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3.4.5.3 Total no.of publications in scopus during the year 2022-2023	31
3.4.5.4 Total no.of publications in web of science during the year 2022-2023	2
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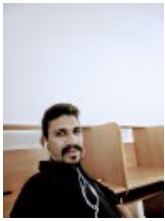
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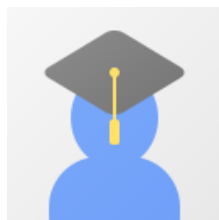
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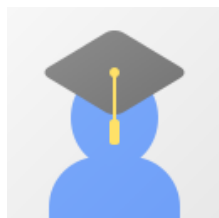
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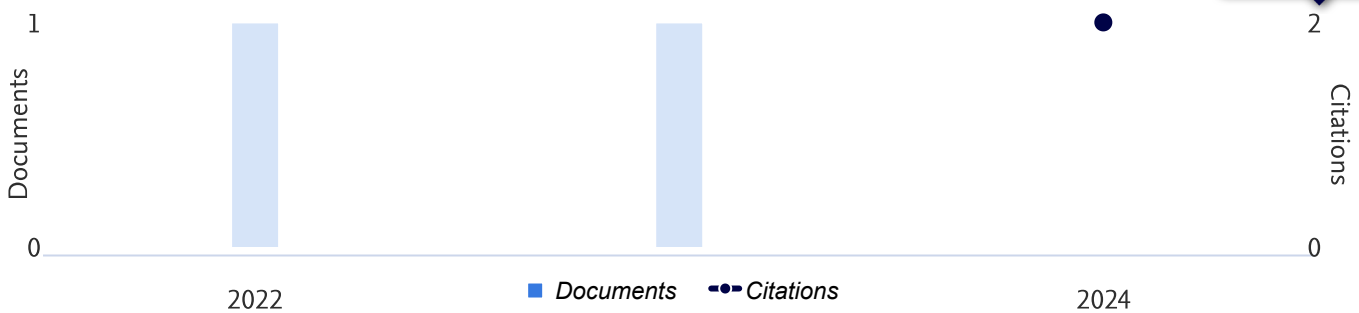


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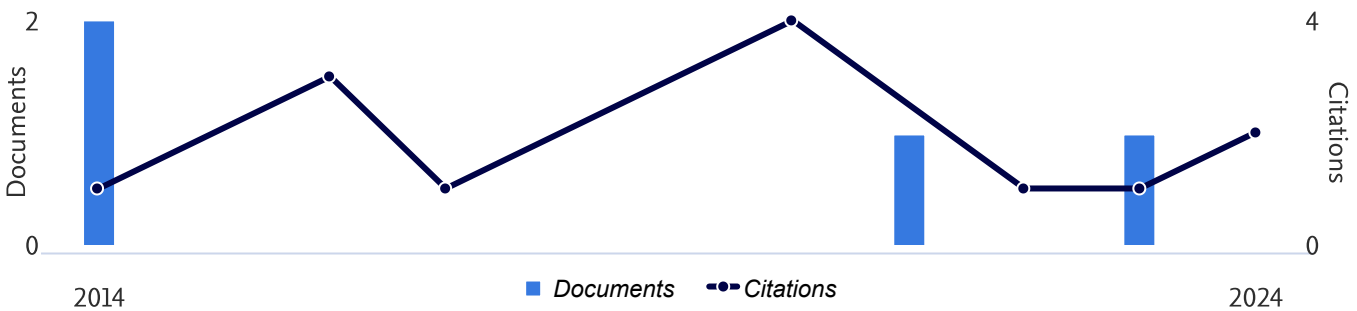


