glucose levels.The BEER LAMBERT LAW is utilized mathematically to solve the problem.**

***Index Terms*—Diabetes, Noninvasive, Intensity, Regression and Beer Lambert law, MIT App Inventor.**

I. Introduction

Diabetes is a condition in which your blood glucose, often known as blood sugar, is too high. Your major source of energy is blood glucose, which comes from the food you eat. Insulin, a hormone produced by the pancreas, aids glucose absorption into cells for use as energy. Type 1 diabetes needs daily insulin injections to stay alive. Type 2 diabetes necessitates daily insulin injections in order to stay alive. People with Type 2 diabetes have a body that does not produce or utilize insulin properly. Type 2 diabetes may strike anyone at any age, even children. Type 2 diabetes is the most common. Some women acquire gestational diabetes during pregnancy. Currently, millions of individuals are affected by diabetes. Many people are also unaware that they have diabetes. One in four adults over the age of 65 has diabetes. Type 2 diabetes is the most common type of diabetes in adults, accounting for 90-95 percent of cases.

High blood glucose levels can contribute to a variety of issues over time, including illness of the heart stroke renal failure difficulties with the eyes illness of the teeth injury to the nerves difficulties with the feet People use a variety of pills to treat diabetes. However the majority of these medications cause negative effects. As a result, diabetes is a chronic illness that needs frequent blood glucose testing to maintain a normal blood glucose level. A glucometer is a gadget that is used to test glucose in the blood and is available on the market. The most popular and traditional glucometers need pricking to get a drop of blood, which is then used to test glucose levels. As a diabetic, you must monitor your blood glucose levels on a regular basis. However, there are several disadvantages to utilizing an intrusive glucometer. It is really painful. It may result in non-compliance. It poses a risk of infection. It may affect your skin. Possibilities of cross-infection NON-INVASIVE GLUCOMETER are being developed to prevent these issues.

The non-invasive glucometer in this case provides glucose readings without the need for a finger puncture. As a result, we created a non-invasive glucometer that uses a NIR led. This approach is quite easy and produces reliable readings. The NIR approach is utilized here because the NIR LEDs penetrate deeper into the skin and use regression analysis to calibrate the glucose levels in the body. The glucose levels are obtained by performing a regression analysis between the output of the IR sensor and the respective glucose levels using a near-infrared LED sensor with a wavelength of 940 nm. The IR rays penetrate the blood and the glucose levels are obtained by performing a regression analysis between the output of the IR sensor and the respective glucose levels. By using ESP32 , an interface is created to view the glucose levels on an application. As a result, this procedure does not need any finger puncturing and is simple to implement.

II. Block Diagram

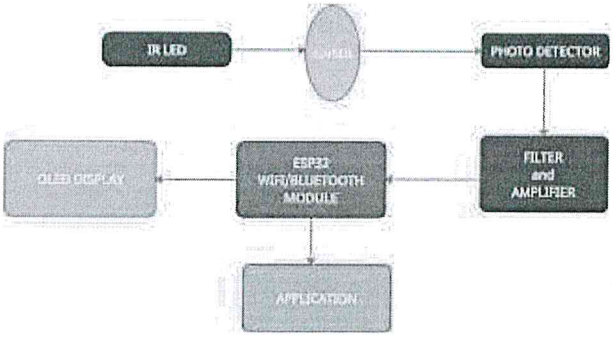

Fig. 1. Block Diagram

The Block Diagram of the non invasive glucometer consists of an IR led , photo detector, a low pass filter, amplifier, esp32, application and OLED display.The IR LED transmits IR signals into the skin.The photo detector detects the absorbed IR signal.The low pass filter removes the noise present in the

A CPW-Fed Rectangular MIMO Antenna

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Abstract:

This paperwork contains multiple input and multiple output (MIMO) antenna which uses Co-planar Waveguide (CPW) feeding system, for the frequencies of 2.5/5 GHz. Multiple-input multiple-output means placing multiple antenna elements to improve the efficiency and capacity and used in communications. . And it has higher data rate and multipath propagation. The proposed design of antenna contains elements which are identical and placed parallel to each other. The antenna is printed on the FR4(flame resistant 4) substrate, which is cost-effective dielectric substrate. The antenna has good impedance matching. The antenna design in this paper has envelop correlation coefficient (ECC) which is less than 0.001 and Diversity gain is greater than 9.99dB. The proposed antenna is used for MIMO applications due to high diversity value, low ECC, low reflection coefficient, and the components have low mutual coupling.

Keywords: ECC, DG, MIMO, CPW

1. Introduction

Nowadays, wireless communication networks usage is rapidly increasing, so for efficient communication we are going for MIMO antennas. MIMO has many advantages includes multipath fading, capacity of channel, high transmission rate when compared to single antenna design. The channel capacity increases by using multiple antennas at transmitter and receiver and high Signal to Noise ratio (SNR) to achieve good communication. In year 2002, the FCC authorized the use of 3.1-10.6 GHz frequencies for Ultrawide Band applications [1]. The antennas are combined to reduce the errors, optimize speed of data by sending data to travel through many paths at same time. MIMO creates more stable connection and less congestion. For increasing antenna efficiency, meta-material approaches are published. Meta-material is unique structure with distinct electromagnetic properties, used in super lens modelling [2].

Antenna is designed on CPW fed because it has wide bandwidth and also it has minimum loss compared to micro-strip antennas [3]. Compared with conventional micro strip lines, coplanar waveguide has advantage of easier fabrication and flexibility. MIMO antennas will continuously upgrades and expand its usage in massive applications, as in future the wireless industry accommodates more antennas, devices, and networks. It has more coverage, high network capacities. There are many MIMO systems with different techniques, includes our proposed design. In [4] which is similar to our proposed MIMO antenna, the elements of antenna are placed parallel to one another. There are other techniques like EBG structure, DGS structure and using of Meta-material structure to minimize the mutual coupling between the antenna elements.

DESIGN AND ANALYSIS OF STACKED MICROSTRIPPATCH ANTENNA FOR WLAN APPLICATION

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ABSTRACT:
In this paper, a stacked microstrip patch antenna is designed for WLAN applications. The proposed antenna resonates at 5.2GHz with a low return loss of -35dB. The proposed stack offers wide bandwidth from 4.9GHz to 5.3GHz. The other important parameters like VSWR are less than 2 and gain is 6 dB The performance, such as gain, bandwidth, VSWR, and return loss, has been improved by positioning two identical dielectric FR-4 substrates, one on top of another. The feed is provided using proximity coupling for good impedance matching. The simulation results were obtained using CSTMW 2018 software. As a result, the proposed stack antenna is suitable for WLAN applications.

Keywords: Stacked patch antenna, WLAN, gain, bandwidth, VSWR and return loss.

I. INTRODUCTION:

The demand for wireless communication services is at an all-time high in today's materialistic atmosphere. As the demand for high data transmission rates develops, an antenna is needed with the ability to work over a wideband and broad beam range. The researchers are having difficulty in constructing an antenna that meets all of the requirements, such as small height and width, simple shape, large bandwidth, broad beam-width, tightly packed and tiny size, in wireless data communication systems. Microstrip patch antennas (MPAs) have been the best alternative for achieving all of the parameters listed above [1]. The tremendous growth of wireless communications has an impact on demand for microstrip patch antennas, which have superiority over small height and width, simple shape, feather weight, unadorned and cost-effective manufacturing using the latest printed circuit technology, ease of integration with feed networks, and so on. Microstrip patch antennas are used in high- performance spacecraft, mobile radio, and wireless communications [2]. Microstrip patch antennas, on the other hand, suffer from a variety of operational faults, including low throughput, inadequate power, lack of polarisation purity, factitious feed radiation, poor output gain, and a narrow frequency spectrum. The problems of the microstrip patch antenna have been solved in a variety of ways. Using a low dielectric substrate, implementing different impedance matching and feeding procedures, increasing substrate thickness, using multiple resonators, and stacking are some of these methods.

The antenna for WLAN applications has been investigated in several studies. There is a linear relationship between impedance bandwidth and antenna volume in microstrip patch antennas [3]. Using two multi-layered patches, higher impedance bandwidth can be achieved [4]. In WLAN applications, the layered structure is used to increase bandwidth [4–9]. A two-substrate stacked patch antenna with proximity coupling for the feed is suggested.

This paper is categorized into four sections: Section I gives a brief overview of microstrip antennas and their shortcomings. The antenna design is covered in Section II. Section III presents the simulation and findings. In Section IV, the paper was completed.

An IOT Gait analysis framework for the pattern recognition of heart disease using RFO algorithm

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ABSTRACT Heart disease is characterized by constricted or clogged blood arteries, which may lead to a heart attack, angina pain from decreased blood flow to the heart, or stroke. There is a need to create awareness among people due to the increased rate of heart stroke among children/adolescents and it is necessary to install a system that will allow the patient to monitor the signs of a heart attack at any instant of time. In forecasting the possibility of cardiovascular illnesses, there is a need of monitoring the necessary symptoms such as age, gender, pulse, etc., Artificial intelligence (AI) is the most accurate and efficient algorithm well suited for the prediction system. There are three stages for predicting heart disease. The first stage is the feature selection method to choose the characteristics that contribute the most to predict variables or outcomes. The second step will be processed using the XGBoost Machine learning (ML) technique towards gait analysis. The third stage is interface design where the user will interact with the system. The information entered by a patient will be processed by an ML algorithm that will predetermine the health status of the patient with heart disease.

Keywords: IoT, Gait analysis, Artificial Intelligence, Machine Learning, Blood pressure, Wireless body area networks, heart rate, Advanced feature reduction, confusion matrix.