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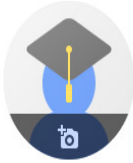
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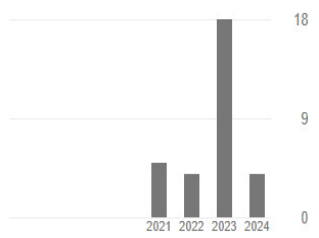
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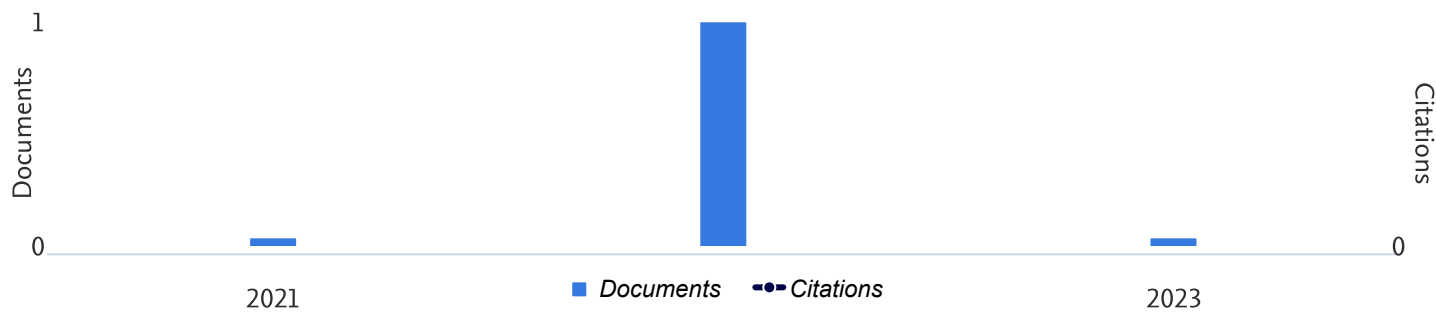
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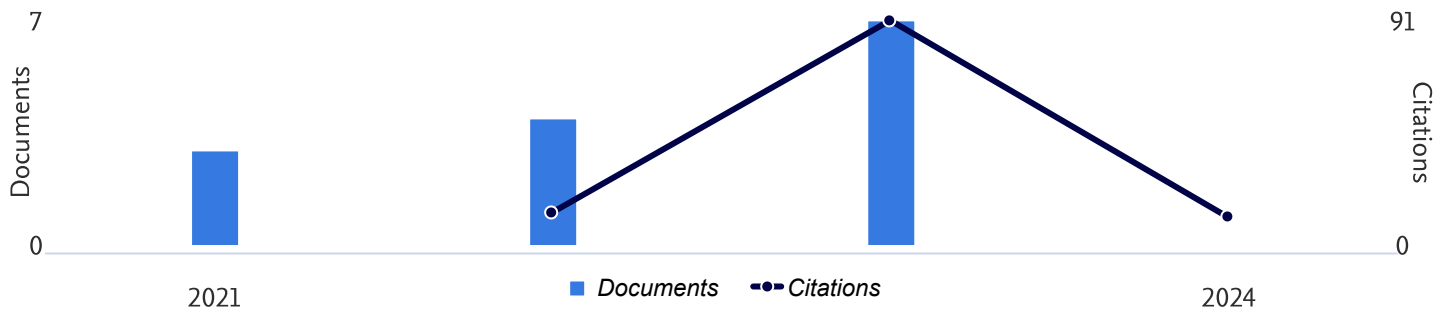


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Analysing the impact of contextual segments on the overall rating in multi-criteria recommender systems

Chinta Venkata Murali Krishna*, G. Appa Rao and S. Anuradha

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Abstract

Depending on the RMSE and sites sharing travel details, enormous reviews have been posted day by day. In order to recognize potential target customers in a quick and effective manner, hotels are necessary to establish a customer recommender system. The data adopted in this study was rendered by the Trip Advisor which permits the customers to rate the hotel on the basis of six criteria such as, Service, Sleep Quality, Value, Location, Cleanliness and Room. This study suggest the multi-criteria recommender system to analyse the impact of contextual segments on the overall rating based on trip type and hotel classes. In this research we have introduced item-item collaborative filtering approach. Here, the adjusted cosine similarity measure is applied to identify the missing value for context in the dataset. For the selection of significant contexts the backward elimination with multi regression algorithm is introduced. The multi-collinearity among predictors is examined on the basis of Variance Inflation Factor (V.I.F). In the experimental scenario, the results are rendered based on hotel class and trip type. The performance of the multiregression model is evaluated by the statistical measures such as R-square, MAE, MSE and RMSE. Along with this, the ANOVA study is conducted for different hotel classes and trip types under 2, 3, 4 and 5 star hotel classes.