I. INTRODUCTION

The terms "heart disease" and "cardiovascular disease" are often used interchangeably. The term "heart disease" is used to describe a variety of diseases that affect the heart blood veins that are constricted or obstructed may cause a heart attack or chest discomfort owing to decreased blood flow. There might be other kinds of cardiac conditions, such as coronary artery disease, Angina (abnormal blood flow to the heart) or even a stroke. The impact of heart muscles, valves, or rhythm in which the heart beats are sometimes believed to be a kind of cardiac illness. Symptoms of heart disease are determined by the kind of heart condition the patient. Men and women may have various types of heart disease. Men are affected more by cardiac disease than women due to chest discomfort, shortness of breath, nausea, and severe tiredness are more likely symptoms of chest pain. If the blood is clotted, the patient may experience discomfort, numbness, weakness, or coldness in their legs or arms. Those regions of the body have constricted vasculature [1]. Other signs and symptoms include neck discomfort, headaches, and dizziness. The mouth, neck, upper belly, back, and many other areas are also affected. Heart disorders are the result of irregular heartbeats, arrhythmias in the heart, heart abnormalities, and weak heart muscles (dilated cardiomyopathy), infections of the heart, and valvular heart disease. Many types of cardiac disease may be avoided

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AUTOMATIC SEEDING AND WATERING ROBOT

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Abstract:

This paper endeavors to evolve a robot capable of performing automatic seed sowing there have been a lot of advanced techniques got included in agricultural sectors; in that automation is one of the genres and this concept is the next level of revolution that will affect this century. Current work focuses on developing Automatic Seed Sowing Robot (ASSR). This helps to reduce human power. Consideration of specific rows and columns distance between two seeds will be entered manually. IR sensors are used to find whether the seed container is empty or not. The ultrasonic sensor is used to detect the obstacle. As this is an electromechanical vehicle DC motors are used to drive wheels. Programming of Arduino is done in assembly language.

Keywords: Arduino UNO, GSM module, Ultrasonic sensor, Motor driver, Bluetooth device.

Introduction:

Agriculture is the backbone of India [1]. For the growth of the country, agriculture plays the dominant role. For developing economic activity for India, it is important to increase the productivity in the agricultural sector. Seeding is a crucial activity for a farmer. Seed plantation is the most important task for the farmers [2]. To make ease seeding automatic seed sowing robot has been developed. To reduce the number of workers these robots can be used in real world [9]. It is capable of performing operations like seed dispensing and water distribution. This device can be in charge by providing input by android application [7]. This also reduces the wastage which happens in manual planting [8].

The manual seed sowing method has different types of problems as those based on human power and conventional old techniques. Humans cannot work in an uncertain environment and they need more time and effort. Automatic seed sowing project reduces time and human efforts. The project aims to increase the productivity and efficiency of agriculture. This project uses Arduino technology. By using the ultrasonic sensor path of the robot will be changed. Gear motors are fixed at the right and left sides of the wheels to drive the robot. IR sensor is used for the indication of seeds and water. The distance between the seeding will be depending upon the type of crop. The robot developed in this paper will perform seeding and watering for the entire crop. These are all controlled by the Bluetooth system present in the android device. For less distance, only Bluetooth will work. If the user is far more than the range of the Bluetooth then the indication alert will be sent to the mobile number directly by the use of the GSM Module.

The major objectives of this paper are [4]:

- To empower the farmer to cultivate huge areas of land within less amount of time.
- To execute automatic watering and seeding by using this machine.
- To issue manual control as a consequence of Bluetooth devices.

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Prediction of Cardiac Disease using Supervised Machine Learning Algorithms

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Abstract — Millions of people throughout the world are a part of the healthcare industry, which generates a vast amount of data. The multidimensional medical datasets are being dissected by machine learning-based models, which are providing new insights. Several cutting-edge Supervised Machine Learning algorithms are employed in this study to accurately classify a cardiovascular dataset in order to provide illness predictions. According to the results, the Decision Tree classification model predicted cardiovascular illness better than other models, such as Naive Bayes and Logistic Regression. Accuracy of 73% was achieved by using the Decision Tree. Doctors may find this method useful in predicting the onset of cardiac disease and delivering timely therapy.

Keywords — Cardiovascular Disease, Naive Bayes, Decision Tree, Logistic Regression, Random Forest, SVM, KNN, Risk prediction

I. INTRODUCTION

Heart disease (CVD) is the leading cause of death in the world, according to the World Health Organization (WHO). More than 17 million people die each year from cardiovascular disease (CVD), which accounts for about a third of all fatalities worldwide. A substance called plague, which clogs up the arteries and veins that convey blood to and from the heart, is the primary cause of cardiovascular disease (CVD). Blood flow is impeded and blocked, which can lead to heart attacks and strokes. High blood pressure, poor nutrition, inactivity, high blood cholesterol levels, alcohol consumption, cigarette use, obesity, and genetic abnormalities are all risk factors for cardiovascular disease. These deaths can be prevented if early prognostication is made. The Internet of Things, on the other hand, is constantly improving the ways in which data is collected. There are gigabytes of data coming from healthcare businesses every day as a result of these improvements. Humans are unable to sift through the millions of pieces of information that are available to determine a patient's specific medical condition. As a result, Machine Learning can be used as a predictive tool to identify patterns in data.

Factors are analysed and used to determine who is most at risk of getting heart disease using the application of Machine Learning. Methods for machine learning can evaluate enormous amounts of data and detect trends that may not be visible to humans. As the volume of data processed grows, it is often more efficient and accurate. There's also no need for human assistance, which is a huge benefit. Using labelled data and output patterns, the system learns how to do a task under the guidance of supervised machine learning. Algorithms hunt for patterns in the data that correlate with desired outputs during their training. The supervised

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Fingerprint Recognition Access Microcontroller-Based Doors

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ABSTRACT:

Fingerprints are one of the few things that are absolutely unique to each person. It is possible to reduce the risk of trespassing into homes, shops, offices, and other locations by employing fingerprints as a key to door locks. Because an unauthorized visitor may be warned by SMS if the lock is unlocked by someone who is not authorized to be there, the Arduino and GSM slots provide an additional degree of security
Keywords: Arduino, Lock, Fingerprint and GSM

1. INTRODUCTION:

Arduino was built to address the security issue. Traditional locks may be used as a security precaution. The use of patterns in locksets to reinforce security is a possibility. If passwords or other security methods are compromised, they may be accessed. Patterns may be seen. In this project, create a biometric system. A variety of additional elements will enhance the lock's security.

2. LITERATURE REVIEW

A residential security system the role of the door locks is to lock and unlock the system. For these individuals, the lock may be opened using a fingerprint, RFID card, pin, password, or IoT. These are the individuals who use their mobile phones to get access to the system. In the current state of things, both hacking and unlocking are conceivable.
When working in remote areas, security is a key problem. Personal recognition is required to get access to one's own personal information. Passwords and ID cards are the most commonly used forms of security. Due to the danger of losing cards, these approaches are not recommended. Fingerprints have been conceived and deployed to their greatest potential.

3.SYSTEM OVERVIEW:

Biometric door access control units are network-connected devices that measure a person's unique physiological characteristics. They do not save a photograph of the fingerprint or face. For security and privacy, everything is encoded. These IP door reader controllers can all be powered by PoE (via a splitter) or 12 VDC.IEW

TICKET GENERATION USING SMART CARD

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Abstract: In our country, there is by and a large presence of difficult issues concerning transport associated with the guide getting to passengers with a paper ticketing system, security, COVID move through the trade of cash, defilement, insufficient change, and wild masses. These all can't be dispensed with right away yet can be diminished somewhat by utilizing RFID smart cards. Smart cards are secure, versatile capacity gadgets utilized in security and related frameworks. This paper manages the traveler access control, ticket generation, and security utilizing IoT, RFID, and GSM.
Key Words: **IoT, RFID RC522 Module, RFID Tags, Arduino UNO, GSM Module, LCD**

1. Introduction

These days the public vehicle framework should be shrewd with quick evolving what's more, edge-cutting innovation. In any case, public vehicles in India have forever been a space where such new advances have not turned their interest. Traveler accommodation should be improved as there is weighty interest for savvy framework on the lookout. In the current framework, there are numerous not kidding issues where one needs to trust that the guide will give access utilizing a printed a ticket which prompts outright deforestation, trade of cash that raised later Coronavirus cases, wild masses that hang to the vehicle entryways, inadequate change, and less security to hand cash. Smart ticket assortment is now being utilized all over the planet. So India needs to step up with executing the smart tagging framework. This venture is completely executed utilizing IoT. By utilizing this we can lessen the utilization of paper, the spread of COVID, and give security to the traveler's cash. This project portrays the zest and excellence of utilizing IoT, a staggering innovation that is utilized to produce tickets consequently with next to no manual work or individual trade of cash. The travelers can be backed out of the strain of purchasing the tickets in a rush which can lead to various mishaps. This undertaking likewise demonstrates the way that main an approved individual can board the transport. This paper shows how RFID smart cards are utilized to produce the transport ticket, and confirm the traveler, prompting a compelling advance towards security and getting the travelers to board the public vehicle with practically no issues. Each traveler should convey an enrolled RFID card which will be examined in the individual transport vehicle for their picked destinations. Whenever the traveler picks their destination, the particular sum will be charged from the card. All the interaction and handling expenses will be displayed on the LCD show. After the ticket is generated the traveler receives a message showing their destination and the remaining balance on their particular RFID card.

2. Literature Survey

Writing audit was done all throughout the entire project to acquire information and further develop the abilities expected to finish this task. The fundamental hotspots for this undertaking are past-related projects, research propositions, books, diaries, and online instructional exercises. This part centers around the essential ideas and all crucial speculations connected with this undertaking and the disadvantages of the ongoing system. RFID innovation can be successfully utilized in a number of uses because of its propensity for efficiency. As for its application, it's been a broad device for both following the travel transports. A major arrangement of RFID comprises two essential parts: The reader module and tags, which will be discussed in detail later in the paper. The primary thought behind this task is to gather the charge consequently utilizing the RFID innovation and GSM modem. In paper [1] the authors explained the advantages of RFID cards about their low cost. In paper [2] RFID cards and a reader is used to read card number which is sent to the database using WIFI. In paper [3] RFID

AUTONOMOUS VACUUM CLEANER BOT

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Abstract:
Over the years, science and technology have changed the way we live. Modern households are heading towards saving time and effort. In this scenario, vacuum cleaners play a vital role in making home cleaning easier. Here we present the development of an economical autonomous vacuum cleaner robot and the system is controlled by an Arduino. This autonomous vacuum cleaner is composed of a mobile robot and a suction device. The robot is navigated according to a controlling algorithm and it avoids obstacles using ultrasonic sensors.

Keywords: Vacuum Cleaner Robot, Random walk algorithm, Spiral algorithm, Ultrasonic sensor, Arduino.

Introduction:

The Internet of Things (IoT) is a network of physical items equipped with electronics, sensors, software, and network connectivity for data sharing. The Internet of Things allows users to sense and control objects over a network, allowing for direct integration of the physical world into computer-based systems. The robotics section covers robot design, operation, construction, and application. Individual growth and development have been aided by the Internet of Things and Robotics working hand in hand.

As people's desires grow, robots have recently emerged as a home appliance. More than ever, home appliance robotics research is gaining attraction. Several large cleaning equipment are already available for both residential and industrial use. However, their actions are non-autonomous, costlier and they can only conduct a limited number of cleaning functions. Hence, in this current hectic schedule, vacuum cleaners without human intervention and economical are more essential.

Literature review:

[1] Robots are human-like machines that can execute all of the tasks that people can in a fraction of the time. They cannot replace humans, but they can assist humans in performing many of their everyday tasks.

[2] Handheld robots need to be handled manually by applying push force to move from one position to another position.

[3] The creation of an efficient and automated robot increases home automation, resulting in greater convenience.

[4] The development of vacuum cleaner robot with robotic arm detects the obstacles with its tactile sensing system, but this system is costlier than conventional system.

[5] The robot detects obstacles and hurdles through ultrasonic sensors and can also be navigated using Bluetooth.

[6] The robot is navigated by some controlling algorithms. Path planning algorithms are used to identify safe, efficient and collision free path origin to a destination. There are different path algorithms like random walk, spiral, s-shape, wall follow algorithm.

[7] Genetic algorithm assists the robot in traversing the whole area by avoiding obstacles utilising several sensors, but this algorithm is complex and consists of several steps to determine the path.

[8] The application of the indices to the VC case study revealed that the lifetime of a VC is better and more cost effective in the vast majority of cases evaluated. It's both ecologically friendly and feasible.

SMART MOTORCYCLE SYSTEM USING FINGERPRINT

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Abstract
This paper is about building a real time vehicle ignition using fingerprint sensor. The starting of the bike's engine needs protection and access restriction. Two wheeler vehicles with common locks do not provide adequate security for the bike holder. Thieves are aware of the standard locks used on motorcycle and they may easily break the locks. As a result, more security options for the motorcycle which are unique and should be different from common key locks are required. The use of a biometric system can be a good and reliable security option. Unique finger impression ID is a reliable method for identifying people because each person's fingerprints are unique. Hence we are focusing on implementation of the motorcycle system using fingerprint with an alerting system using buzzer in this paper.
Keywords: Arduino, Relay, Fingerprint sensor, Biometric system, Alarming system.

1. Introduction
The prime factor of implementing this model is to secure the bikes from the vehicle thefts using biometric system. Biometric technology is the technique that requires the presence of a particular person. Biometric system includes various types such as face recognition, voice recognition, fingerprint recognition etc. Among all these techniques the fingerprint recognition is the effective one [1] as it is the unique impression of each person. The fingerprint recognition allows the users to store their fingerprints in the memory. The stored fingerprints are remained in the memory even in the presence of power failure [1][2]. This project focuses about developing a real time fingerprint based vehicle starter. The fingerprint technology eliminates the need for keeping the keys and allows only the authorized persons to access it. The main advantage of using a fingerprint pattern is that it is very low in cost as compared to other biometric systems. In this proposed model we are implementing an alarming unit using buzzer and it gets enabled when the unauthorized person is trying to access it. Arduino IDE software is used to store the fingerprints and to start the ignition of the bike.

2. Hardware Details
2.1 Arduino: Arduino is an open-source electronics platform based on easy to use hardware and software. Arduino boards are able to read inputs as light on a sensor, a finger on a button, or a Twitter message and turn it into an output as activating a motor, turning on an LED, publishing something online [3]. This board contains a USB interface i.e. USB cable is used to connect the board with the computer and Arduino IDE (Integrated Development Environment) software is used to program the board [4].

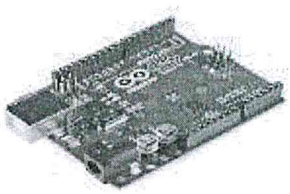

Fig2.1. Arduino UNO

2.2 Fingerprint Sensor: Fingerprint detection utilization has existed for identification. Every person has a separate model of the fingerprint made with ridges, which create whirls and loops that are unique to every person [5]. The features of fingerprint recognition systems include faster speed,

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HOME AUTOMATION FOR BEDRIDDEN PATIENTS USING BT VOICE CONTROL

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Abstract
Home automation sector is expanding rapidly which can be used to support bedridden patients. Patients who are confined to their beds are unable to perform any type of job without the support of others. Using voice instructions as an input to a microcontroller to operate home appliances is one solution to this challenge. Those who are confined to their beds can use voice commands to manage a variety of gadgets. The entire system is designed to be voice controlled, eliminating the need to type anything.
Key words: Home Automation system, voice commands, disabled people, Internet of Things.

Introduction

The notion of a home automation system has been around for a while and is getting more popular these days. [1].The world's demographics reveals a pattern in which the old population is quickly growing as people's average life expectancies rise. Home automation is aimed at two groups of people: those looking for luxury and those with special needs, such as the elderly and disabled. The goal of the Wireless Home Automation is to provide a system that can listen to voice commands and regulate the on/off status of electrical items in the home and can also control mechanical devices such as door etc.[2]The ability to operate household gadgets via smart technology could be extremely beneficial to people with physical limitations and the elderly[3].Now a days The Internet of Things is the most widely used platform for communication. The number of IoT users is expected to increase dramatically in areas where the economy grows rapidly[4].The main objective of this research is to develop a system that can act as a assistant for the elderly and physically impaired at home. [5].The majority of smart home systems communicate with each other via wireless technologies [6].Here we will be using Bluetooth voice control for arduino app as a connection between phone and Bluetooth. The user will be sending voice commands as an input to the Bluetooth via Bluetooth voice control app. Humaid AlShu'eili, Gourab Sen Gupta, Subhas Mukhopadhyay designed a Voice Recognition Based Wireless Home Automation System. The hardware design consists microphone ,central controller and appliance control modules .The communication .Zigbee protocol is used communication purpose. NorhafizahbtAripin and M. B. Othman developed a Voice Control of Home Appliances using Android with the help of Arduino. Input commands are provided either by touch or by voice.Operation of light and fan along with the speed of the fan are controlled with the help of input commands. A Graphical User Interface (GUI) is used for providing thinpt commands. Y ash M ittal, P aridhi T oshniwal, Sonal Sharma, Deepika Singhal , Ruchi Gupta5 and V. K. M ittal introduced a A Voice-Controlled Multi-Functional Smart Home Automation System uses a mc and voice recognition module for sending voice commands to the microcontroller. Raju Hajare, MallikarjunaGowda,Suhani Jain, Pooja Rudraraju and Apoorva Bhat introduced a Design and Development of Voice Activated Intelligent System for Elderly and Physically Challenged. Speech Recognition system is used for generating required input

FACE RECOGNITION USING MACHINE LEARNING

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Abstract
Face recognition has been considered one of the most fascinating domains over the last few years and has been among the most productive image processing applications. We are going to create a method for face recognition with the use of three convolutional neural networks, namely AlexNet, LeNet, and VGGNet, and their accuracies were compared to get a better understanding of the best network. The three networks were tested on the same dataset, then compared for accuracy. A real-time and a standard dataset were chosen to study the performance of these three CNNs. We have chosen a platform called Spyder to test our model since we have opted for a Python interface. This model is used to look at how well the three neural networks work with both standard datasets and real-time datasets over accuracy.
Keywords: CNN, AlexNet, VGGNet, LeNet, Convolutional Layer, Pooling Layer, Fully Connected Layer, Epochs, Accuracy.

1. Introduction

Facial recognition is a technology that identifies a human face from a digital image or video against a dataset of faces. It has numerous applications, which include automatic attendance monitoring systems in [1], emotion recognition in [2], security and surveillance, verification of identity, and significantly more. Face recognition's great potential in a variety of government and commercial applications makes it popular and has attracted research attention and increased its development over the last 30 years. The very beginning of the classification of faces was first proposed in [3]. Face recognition systems are now involved in numerous real-world applications, indicating that progress has been made [4]. Face recognition has moved quickly due to several things, such as the fact that there are already models that make the process easier and access to large databases of pictures.

The first signs of facial recognition were discovered in psychology in the 1950s, and it entered the engineering literature in the 1960s. Woodrow Wilson Bledsoe was the father of face recognition. He developed a system for categorizing facial images. Face recognition has gotten a lot of attention from pattern recognition and machine learning research organizations ever since the early 1990s. Chellappa et al. [5] proposed a few applications of face recognition technology and discussed their benefits and drawbacks in 1995. They did not, however, evaluate any system that could be employed in real-world applications. At least 25 face recognition systems from 13 different companies were available in 1997 [6]. Due to the obvious emergence of face recognition systems and their involvement in real-time situations, they became popular and drew a lot of attention.