Keywords: Recommender system, Collaborative filtering, Hotel classes, Trip types and backward elimination

Introduction

The tourism industry plays a major role for the growth of country's economy. In order to scatter the tourism information the internet plays a major role in most of the countries. Currently everyone wishes to energize themselves in the vacation by visiting the locations all around the globe in the categories of middle and upper sections of users [1]. Once in a year the users plan their vacations due to an increase in socioeconomic factors. To fulfil their aspirations online travel platform is one of the great opportunity. To resolve the information overload issue, the recommender system was introduced to help the users by analysing the user preference information [2]. Based on recommendation approach the recommender systems can be categorised in to content-based, collaborative filtering (knowledge-based), and hybrid [3, 4]. The content based recommendation

Detecting Fake Faces In Smart Cities Security Surveillance Using Image Recognition And Convolutional Neural Networks

Daya Sagar K.V.¹, Dr.DBK Kamesh², T. Srinivasa Rao³ and Chinta Venkata Murali Krishna²

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ECS Transactions, Volume 107, Number 1


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Smart cities are planned to have millions of Internet-connected sensors and devices. Sensors can create a huge amount of data in a range of applications. In modern urban environments, quality of life in a Smart City is heavily dependent on the safety of its residents. For a long time, public safety has been a major source of anxiety. For everyone, stopping a breach of private space security has become a priority. Traditional security systems raise an alarm whenever they detect a breach of safety. It is possible to find a breach of an advanced model by using image processing and a deep analysis of convolutional neural networks to classify images. Because of the ability to reduce complicated aspects from photographs using exact algorithms for facial and body detection. The results of specific machine learning, such as deep learning techniques are outstanding. The processing time of the proposed system is reduced, and true rate of face recognition is 72.7% under varying distance from 2m to 5m. This paper aims to show that when used together the security sector, the two can achieve more than might have been previously assumed models.

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Application virtualization platforms are virtualization technologies that allow applications to run independently. It is observed that applications running on application virtualization platforms may have abnormal working conditions from time to time. However, such situations can be caught by system administrators examining the application log files in detail. This causes abnormal operating conditions to be captured long after they occur. Within the scope of this research, a method that allows to detect abnormal running conditions of applications running on application virtualization platforms in real time is proposed. The proposed method uses both unsupervised learning and supervised learning algorithms together. A prototype application was developed to demonstrate the usability of the proposed method. In order to demonstrate the success of the method, the tests we performed on the prototype yielded high accuracy in a real-time detection of abnormal operating conditions.

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Abstract

The revenue and economy of the country in the past years significantly depend on tourism. The hotel sector's role is even more prominent in tourism. The plans and decisions of tours of users can be recommended with the collaboration of E-commerce and hotel management. The traveling proportion of the population is getting minor over the months due to the worst impact of COVID-19. Thus not just the tourism, the hotel sector is also in vain in terms of revenue. Users' past experiences and opinions help boost their satisfaction levels by providing recommendations and retaining them. The present scenario and stats prove that the selection and decision of hotels have enormous support on user reviews. This research article tries to find and analyze the various aspects that contribute more towards the gratification levels of users in Indian top tourism city hotels listed by the Master and VISA Inc. survey. This survey focuses on the item-item collaborative filtering and regression techniques based on TripAdvisor reviews of recent times. Once the dimensions are known, it helps in improving them and thus even enhances the ratings of Asian continental hotel management. This study proves that the online travel platform helps obtain reviews from users to maintain the travel recommender systems.