The majority of face recognition systems are built around two major modules: feature extraction and classifiers. Today's facial recognition technology compares facial features to multiple data sets using random (feature-based) and photometric (view-based) features via complicated mathematical representations and matching processes. This is accomplished by comparing the structure, shape, and distribution of the face; the distance between the eyes, nose, mouth, and jaw; the outlines of the eye sockets; the sides of the mouth; the alignment of the nose and eyes; and the nearby area around the cheekbones. The most common methods for facial recognition are feature analysis, networks, eigenfaces, and automatic face processing. Face recognition systems have been designed using various feature extraction and classifier algorithms, such as the Geometric based method, which employs tools such as Support Vector Machines [SVM] [7], and the Statistical Approach, which employs tools such as Discrete Cosine Transform [DCT], and Neural Networks such as Convolutional Neural Network [CNN].

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Automatic Plant Watering System

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ABSTRACT

Watering is the most arduous and time-consuming ritual associated with gardening in daily life. Physically watering the plants only adds to the difficulty and is time consuming process already in place. So that we can lead a more intelligent existence, mankind has developed "Automatic plant watering system," which aids us in watering the plants naturally and conserves water. This automated plant watering system will ensure that the soil remains moist without the need for any human interaction. The AtMega328 microcontroller is used in this system. In addition to reducing labor requirements, this technique also allows us to store water, reducing the likelihood of overwatering. This technique was created with the hopes of replacing manual labor and making gardener's work easier. All plants exceed their capabilities when this design is enumerated in gardens. This Automated plant watering system eliminates the need for a human workforce and saves valuable time. To conserve energy, we can install solar panels on large administration buildings.

Keywords— Watering System, Arduino, Motor Driver, Ultrasonic Sensor, Moisture Sensor

I. INTRODUCTION

Despite the fact that the concept of a "person" is still prevalent in today's world of high-tech gadgetry, numerous automated systems are needed to ease human labor in their everyday lives. The Green House's increased humidity provides a source of water for healthy plants, which can thrive. It is common for people to neglect watering their plants owing to overly ambitious plans, causing them to fail to germinate properly. As a result, an automated plant watering system is a technique since it automatically waters the plants by going from one plant to another to measure the soil's moisture level. This system is less expensive and more reasonable than alternative systems, and it also saves time and effort because the work is completed automatically [1]. Regardless of the weather, this system is advantageous.

II. DESIGN AND IMPLEMENTATION

Figure 1 depicts a block diagram of the automatic plant watering system. The Arduino board contains both hardware and software. Arduino is connected to an L293D motor driver via a USB cable. The motor driver can also assist other parts. Motor drivers use the Arduino's programme code to control the gear motors.

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FACE MASK DETECTION AND TEMPERATURE SCANNING MACHINE USING ARDUINO AND ESP-32 CAMERA.

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Abstract:

Corona virus is responsible for many deaths in recent years. Effective approaches to restrain COVID-19 pandemic need high attention these days. Wearing face masks is one of the important measures for the personal protection to prevent the spread of corona virus. But most of the people are not wearing face mask in public places which increases the spread of many viruses. High temperature is one of the main symptoms of many viruses. So, face mask detection and temperature scanning is significant in public places. In this paper, a simple and effective model for monitoring face mask and temperature scanning with automated gate control is proposed. The model is implemented using Arduino Technology & ESP-32 Camera Module.

Keywords:

Face mask detection, Temperature Scanning, Arduino, ESP-32 Camera, Contactless temperature Sensor.

Introduction:

COVID-19 brought a drastic change in the lives of humankind. The corona virus disease originated at Wuhan city of China in December 2019, has spread to several countries including India. Due to the spread of this virus many people lost their lives across the world. According to World Health Organization (WHO) over 500 million COVID cases are confirmed and over 6 million deaths are reported globally. Only during a week in April, 2022 more than 5 million confirmed cases and over 18,000 deaths have been reported in the six WHO regions (i.e., Western Europe, Central and Eastern Europe, Asia, Africa, Mediterranean & Middle East, America) [18].

The corona virus in most cases is transmitted directly from person to person, but in some cases, it is indirectly spread via surfaces. Due to these reasons, many protectional safety measures were taken by World Health Organization (WHO) to reduce the spread of the virus like wearing face masks, maintaining social distance, quarantine for affected people, limiting citizens' movement within country borders as well as abroad.

One of the major symptoms of the virus is high temperature. So, temperature scanning must be deployed in public places to avoid the spread of virus to some extent. WHO has always given priority to ensure safety measures like face mask and respirators for the health care assistance. So, the importance of face mask is a crucial task in present situation. The proposed model will help the people in ensuring safety and health by implementing face mask detection and temperature scanning.

HEXACOPTER SURVEILLANCE FOR NATURAL DISASTER SEARCH AND MEDICIAL RESCUE

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Abstract:
Drones which are also known as UAVs (unmanned aerial vehicles) are successful in replacing humans in many aspects and they have a vast range of applications such as Aerial photography, Geographic mapping, Precision Agriculture, Search and Rescue, Military Purpose, Photogrammetry, delivery of medicine, conservation surveillance and many more. In this paper, we are going to explain in-depth the usage of drones in Surveillance and Health monitoring. In case of a natural disaster, it can scan the vast affected region and make the search and rescue (SAR) faster to save more human lives and provide crucial medical attention as early as possible. Drone surveillance facilitates gathering information about a mark as captured from a distance or altitude. Unmanned aerial vehicles (UAVs) can also contribute real-time visual data and information in the aftermath of an earthquake or hurricane. When an incident or disaster threatens lives and livelihoods, emergency responders need knowledge and real-time imagery to make promising outcomes and save time. UAVs can give situational perception over a large area quickly, lessening the time and the number of rescuers required to locate and protect a lost or injured person. They are also called the eye in the sky. Rescue drones are designed to procure cost-effective, imaging, and real-time data, day or night, in challenging situations and without any hazard to personnel.
Keywords: UAV, Aerial photography, Geographic mapping, Precision Agriculture, Photogrammetry, conservation surveillance, Earthquake, hurricane

1. Introduction:

Drones can accomplish a variety of activities in locales where people cannot go in. Continuous surveillance can be done utilizing a drone. Surveillance entails the survey of a person, a group of people, their actions, infrastructure, or buildings to collect, manage, or guide information.
Surveillance can take numerous forms, including camera surveillance, GPS monitoring, radio surveillance, and biometric surveillance, among others. Traditional manual monitoring methods have complications in efficiently locating and reaching areas of concern or defects in facilities. Furthermore, traditional surveillance is a labour-intensive task: many repetitive actions in diverse job occasions necessitate a large number of people, and labour expenses raise year after year. UAV systems are becoming more stable and mature as unmanned aerial vehicles (UAVs), computer vision, and sensor technologies advance, allowing them to handle these tough jobs at a cheaper cost and with greater security and reliability.

Through our system, when there is an emergency in a nearby area that the rescue team cannot reach in time due to heavy traffics and road damage at those particular periods, we will be sending our surveillance and health monitoring drone to the affected area. Using our system, we will be measuring the heartbeat rate and temperature of the victim by pulse sensor and temperature sensor. These results will be displayed on LCD and a message is sent automatically if the results are abnormal to the emergency numbers through the GSM module.
The rescue team will review the victim's results and provide medical help as quickly as feasible.

2. Literature Review:

From [1], the modelling of a four-rotor vertical take-off and landing (VTOL) UAV known as the quadrotor aircraft is surveyed and also explained the development of a PID (proportional-integral-derivative) control method to obtain stability in flying the Quad-rotor flying object. In the study of [2], they studied and depicted the behaviour of the Hexacopter under diverse payload parameters and

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Title

Pre-Programmed Smart Human Companion Bot

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B.Vasantha Rani

Abstract

Robotics is an enhanced field of blueprinting that includes the design, creation, and operation of robots. In day-to-day life, old people face the difficulty of memorizing their medicine timings. The proposed system presents a human companion bot that assists the patient as a voice reminder. This bot reminds the patient to take their medicines through pre-programmed parameterization. It promotes some functionalities such as face detection, face recognition, and movement-based voice reminder. In experiments with a real bot, we can show that the approach enables a patient to take their medicines in time. The proposed system is precise and well organized and also can be developed in discrete methods.

Key Words

Intimation Technology, Face recognition, Face Detection, Voice Reminder, Movement Control

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Title

PARTS OF SPEECH TAGGING USING VITERBI ALGORITHM

Authors

N.Jahnavi
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N.Venakata Vardhan
K.Uday Kishore
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Abstract

Part-of-speech (POS) tagging is a popular Natural Language Processing process that refers to categorizing words in a text in correspondence with a particular part of speech, part of speech (POS) tagging is the ability to computationally verify that the POS of a word is activated by its use in an explicit context. POS tagging is changing progressively fashionable lately. Text to speech, syntactical analysis, and artificial intelligence all get pleasure from POS tagging, which is a good type of preprocessing tagging. once it involves POS taggers, they have to be wellversed in the term. However, if the quantity of words is inflated to 1,000,000, users are unable to finish the POS tag. we have a tendency to gift the Viterbi methodology during this study to help computers in tagging lexical classes effectively. The Viterbi formula uses dynamic programming to unravel issues. As we have a tendency to all understand, the word is kind of sensitive to its placement. The word's POS is connected to the words around it. we have a tendency to run simulations to examine however Viterbi Algorithms operate in POS taggers and calculate accuracy.

Key Words

PARTS OF SPEECH TAGGING USING VITERBI ALGORITHM

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Title

PREDICTION OF LONG TERM DISEASES CAUSED AFTER COVID-19 USING CNN AND RANDOM FOREST

Authors

Kandregula Jayasri
Sai Pavitro Mishra
Gayatri Metta
Lanka Swanitha
Dr. Bode Prasad

Abstract

COVID-19 has created a major impact on healthcare crises across the globe. Many people have affected by this virus with mild to severe symptoms. In most of the cases people with severe symptoms lead to death causing severe problems related to heart , lungs etc. Most of the people lost their lives during the outbreak of covid-19 . Though the recovery rate is good ,most of the people are identified in developing deadly diseases after getting recovered from this virus. On studying the health history records of different types of people affected with covid-19 ,it is derived that in most of the cases people are suffering with diseases related to heart , kidney , lungs etc.The central objective behind this research is to identify the covid-19 patients being affected with such deadly diseases after their recovery so that doctors can easily treat the patients without any complications in future.covid-19 dataset is collected by correcting it with missing and redundant values which is trained with different machined learning algorithms like random forest , decision trees , svm and convolutional neural networks . The proposed model achieves an average accuracy (96%) , precision (95.24%), and recall (92.05%) also prove the utility of the adopted approach in comparison to other techniques for the prediction of diseases.

Key Words

Covid-19, random forest , convolutional neural networks , Machine learning .

Cite This Article

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JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

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Prediction of Heart Disease Using Machine Learning Classifiers

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Abstract:

The Heart is an important key organ of the human body which supplies blood into all the other constituents of the human body. A lot of people had been suffering and dying from various heart diseases making it the No 1 in the Cause of Death in the world. The people who are dying from it is being swiftly increasing every year. On average, it takes 17.9 millions of lives per year and still increasing enormously. For the diagnosis of heart disease it costs a huge amount of money for a person and many can't afford it, there has to be a practice that can be helpful for the people and with the help of this practice they can detect the chances of having a heart disease. Therefore, we came up with an idea of developing a web application that can be used by people which helps them to detect their chances of having a heart disease, this system will take various attributes. In this, we took various Machine Learning Classifiers which are considered as best in producing accurate results and implemented them.

Keywords: heart, disease, data, machine learning, classifiers.

Introduction:

As the chances of having a heart disease is quickly growing we are making it to be available each and every person by building it as a webpage. Many Health Organizations giving their best efforts for identifying and treating heart diseases, yet the number is still increasing. Therefore, we came up with a web application which can be used by everyone which helps them for identifying their chances of detection of heart disease, this system will take various attributes (Symptoms) for it, which are the results of few tests performed. In this, we are using 3 major machine learning classifiers that are Decision Trees, Random Forest and Extreme Gradient Boosting classifiers for making the prediction of heart disease. We are using the proposed model which is developed as the combination of above three classifiers which produces the best results.

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DISEASE PREDICTION OF VARIOUS LEAVES USING IMAGE PROCESSING TECHNIQUES

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ABSTRACT:

Agriculture plays a vital role in Indian economy but owing to changing climate, crops often getting impacted, as a result agricultural yield decreases drastically.If the condition get worse, crops may get vulnerable towards infections caused by fungal, bacterial, virus, etc. diseases causing agents.Our proposed model gives a programmed technique to decide leaf infection in a plant utilizing a prepared dataset of leaf images utilizing various algorithms like support vector machine , logistic regression, k-means. The test set is used to check whether an image enter in the system contains disease or not. This model gives a precision of the outcomes produced utilizing different group sizes, advanced tentatively, with image segmentation.

KEY WORDS:

Classification, image segmentation, image accuracy, pre-processing.

INTRODUCTION:

Visual symptoms in the leaves are used to detect diseases in leaves. There is need for an automatic system used for leaf disease detection because the disease cannot be detected by naked eye. Our technology has grown to such an extent that a machine is capable enough to predict the disease by looking at a high definition image of that leaves at its early stage itself. The objective of our research is to find out the disease in a leaf. This process of detection can

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JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

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Predicting Crime in a particular region using Decision Trees

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Department of Information Technology, Vignan's Institute of Information Technology (VIIT)

Abstract:

Crime analysis and prevention is a systematic approach for identifying and analyzing patterns and trends in crime. In general, while we are going out to any place it was quite normal to check for weather and traffic through network. Similarly, we can also check for the crime rate before going. Using the concept of Machine Learning, we can extract previously unknown, useful information from a structured data i.e., crime data. Predicting a crime in a particular region can be done based on the data that was collected. Using this concept, we can predict the high probability of crime rate using Decision Trees. It also provides visualization techniques to understand easily. During prediction we will undergo various techniques like Data collection, Data cleaning, Data handling, Predictive modeling, Model selection, Prediction, Visualization using Random Forest classification.

With the results, we can provide identification of crime by predicting the crime rate with an improved accuracy than with other methods which will directly help police to practice and for better strategies.

Introduction:

Crimes now-a-days are increasing day by day and with different level of intensity and versatility. The result is great loss to society in terms of monitory loss, social loss and further it enhances the level of threat against the smooth livelihood in the society. To overcome this problem the computing era can help to reduce the crime or even may be helpful in predicting the crime so that sufficient measures can be taken to minimize the loss to property and life. The crime rate prediction strategies can be applied on historical data available in the police records by examining the data at various angles like reason of crime, frequency of similar kind of crimes at specific location with other parameters to prepare the machine learning model for crime prediction. It is the major challenge to understand the versatile data available with us then model it to predict the crime incidence with acceptable accuracy and further to reduce the crime rate.

The main scope of the project is to predict the crime rate in a particular region based on the historic data and visualize it graphically using statistical tools so that, it is easy to look and understand the data to support public safety, financial success and better outcomes. Public safety and protection related to crime, and a better understanding of crime is beneficial in multiple ways: it can lead to targeted and sensitive practices by law enforcement authorities to mitigate crime, and more concerted efforts by citizens and authorities to create healthy neighbourhood environments. With the advent of the Big Data era and the availability of fast, efficient algorithms for data analysis, understanding patterns in crime from data is an active and growing field of

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Internet of Things for Smart Agriculture – State of the Art and Challenges

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More details

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KEYWORDS

internet of things (IoT) • precision farming • unmanned aerial vehicles (UAV) • agriculture

TOPICS

Environmental monitoring

ABSTRACT

Agriculture is the primary source of food production for humankind. The drastic increase in the global population is paving the way to directly increase the food productivity creating enormous pressure on the agriculture sector. The demand for food production is increasing rapidly every day across the globe. According to the UN world population index, the world population is expected to reach 9.7 billion by 2050. Doing traditional conventional farming will not be sufficient for the production and catering to the needs of 9.8 billion people. We are now shifting from conventional traditional farming to new advanced precision farming methods to meet the demand. The introduction of the Internet of things (IoT) into the agriculture sector has changed the dynamics of the sector. The IoT based devices are mainly proving to be efficient in giving a high performance with low energy usage. IoT based devices automatically monitor and maintains agricultural farms reducing the minimal use of human involvement. This article mainly highlights the recent IoT based products and their usage in the agriculture sector. The public and private projects across the globe which provide feasible growth in the agriculture sector are discussed. Further, this article discusses the use of unmanned aerial vehicles (UAV) and their applications in the agriculture sector. After a thorough review of the future of IoT in the agriculture sector, its Applications, challenges, research potential and limitations are briefly discussed.

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TOMATO PLANT DISEASE DETECTION

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Abstract

Identification of plant diseases plays the key role in preventing the losses in the yield and quality of the agricultural product. The studies of plant diseases implies to studies of visually observable patterns perceived on the plant. Health monitoring and disease detection on the plant is very crucial for sustainable farming. It is a complicated task to monitor plant diseases manually. It requires a tremendous amount of work, expertise in plant diseases, and also require excessive processing time. Image processing makes it easier in detecting of plant diseases by capturing the images of the leaves and comparing them with the data sets. The data set consists has different plants in the image format. We made use of Convolutional Neural Networks for accurate results. After the detection of the disease, it suggests the fertilizers that can aid as being the cure for disease.

Keywords: Plant disease detection, NumPy, TensorFlow, Keras, OpenCV, Convolution Neural Network, Computer Vision

I Introduction

Trees and Plants are a boon to the mankind. There are approximately 380,000 plant species in the world. Out of these plant species only 150 species are cultivated and edible. We need to protect these plants for our survival. These plants are cultivated by the farmers for generations. Agriculture is the largest employment in the world and our country is the 2nd largest producer of agriculture product. With the growing population there is a necessity to increase the food production. By the year 2050, the requirement for food increases to 70% of what we are producing today. Though Agriculture is the largest employment it has numerous impediments to it. Traditional methods of farming are no longer feasible to provide the required amount of food. So, people started using modern methods of farming. With the advancement in technology and research assisting the farmers in cultivation we are able to increase the yield. Protecting the plants not only helps us to increase the productivity. The main objective is to detect the plant leaf diseases using real-time video and image capturing. This work aims at identifying the type of disease and suggesting the right fertilizers, insecticides and pesticides. These diseases can be identified using computer vision and machine learning techniques. The computer vision has seen tremendous amount of development over the years. It helps us to identify and classify the diseases easily. In the present day most people have access to a smartphone.