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A Novel Deep Convolutional Neural Network for Diagnosis of Skin Disease

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ABSTRACT

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Keywords:

image processing, deep convolutional neural network, skin images, skin diseases, melanoma and carcinoma

Due to its intricacy, dermatology presents the most challenging and uncertain terrain for diagnosis. Skin conditions like Carcinoma and Melanoma are frequently very challenging to identify in the early stages and are much more challenging to define independently. The use of pattern recognition models to automate detection has been studied by a number of writers. This research describes a novel Deep Convolutional Neural Network (DCNN) for Skin Disease Detection. The photographs of skin would undergo processing to remove unwanted noise as well as to improve the photos. The performance of classification will be greatly impacted by the pixel values of a picture. The picture is classified using the softmax classifier method by feature extraction utilising DCCN, and a diagnosis report is produced as the result. In comparison to more classic approaches like KNN (K-Nearest Neighbour) and CNN, this methodology will provide results faster and with improved accuracy, precision, and recall. With a detection time of 10,000 milliseconds, DCNN achieved accuracy, precision, and recall percentages of 98.4%, 96.3%, and 97.2%, respectively.

1. INTRODUCTION

About 10 to 12% of the Indian population suffers from skin problems [1]. In the same way that the skin protects the body and takes in sensory input from the environment, the largest organ in the human body, the skin is made up of seven layers of ectodermic tissue and protects the muscles, internal organs, and skin.

Increased population, harmful UV (Ultra-Violet) rays, poor hygiene, and global warming are the factors that stimulate skin disease. Dermatological conditions are among the most common illnesses in the world [2].

Due to the scarcity of dermatological specialists, complexity, and variation, dermatological disorders are excellent hard terrains for quick, accurate diagnosis in both developed and developing nations [3].

Additionally, it is well known that in many circumstances, early identification lowers the likelihood of serious results. The most recent environmental conditions, however, simply serve as a trigger for some skin illnesses. When conditions like melanoma, psoriasis, eczema, and herpes are discovered in their early stages, a person's life is saved from imminent risk.

Skin infections are considered to be more fundamental in most diseases and risk factors for the majority of malignancies [4]. There are many different skin problems that can afflict people. These conditions can be recognised and diagnosed by their symptoms, and they can all be treated effectively by a

skin expert. In the past, a pathologist would perform a prognostic study on the affected skin area in order to classify the skin infection.

Biopsies are used to carry out the process, which may involve removing the afflicted skin area and sending it for testing at a lab to determine whether cancer is present. Histopathology can be performed on a sample of skin to grade the diseases and determine the most appropriate course of treatment for infections of the later classified as appropriate categories.

An inconsistent education in dermatology at the undergraduate level, which is typically prohibited, suggests that students need to re-evaluate their present knowledge and abilities in this particular area. Nearly 90% of skin conditions are now only treated by primary care. This would imply that many questions about skin problems might have answers if care were to be taken at an earlier time.

The quality of life for people with skin conditions may be considerably impacted. As prevalence of skin problems have increased, earlier stage detection is becoming more important for successful treatment. Early identification of skin conditions is crucial, and general practitioners (GP) play a key role in this [5]. There are several initiatives for integrating traditional medicine across the world, especially in less technologically developed nations where attempts are made to overcome challenges including the absence of affordable medical tools and equipment and medical competence.