Article PDF Available

Blind Assistance Using Deep Learning Mechanism

August 2022

Authors:

Sai Naidu B Rishikanth M Nitisha Narasimha Gudikandhula

Show all 5 authors

Abstract

People who are visually impaired confront numerous challenges in their daily lives. They frequently seek assistance from others. Computer Vision-based solutions are emerging as one of the most promising possibilities among the different technologies being used to assist the blind due to its cost and accessibility. This proposal suggests a system for those who are blind or visually challenged. The project's major goal is to create an application for the blind and low-vision community. This research project employs artificial intelligence to describe people, text, and things. The project combines the power of AI to create an intelligent system that will assist you throughout the day. The Proposed model presents a system which captures real time objects. The person using this model will switch on their camera and put it straight when he is walking and the model captures all the Real Time Objects and objects captured will be converted into speech and let visually challenged people who are using this model know what object is at what distance from them. Introduction With the recent rapid development of information technology (IT), much research has been done to eliminate the inconvenience. We have provided various conveniences to people in their daily lives and as a result [1]. Nevertheless, there are still many inconveniences for the visually impaired. One of the biggest inconveniences that blind people experience in their daily lives is finding information about it. People used cane sticks before the technology advanced [2]. Problems with objects and movement indoors. It's hard to recognize simple objects, and it's not easy to distinguish them from objects. It has a similar shape. Previous studies included object analysis using ultrasonic sensors. However, these methods are difficult. To know exactly where the object is, especially when there are obstacles. In this paper, we will analyze the exact object. Use deep learning object detection techniques to provide information and locate. In addition, speech recognition and speech guidance technology is integrated so that visually impaired people can recognize the location of the object they want to find by speaking. The object detection algorithm is developed based on the object single-shot multi-box detector (SSD) structure. Technology that synthesizes the position of items so that they can be output and item name composition is done using Text-to-Speech (TTS). In this paper, we propose efficient object detection. A system for finding objects in a particular space without the help of the outside [3], while paying special attention to the visually impaired. Review of Literature This study examined the existing approaches for spotting models as well as the standard datasets. This paper examined a variety of detectors, including one-stage and two-stage detectors that aided in the study of various object detection methods and gathered several classic and novel applications. There were also other branches discovered that dealt with object detection. Furthermore, some development patterns have been recognized for better following of the set of art algorithms and subsequent operations.In this work, a fully region-based convolution network was presented. RFCNN is used for accurate and efficient object recognition. complete convolution image classification backbone for object detection for this task. For object detection, this research provided a simple and effective RFCNN architecture. Compared to the faster

SIGN LANGUAGE GESTURE DETECTION USINGDEEP LEARNING AND TRANSFER LEARNING

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Abstract

Physically challenged people like deaf and dumb face difficulty in communicating with others. They generally communicate using sign language gestures. Every normal person may not be aware of the sign language gestures, and it is challenging to learn the language. There have been various technological improvements, as well as much research, to aid the deaf and dumb. Deep learning along with computer vision can be used too to make an impact on this issue. In this project, a sign detector is created that identifies the gestures so that normal people can also understand what they are trying to convey. Further, this project uses voice assistance and text translation into multiple languages for better communication.

Keywords: Deep Learning (DL), Computer Vision (CV), Convolutional Neural Network (CNN), Residual Neural Network (ResNet50), TensorFlow Object Detection, TensorFlow JS

I. Introduction

Sign language is a type of communication used by those who have difficulty in speaking or hearing. Disabled People make use of signs or gestures as a non-verbal communication tool to express their thoughts and emotions to others. However, because these ordinary people have a hard time understanding their expressions, experienced sign language experts are required. There is an upsurge in demand for such services in recent years. Some other kinds of services, such as video remote human interpreters requiring a high bandwidth internet connection, is established, providing an easy to use sign gesture interpreter service that may be utilized and benefited [1].

In order to address this problem, several algorithms like Convolutional Neural Network (CNN), Residual Neural Network (ResNet50), and Tensorflow Object Detection (SSD MobNet) were used to choose the best algorithm which gives accurate results for this problem.

Initially, images were collected from the web, and also a form was created and the images from our university students were collected to get more variations and make the model efficient. The analysis of the paper is organized as follows: Section II gives a summary of the performed related work; Section III briefs about the existing system and Section IV about the proposed one. Section V gives a detailed description of the insights of the dataset. Section VI overviews the various algorithms used and Section VII discusses the results obtained. At last, Section VIII expresses the conclusion and possible developments.

II. Literature Survey

Several kinds of research have been done focusing to make communication easy for deaf and dumb people. Different algorithms and data processing techniques were used and accomplished unique accuracies and results.

J. Rekha, J.Bhattacharya, and S. Majumder [2] proposed two novel approaches for hand sign recognition that will detect sign language gestures in real-time environment. In their research, Knearest Neighbor and Support Vector Machine (SVM) are used for hybrid classification of single signed letters. Additionally, they proposed finger spelled word recognition using Hidden Markov Model (HMM) for a lexicon-based approach. The advantages of SURF and Hu Moment Invariant methods were combined and used as a combined feature set to achieve a better detection rate. The obtained the results as follows:

SOCIAL DISTANCE MONITORING SYSTEM

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Abstract
In this paper, we propose a Social Distance Monitoring System where we have used Computer Vision and Deep Learning techniques for object detection using the YOLO model with the pre-trained COCO data set to detect the people in a video stream. For the detected people in a video stream, we find or compute the pairwise distances between them by calculating the centroid, and based on the distances which have been computed, we have determined whether the social distance rule is being violated or not. We have used the automated self-monitoring system using already existing surveillance systems which include surveillance cameras which are also known to be CCTV, and dome cameras which take input and help in maintaining social distance in public places or public locations. This application or proposed model also aims to provide a mail system to alert the higher authorities whenever the number of violations is more than the threshold value given.

Keywords: Computer Vision, detection, YOLO model, COCO data set, self-monitoring system, mail system

Introduction
Covid-19 created great chaos around the world in early 2019 as it is an infectious disease which is caused by the Sars-2-cov virus and it greatly affected the entire nation concerning the global economy and the health of many people around the world. During the outbreak of a covid-19 pandemic, many countries have implemented certain measures of social distancing which include avoiding traveling or restricting traveling, shutting down the public places, and warning people to keep a minimum distance of 2–3 meters from each other when they have to go out.

So, many factors affect an individual's health and the economic breakdown of the nation. The WHO proposed to follow certain aQuantive measures to prevent the spread of disease which is caused through sneezing, coughing, touching hands-on surfaces, etc.

In this kind of situation, monitoring the people to keep a certain distance from each other through human supervision is nearly impossible as the people who are working to monitor such situation might also get infected as the disease spreads faster which causes great havoc, to prevent that from happening, the certain system has to maintain a social distancing in a public place with the help of online surveillance systems like CCTV which automatically finds out the number of serious violations and reduces the human effort.

Review of Literature
In 2001, viola and jones had come up with an approach for object detection using the AdaBoost learning algorithm. In the year 2005, N.Dalal and B.triggs used a feature descriptor for object detection named Histogram of Oriented Gradients (HOG). In the year 2008, P.Felzenszwalb et has

DISEASE PREDICTION USING MACHINE LEARNING

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Abstract

We live in a fast-paced world where people do not give enough time for their health and well-being. As a result, diseases are on a rise these days. Factors like pollution are also playing a huge role in people getting sick and prone to some serious medical issues. In some cases, people even lose their lives if they aren't given treatment on time. Hence prediction of diseases at early stages is very vital. It becomes difficult for even highly qualified doctors to predict the exact disease with given symptoms. The project aims to provide an application for the users where they can enter their symptoms and based on the data provided, the machine learning model incorporated into the application will predict the disease and the risk factor involved. If the risk involved is very high, then the application will suggest nearby hospitals depending on the geographic location of the user. If the risk involved ranges from low to medium, the users will be suggested nearby chemist shops and home remedies to overcome the disease.

Keywords: Supervised learning, Machine Learning, Predictive Models

Introduction

Disease Prediction using Machine Learning is a system that predicts the disease based on the information provided by the user. It also predicts the disease of the patient or the user based on the information or the symptoms he/she enters into the system and provides accurate results based on that information. If the patient is not very serious and the user just wants to know the type of disease, he/she has been through. It is a system that provides the user the tips and tricks to maintain the health system of the user and it provides a way to find out the disease using this prediction. Now a day's health industry plays a major role in curing the diseases of the patients so this is also some kind of help for the health industry to tell the user and also it is useful for the user in case he/she doesn't want to go to the hospital or any other
clinics, so just by entering the symptoms and all other useful information the user can get to know the disease he/she is suffering from and the health industry can also get benefit from this system by just asking the symptoms from the user and entering in the system and just a few seconds, they can tell the exact and up to some extent the accurate diseases. This project is previously done by many other organizations but we intend to make it different and beneficial for the users who are using this system. This Disease Prediction Using Machine Learning is completely done with the help of Machine Learning and Python Programming language for it and also using the dataset that is available previously by the hospitals using that we will predict the disease. Nowadays doctors are adopting many scientific technologies and methodology for both identification and diagnosing not only common diseases but also many fatal diseases. Successful treatment is always attributed to the right and accurate diagnosis. Doctors may sometimes fail to make accurate decisions while diagnosing the disease of a patient, therefore disease prediction systems that use machine learning algorithms assist in such cases to get accurate results. The project disease prediction using machine learning is developed to overcome general disease in earlier stages as we all know in the competitive environment of economic development mankind has been involved so much that he/she is not concerned about health. According to research, 40% of people ignore general disease which leads to harmful disease later. The main reason for ignorance is laziness to consult a doctor and time concerns. According to research, there are 70% of people in India suffering from general diseases and 25% of people face death due to early ignorance. The main motive to develop this project is that

DOOR UNLOCK SYSTEM USING FACE RECOGNITION AND BIOMETRIC DEVICE

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Abstract
Automation is a necessity in the current times as it makes processes more economical and affordable in the long run. Once a process is automated the only check that is to be performed is whether it is turned on or not. Automated processes are not prone to errors and even if an error is identified rectification is easy and can be applied system-wide without any delay. In this project- Door Unlocking System is proposed that uses facial recognition and biometric based IoT technology to automate the entire system. Today we are facing security threats in every aspect. One of the problems we face in daily life is unauthorized persons entry which causes many security issues. So we can resolve our home or workplace entry level security issues by allow only authenticated or authorized people in without any manual checking by using "Face Recognition and biometric based door unlock system" that uses Raspberry pi. The Face recognition module to capture Human images and to compare with stored database, if it matches with the authorized user then the system will unlock the door by an electric door lock. Biometric device is used to capture the biometrics and to compare with stored database; if it matches with the authorized user then the system will unlock the door using an Electric Door Lock.

Introduction

The most important feature of any home security system is to detect the people who enter the house. The major drawbacks in a common door lock are that anyone can open a conventional door lock by duplicating or stealing the key that's why we are using smart lock. This door unlock system is used face recognition and biometric. The camera is used to capture the image and biometric device is used to scans biometrics and compare with the database. If the credentials were matched then provide the authentication.

The automated Door Unlocking system implemented with face recognition using image processing with combination of IoT technology will overcome the disadvantages of other proposed technologies.

This explains how automated Door Unlocking system implemented with face recognition and biometric devise works:

(1) All the hardware will be kept inside home.
(2) The hardware except raspberry pi could be put in the box.
(3) When a person enters in front of main door, the face recognition will start.
(4) If it fails to identify the face in cases like face damage or masking, finger print scanner also set to recognize the authorized persons.

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This door unlock system is used face recognition and biometric. The camera is used to capture the image and biometric device is used to scans biometrics and compare with the database. If the credentials were matched then provide the authentication.

SMART ATTENDANCE AND PAYROLL MANAGEMENT USING FACE RECOGNITION

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Abstract
The process of tracking working times is always difficult. Traditional methods of tracking attendance can be a time-consuming process. Some of the traditional methods for keeping track of time include calling out a person, using time sheets, using a time card, and using a perforation clock. Each of these options has its own drawbacks such as risk of human error, time theft, time consuming, ineffective and outdated, excessive paperwork, outdated systems, proxies To overcome this, we intend to develop a deep learning model to automate the attendance tracking process We will start training our model by using the images of students and the faculty. The proposed model captures class snapshots for a specified period of time and detects the face to recognize the person by comparing the detected face to the images in the training dataset using deep learning algorithms such as Haar Cascade and Edge Detection All the data related to attendance could be retrieved through a web application built with ReactJS and all the data is stored in cloud storage technologies like MongoDB and Amazon S3. By upgrading to this automated model we gain major benefits like prevent payroll errors for staff, prevent time consumption, improve efficiency and productivity

Keywords: Haar Cascade, Edge Detection, ReactJS, MongoDB, Amazon S3

1 INTRODUCTION

Many educational institutions still use traditional methods to track attendance, which is a more tedious task. The most common traditional methods practiced in daily life are, the student is supposed to sign the attendance sheet by hand, which is passed throughout the class while the lecturer is giving the lecture, and sometimes this particular approach allowed students undoubtedly to cheat about attendance, as a student in class may sign for a student who is physically absent This attendance sheet is often misplaced or forgotten without the lecturers' knowledge. Another more rigorous traditional method that is actually commonly used is the role number calling system, where students are supposed to answer role calls by faculty members. In this way, students can also cheat on attendance by responding. This is also a time-consuming task Human errors can lead to missing attendance data for faculty, which could lead to conflict over payroll for staff. Using face recognition technology for attendance recognition is a smart way to manage attendance. Face recognition is a more accurate and faster technique than other techniques, which reduces the chance of prattendance. The ability to recognize faces is a passive process that does not require any action on the part of the person being identified. With the help of face recognition, we could save time spent on attendance marking and make the entire process much more efficient by eliminating the setbacks caused by traditional methods and also the accurate calculation of payroll for staff.

2 DESIGN

The main purpose of this project is to track the faces of the students and faculty, identify who is present, and calculate the payroll. This work uses deep learning algorithms like Haar Cascade and Edge Detection to identify and recognize the student and lecturer faces from the real-time images captured by using a camera. The images are processed to match with the pre-trained dataset. The

INTELLIGENT TRAFFIC MANAGEMENT SYSTEM USING YOLOv5

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Abstract- Intelligent Traffic Management System using YOLOv5 is a system which detects the type of vehicle and uses number plate to identify the detected vehicles. The objective in our paper was to design an efficient automatic authorized vehicle identification system by using the vehicle number plate and vehicle type. The major focus of this project is to enable this system in villages to provide more security and control the traffic in the village more efficiently. After detecting the vehicle its number plate is identified using the model which was trained using YOLO algorithm. After analysing the image, the model will give specific information like the number plate, type of vehicle. The identified number plate is sent to Optical Character Recognition(OCR) which will help find the number inside the detected plate. By utilizing the license number extracted from the detected vehicle it can be used to create logs, keep a vigilant eye and also for various purposes.

Keywords- YOLOv5; number plate detection; vehicle detection; Indian vehicles; optical character recognition; custom model.

I. INTRODUCTION

Due to high mobility and ability of covering areas at different locations and altitudes, remotely piloted vehicles are increasingly used in traffic monitoring and surveillance. The major challenging is to use the aerial images precisely for detecting the vehicles and to count them for traffic monitoring purposes in real-time.

Based on convolution neural network (CNN), numerous deep learning techniques were recently proposed for recognition and classification in computer vision in real time. However, the performance of these algorithms depends on various scenarios in which where they were used.

In cities there will be many CCTV cameras are fit at some places and is monitored by security guards which provides security to the people living in cities and big town. When it is considered about the people in village installing these cameras, maintaining the people for constant monitoring is difficult. So, in order to provide the security for the people in village a system is developed which does not required any human effort for monitoring. From [1]-[5] it can be seen that to detect the license plate region-based approach, Vertical Edge Detection (VEDA). In our paper, a model was trained which will automatically detect the type of vehicle and the also save the number plate of the detected vehicle which can be used to find the owner of vehicle.

II. LITERATURE REVIEW

ANPR Framework utilizing OCR at the centre of the framework is the OCR (Optical Character Recognition framework) which is utilized to extricate the alphanumeric characters show on the number plate. To do this it to begin with employments an arrangement of picture control strategies to identify and normalize and improve the picture of the number plate. There are two components within the framework, the cameras which at the front-end and the inaccessible computers at the back-end. More often than not two cameras are used at a time to extend the productivity.

Intelligent Traffic Control system helps us detect type of vehicles which are widely used in India like auto-rickshaws, lorries etc. The objective is to plan a proficient programmed authorized vehicle recognizable proof system by utilizing the vehicle number plate and vehicle type. Since there is continuous traffic, we have to consider a model which have less inference time and decent accuracy. After observing different models, the YOLOv5 was considered because of the various features it offers:

- It was implemented in PyTorch which has simpler support and easier deployment.

A Novel Approach in Bio-Medical Image Segmentation for Analyzing Brain Cancer Images with U-NET Semantic Segmentation and TPLD Models Using SVM

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Abstract:

Many medical applications need to be able to separate and find brain tumor's using CT scan images. There have been a lot of recent studies that used distinguish between benign and malignant tumour to find out where and how big a tumour is. Even though they did well at segmenting the Medical Image Segmentation Decathlon (MISD) dataset, their complex structure requires more time for training and analysis. To build a flexible and efficient brain tumour segmentation system, we offer a pre-processing method that only works on a small part of the images instead of the whole Image. U-Net with three parameters Deep Learning models can be trained more quickly and with less overfitting with this method. Support vector machine is used in the second stage because there are fewer brain images for each slice. When U-Net+SVM looks at data this way, it can find both local and global features in it. The Three parameter method had shown to be more accurate at separating brain tumors from healthy parts of the brain than other models. The U-Net+SVM+Three Parameter Features method requires the tumour to be in the middle of the model and to be there. A lot of testing on the Medical Image Segmentation Decathlon (MISD) dataset showed that our model can get good results: Dice scores for overall cancer, more cancer and the core of the tumour are all 96%, which is the same for all three.

Keywords:

probability density function, U-Net, medical image decathlon, deep learning, supervised learning, brain cancer segmentation, support vector machine, expectation maximization (EM) algorithm

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A bi-directional deep learning architecture for lung nodule semantic segmentation

Debnath Bhattacharyya, N. Thirupathi Rao, Eali Stephen Neal Joshua & Yu-Chen Hu

The Visual Computer (2022)

Abstract

Lung nodules are abnormal growths and lesions may exist. Both lungs may have nodules. Most lung nodules are harmless (not cancerous/malignant). Pulmonary nodules are rare in lung cancer. X-rays and CT scans identify the lung nodules. Doctors may term the growth a lung spot, coin lesion, or shadow. It is necessary to obtain properly computed tomography (CT) scans of the lungs to get an accurate diagnosis and a good estimate of the severity of lung cancer. This study aims to design and evaluate a deep learning (DL) algorithm for identifying pulmonary nodules (PNs) using the

An Automated Examination System for Evaluation of Descriptive Test

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Abstract

An Automated examination system for evaluation and descriptive test is an online based examination system in which exams are conducted online. The primary purpose build an automated examination system. There is no need of paper and pen. Here students can write exam using internet or intranet. We will mainly use Machine Learning, generates a descriptive test automatically. The main objectives are analyzing sentence and find the semantic meaning of student answer and compare with actual answe final scores. Now compare the automated evaluated score with the manual evaluated score with a specific threshold if threshold is deviated then with use of mach automated evaluation process. It saves lot of valuable time of teachers, reduce work, and complete the evaluation on time.

Keywords

NLP, Exams, Evaluation, NLKT, Similarity, Online Test.