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Road maintenance is one of the most critical issues confronting agricultural based countries. Road foundations are vital to society since most traffic accidents are caused by poor road conditions such as potholes. Potholes are caused by poor quality and a failure to keep up with the roadways. Furthermore, the continuous rise of overweight vehicles, such as trucks, are responsible for the potholed roads. These poor quality roads will extremely damage the automobiles in terms of underinflated tires and accidents. Hence, a A suitable structure for monitoring road conditions and planning future works should be developed. Pits are generally formed by mature roadways and poor road support structures, and their number grows with time. Potholes compromise road safety and reduce transportation efficiency. This research study proposes a portable framework called PotholeEye + to consequently observe the outer layer of a road and progressively distinguish asphalt problems through video investigation. As you drive the road director, PotholeEye+ pre-processes the images, removes the inclusion and sort out the misery. This research work is testing PotholeEye+ on a real road constantly for a year by using original settings, a camera, a small-scale PC, a beneficiary GPS, etc. Subsequently, PotholeEye + has recognized asphalt problems with 92% typical accuracy, 87% accuracy and 74% review when driving at a typical speed of 110 km/h on an actual highway.

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S. Phani Praveen , T. Bala Murali Krishna, C. H. Anuradha, Srinivasa Rao Mandalapu, Pappula Sarala & S. Sindhura

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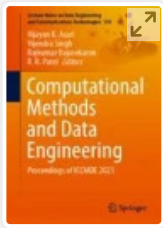


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ABSTRACT

Confidentiality and security breaches remain significant concerns for electronic healthcare systems even though many relevant rules, principles, and compliance standards are in place to protect health information. It is now essential to use strategies revolving around big data to enhance the dependability of healthcare delivery due to the ever-increasing number of data generated within the healthcare sector. Even though big data processing methods and platforms have been incorporated into the data management designs for medical systems, these designs have trouble addressing urgent situations. Today, it is difficult to predict how big data and ML will affect the healthcare sectors. As a result, a clinical healthcare data warehouse environment utilizing big data analytics and ML is provided in this analysis. Quick digital access to all types of data, including patient histories, scan records, insurance claims, and payment history, is

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Distributed Computing Meets Movable Wireless Communications in Next Generation Mobile Communication Networks (NGMCN)

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Abstract

Distributed technology will have a significant influence on wireless communications on the move in next generation cellular networks. On the one hand, portable distributed computing (PDC) solutions are enabled by the integration of distributed computing into the mobile platform. The distributed powerful computing platforms for radio access networks, on the other hand, have given rise to a unique notion of distributed radio admittance web (D-RAW). In this

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Abstract

Nowadays, in most countries, the most dangerous and life threatening infection is Chronic Kidney Disease (CKD). A progressive malfunctioning of the kidneys and less effectiveness of the kidney are considered CKD. CKD can be a life threatening disease if it continues for longer period of time. Prediction of chronic disease in early stage is very crucial so that sustainable care of the patient is taken to prevent menacing situations. Most of the developing countries are being affected by this deadly disease and treatment applied for this disease is also very expensive, here in this paper, a Machine Learning (ML)-positioned approach called Neuro-Fuzzy model is used for prediction belonging to CKD. Based on the image processing technique, fibrosis proportions are detected in the kidney tissues. It also builds a system for identifying and detection of CKD at an early stage. Neuro-Fuzzy model is based on ML which can detect risk of CKD patients. Compared with other conventional methods such as Support Vector Machine (SVM) and K-Nearest Neighbor (KNN), the proposed method of this paper — ML-based Neuro-Fuzzy logic method — obtained 97% accuracy in CKD prediction. This method can be evaluated based on various parameters such as Precision, Accuracy, Recall and F1-Score in CKD prediction. From the results, the patients having high risk of chronic disease can be predicted.

Keywords: Machine learning ▪ chronic kidney disease (CKD) ▪ Neuro-Fuzzy algorithm ▪ random forest ▪ fibrosis conditions ▪ CKD stage identification

We recommend

Linear fusion approach to convolutional neural networks for facial emotion recognition