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Assistive Accessibility Suite

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Abstract

Assistive Accessibility Suite is a cross platform desktop application written in python which is specially tailored for people suffering from Amyotrophic lateral sclerosis, a over their computer using their voice without any modifications to the current UI by implementing a carefully designed GUI system that uses a transparent grid on the scr edge technology enables our users to navigate and interact with the personal computer of their choice using nothing more than their voice instead of a traditional inp seamless manner. Our purpose can be flexibly extended to consumer goods like the television, which are better used with voice instead of the traditional remote-contro designed and specifically trained to aid and improve the accessibility for those suffering from Amyotrophic lateral sclerosis and Parkinson's disease, making their interact mobile phone completely seamless and easy to use without the need for an adaptation of the host website nor the modification of the computer they use, making this res and social terms. Further extension of this research enables ease of use for everyone, with the advancement of voice recognition, rendering the use of any sort of remote keyboard) less suited for low level commands. This makes the Assistive accessibility suite a very attractive model for development for the greater good of the society w (time and monetary) on both the user and the developer.

Keywords

Voice Control, Voice Automation, Desktop Automation.

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An Efficient Method for Facial Sketches Synthesization Using Generative Adversarial Networks

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Abstract

The synthesis of facial sketches is an important technique in digital entertainment and law enforcement agencies. Recent advancements in deep learning have shown its possibility in generating images/sketches using attribute guided features. Facial features are important attributes because they determine human faces' detailed description and appearance during sketch generation. Traditionally, the forensic or composite artist has to sketch by interviewing witnesses manually. To automate this process of face sketch generation, a deep learning-based generative adversarial network incorporated with multiple activation functions is proposed for its efficiency improvement. The proposed model is extensively tested using different evaluation metrics such as RMSE, PSNR, SSIM, SRE, SAM, UIQ & BRISQUE.

Keywords

Sketch Synthesis, Face Sketch Generation, Attribute Guided, Generative Adversarial Networks (GANs).

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A fuzzy adaptive symbiotic organism search based hybrid wavelet transform-extreme learning machine model for load forecasting of power system: a case study

Jyoti Ranjan Nayak, Binod Shaw & Binod Kumar Sahu

Journal of Ambient Intelligence and Humanized Computing
14, 10833–10847 (2023)

Abstract

The accuracy of electric load forecasting is a most influential factor in electricity market for reliable and economic power supply. The load demand is influenced by the weather condition. This paper demonstrates the performance of hybrid 3-level wavelet transform extreme learning machine for short term (day ahead) and medium term (season ahead) load forecasting by conceding weather condition (temperature, humidity and pressure).

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Packet Filtering Using Machine Learning Models

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ABSTRACT

One of the severe issues in the present generation is the malware or malicious data. The increase in internet-connected devices due to the implementation of IoT and Industry 4.0 causes a significant challenge for the Intrusion Detection System to process a massive amount of network traffic to segregate the cyber attacks from non threatening traffic. This project has proposed a machine learning based Packer Filtering System that can detect Intrusion by analyzing network traffic behavior and stop the attacks. To prepare a machine learning model that can check the malicious data, the information is gathered from the validated internet source. This consists of collection of data sets fromKDD-cup data to train a model for filtering of packets and to check the which model gives the highest accuracy to use for filtering of packets.

Index Terms:
Machine Learning, Malware, Packet Filtering, Intrusion Detection System, Network Traffic Behavior.

1. INTRODUCTION

The widespread adoption of broadband and mobile technologies, as well as the boom in internet connectivity, has resulted in a tremendous increase in the number of networked computer systems and storage devices.In response to the evolving threat landscape, packet filtering based on a machine learning model was created to provide protection beyond firewalls and intrusion detection systems.Packet filtering makes analysis of packets that were used to send from one to another and drops that packet if any malicious data or corrupted data found in those packets, if it's found then it drops that packet and blocks that IP address.

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ONLINE VOTING SYSTEM USING CONVOLUTIONAL NEURAL NETWORK (CNN)

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ABSTRACT

An online voting system for indian election is proposed for the first time in this application. The proposed model has a greater security in the sense that voter high security password is confirmed before the vote is accepted in the main database of Election Commission of India. The additional feature of the model is that the voter can confirm if his/her vote has gone to correct candidate party. In this model a person can also vote from outside of his/her allotted constituency or from his/her preferred location. In the proposed system the tallying of the votes will be done automatically, thus saving a huge time and enabling Election Commissioner of India to announce the result within a very short period.

Index Terms:

Election Commission, Online Voting, Security, Indian Constituency, Convolutional Neural Network.

1. INTRODUCTION

Online voting system is a way that helps public to select their representatives and express their preferences for how they will be governed. The belief of the election process is utmost important. Election process is secure if anything goes wrong in Elections the system will increase the security levels. But there is a chance for Maoist attacks and rigging problems in some areas, there is a chance to lose their voteand life. So public needs a more secure way of casting their vote. Online voting systems offer advantages compared to other voting processes. An Online voting system may be involved in any one of a number of steps in the setup, voting, collecting, distributing and counting of ballots. The question of who gets to count your vote was addressed in while in the voting security has been analyzed.

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Double Encrypted File Storage in Cloud using Cryptography

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ABSTRACT

Nowadays cloud computing is used in many areas like industry, military colleges etc. to store huge amounts of data. We can retrieve data from the cloud on request of the user and expect to safely store data into the cloud, by parting information into a few pieces and putting away pieces of it on cloud in a way that information privacy, respectability and guarantees accessibility. Guaranteeing the security of distributed computing is a central point in the distributed computing climate, as clients regularly store delicate data with distributed storage suppliers, however these suppliers might be untrusted. So sharing information in a secure way while safeguarding information from an untrusted cloud is as yet a difficult issue. This technique guarantees the security and protection of customer touchy data by putting away information across single cloud, utilizing AES, Triple DES and Blowfish calculation.

Index Terms:

Data Privacy, Advanced Encryption Standard (AES), Data Encryption Standard (DES), Blowfish Algorithm, Distributed Computing.

1. INTRODUCTION

Nowadays cloud computing is used in lots of regions like industry, navy faculties and so forth to shop large quantities of information. We can retrieve information from the cloud on request of the person. Specifically sharing statistics files at the cloud becomes a weight at the statistics owner because the modern machine develops (the doorway blessings increment in quantity) in addition to the doorway barriers emerge as greater tricky due to an enlargement with inside the affectability of the report fragments. A minor association consists of the statistics owner to make use of public key encryption. This association could require the statistics owner to scramble a comparable element of the statistics report as soon as for each statistics patron being allowed admittance at that factor switch the following code writings to the cloud.

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NO ACCESS

Efficiency evaluation of HRF mechanism on EDoS attacks in cloud computing services

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ABOUT

Abstract

The conventional DDoS assaults can be transformed into an economic denial of sustainability (EDoS) assaults because of elasticity in the cloud services. This EDoS attacks use the cloud assets for creating administration inaccessibility to the clients. There is a mandate to diminish EDoS assaults. HRF is the most suitable and an effective mechanism to identify and diminish such assaults, in which assailant requests are recognised and dropped preceding arriving at the web server. This paper assesses and examines the cost and performance sway using queuing theory and assess experimental model in terms of key performance metrics which incorporate QoS and cost metrics. Different scenarios appropriate to HRF mechanism are taken into consideration and examined. Performance is compared with existing approaches using game theoretical methodology. To get the systematic solution and calculation of game value, various probabilities of defending techniques and assaulting strategies through numerical outlines are done. Lastly conclusions are drawn.

Keywords

HRF mechanism' queuing theory, game theory, web application firewalls, WAFs, EDoS attacks, distributed denial of service, DDoS, economic denial of sustainability, EDoS

Previous Article

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Prediction of Effects Caused by Genetically Modified Food on Child Health and Controlling Mechanism

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Abstract. Genetically Modified Food (GMF) is a word that became buzz nowadays in both food production and environmental effects. The people are more concerned about the short-term and long-term health problems that are been caused by gene technology that is genetically modification of food. Many studies are been carried out to know the advantages and disadvantages of GMF. In this paper, the effects caused by genetically modified food on human health, prediction of risks that will occur based on historic data, controlling mechanisms and also about the benefits of non-GM over biomagnified food are discussed. In this paper multinomial Naive Bayes classifier and to classify and predict the effects caused by GMF support vector machines are used.

Keyword: Genetically Modified Food, Food Production, Effects, Gene Technology, SVM, Biomagnified.

1. Introduction

GMF stand for genetically modified food. It is formed by the adding of the gene of one organism to the other one. The organism may be a plant, animal, bacteria, or virus. The GM foods are the non-naturally occurring foods. The modification of genes is made to get a high amount of outcome. Let's consider an example of a plant that is modified genetically by acquiring the gene from other organisms like plants or bacteria for high production or yield. The characteristics are carried in the structure of the DNA [9] and not only by add, we can even remove the genes and make a new organism because genes are available in every living thing on the earth. These genes transformation from one species to another species have some advantages and disadvantages.

1.1 GM crops and food

Day by day as the population is growing continuously and the needs of the foodare also increasing, so automatically the demand for growth of food is also increasing. So, the production of food can be done in two ways one by clearing the areas for the production of crops and the other way is to increase the yield of the crop in the areas that are already under irrigation. So, in order

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Artificial Intelligence Methods to understand and improve I

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Abstract

The success of an organization depends on the performance of it ultra-competitive job market, organizations are forced to quic intrinsic and extrinsic factors that concern employees. Organizati depended on various surveys to understand what their workfor different aspects of their employment. Though effective, employee a boilerplate template and often fail to capture the emerging soci Capturing employees' feedback using text allows workers to exp provides excellent insight into the latent themes. This paper framework to understand employee experience using Indeed revie leverage Natural Language Processing techniques such as N-gram analysis, and topic modeling to bring forward latent topics of discuss

1. Introduction:

Organizations and business leaders have always favored data-driven decision-making. The two popular dimensions of data-driven decision-making are the information at hand and the process of generating insights(Provost & Fawcett, 2013).

The process of valuing information has significantly evolved over the years. As the first commercial databases were launched in years 1968, organizations started to think about storing data in a well-organized format(Fry & Sibley, 1976). In the early days, companies limited themselves by only storing the most

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