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ABSTRACT

Facial expression recognition is a challenging problem in the scientific field of computer vision. Several face expression recognition (FER) algorithms are proposed in the field of machine learning, and deep learning to extract expression knowledge from facial representations. Even though numerous algorithms have been examined, several issues like lighting changes, rotations and occlusions. We present an efficient approach to enhance recognition accuracy in this study, advocates transfer learning to fine-tune the parameters of the pre-trained model (VGG19 model) and non-pre-trained model convolutional neural networks (CNNs) for the task of image classification. The VGG19 network and convolutional network derive two channels of expression related characteristics from the facial grayscale images. The linear fusion algorithm calculates the class by taking an average of each classification decision on training samples of both channels. Final recognition is calculated using convolution neural network architecture followed by a softmax classifier. Seven basic facial emotions (BEs): happiness, surprise, anger, sadness, fear, disgust, and neutral facial expressions can be recognized by the proposed algorithm. The average accuracies for standard data set's "CK+," and "JAFPE," 98.3% and 92.4%, respectively. Using a deep network with one channel, the proposed algorithm can achieve well comparable performance.

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1. INTRODUCTION

Emotional expressions are the most important as it encodes non-verbal ways of expressing interior emotions and intentions. The facial action coding system (FACS) is a suitable structure that uses action units (AU) to identify human facial behavior on the face [1]. Multifarious methods confide in the extraction of the facial region [2] or an automatic solution to identification [3]. Primary facial recognition extraction methods include local directional pattern (LDP), linear discriminant analysis (LDA), local binary patterns (LBP), principal component analysis (PCA), and convolutional neural networks [4]. AUs are core indicators, making a declaration about the correspondent emotion activation point [5], [6]. AUs may not only be utilized to reveal emotions and textures. When the face reveals emotion and multiple filters can be applied for the exposure of facial emotions Convolutional neural networks are specific kinds of artificial neural networks and have been working with reasonable performance as a feature extractor [7]. Facial expression identification typically requires three phases of preparation consisting of the acquisition of the face, the retrieval of the features, and the classifier [8]. Despite recent rapid advances, facial emotion recognition (FER) remains difficult due to a variety of challenges such as improvements in lighting and accessories,

Performance Study of Lead-Free Mixed Halide $\text{Cs}_2\text{TiI}_{6-x}\text{Br}_x$ (where $x = 1$ to 5) Based Perovskite Solar Cell

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The present research work represents the study of device modelling and simulation of lead-free cesium titanium (IV) mixed halide ($\text{Cs}_2\text{TiI}_{6-x}\text{Br}_x$, where $x = 1$ to 5) based perovskite active layer. The active layer thickness, operating temperature and defect density are optimized for photovoltaic performance using SCAPS-1D (Solar Cell Capacitance Simulator – 1 Dimension) device simulator. The validity of the selection of appropriate physical and basic parameters for the proposed solar cell with cell architecture $\text{FTO}/\text{TiO}_2/\text{Cs}_2\text{TiI}_{6-x}\text{Br}_x/\text{CuSCN}/\text{Ag}$ was used for the study. The optimum cell performance of the proposed device was studied for different thicknesses of the active layer, device temperature and defect density of active materials. The numerical study using SCAPS-1D revealed optimum device performance for the thickness of perovskite materials $\text{Cs}_2\text{TiI}_5\text{Br}$, $\text{Cs}_2\text{TiI}_4\text{Br}_2$, $\text{Cs}_2\text{TiI}_3\text{Br}_3$, $\text{Cs}_2\text{TiI}_2\text{Br}_4$, $\text{Cs}_2\text{TiI}_1\text{Br}_5$ at 1.0, 1.0, 0.4, 0.4, and 0.4 μm , respectively. The optimum device performance at temperatures of 10, 10, 20, 20, and 20 °C was numerically simulated for $\text{Cs}_2\text{TiI}_5\text{Br}$, $\text{Cs}_2\text{TiI}_4\text{Br}_2$, $\text{Cs}_2\text{TiI}_3\text{Br}_3$, $\text{Cs}_2\text{TiI}_2\text{Br}_4$, and $\text{Cs}_2\text{TiI}_1\text{Br}_5$ perovskite materials, respectively. The optimized defect density for all seven perovskite materials was found to be at 10^{10} cm^{-3} . The device has time of response of 1.27 μs for $\text{Cs}_2\text{TiI}_2\text{Br}_4$, $\text{Cs}_2\text{TiI}_3\text{Br}_3$, $\text{Cs}_2\text{TiI}_4\text{Br}_2$, and $\text{Cs}_2\text{TiI}_5\text{Br}$ absorbing layers and 1.18 μs for the $\text{Cs}_2\text{TiI}_1\text{Br}_5$ absorbing layer-based device.

Keywords: Mixed halide, Perovskite, EQE, ISA, SCAPS-1D, Photovoltaic.

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1. INTRODUCTION

The solar energy is the most effective renewable energy resource in a tropical country like India. Photovoltaic has witnessed tremendous development recently due to the discovery of new materials. Perovskite have created a huge interest among the researchers due to their unique photovoltaic properties, viz. its highly suitable optoelectronic, physical, mechanical and electrical properties like direct band gap, large charge carrier mobility, higher optical absorption coefficient and higher diffusion length makes it an ideal material for photovoltaic application [1-3]. But, due to its low shelf life and use of lead (Pb) have brought up new challenges [4-6]. The development of inorganic lead-free perovskite has created a new hope in the researchers as these materials overcome the past challenges of organic-inorganic lead-based perovskite materials [7-9]. Titanium (Ti) is an earth abundant less toxic element, and it could be a contender of replacing Pb in the perovskite structure. Ju et al. (2018) first observed, 1.0-1.8 eV tunable band gap in the cesium titanium (IV) halide perovskite materials [6]. Later, Chen et al. (2018) achieved 3.28 % power conversion efficiency (PCE) with Cs_2TiBr_6 absorbing material in the $\text{FTO}/\text{TiO}_2/\text{Cs}_2\text{TiBr}_6/\text{P3HT}/\text{Au}$ structure [7]. Chakraborty et al. (2019) in their earlier study showed the performance of Cs_2TiBr_6 , Cs_2TiI_6 , Cs_2TiCl_6 , Cs_2TiF_6 materials in a $\text{CdS}/\text{Cs}_2\text{TiX}_6/\text{CuSCN}/\text{Si}$ based device structure through SCAPS-1D simulation technique [9].

The cesium titanium (IV) mixed halide perovskites are one of the best contenders for future perovskite photovoltaic device material. Thus, a detailed study of these class of materials having mixed halide perovskite ($\text{Cs}_2\text{TiI}_{6-x}\text{Br}_x$, where $x = 1$ to 5) is need of the hour. The present manuscript reports the numerical study for the best photovoltaic performance for optimum conditions of active layer thickness, device temperature and defect density of $\text{Cs}_2\text{TiI}_{6-x}\text{Br}_x$ perovskite material. Further, we have also studied the physical properties of the perovskite materials by the small signal impedance analysis. Impedance Spectroscopy Analysis (ISA) was than implemented using this 1D simulator to study the various physical properties like impedance (Z), capacitance (C) and conductivity (G) of the active materials were also studied. Optical properties of the materials were further investigated to discuss its absorption efficiency, direct and indirect band gap through the Tauc plot.

2. DEVICE STRUCTURE AND SIMULATION

A schematic representation of the proposed photovoltaic device $\text{FTO}/\text{TiO}_2/\text{Cs}_2\text{TiI}_{6-x}\text{Br}_x/\text{CuSCN}/\text{Ag}$ is shown in Fig. 1. SCAPS-1D (Solar Cell Capacitance Simulator – 1 Dimension) software version 3.3.03 was used for the simulation. Physical parameters can be optimized through this software having a maximum of seven-layer device architecture. The effect of physical parameters viz. active layer thickness, device tempera-

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Numerical Analysis of Performance of Various ETL Materials for Cesium Titanium (IV) Single Halide Based PSCs

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Lead-free perovskite solar cells (PSCs) appear to be a great contender of thin film based photovoltaic (PV) technology as they solve two prime issues, toxicity and stability. Ti-based PSCs can be imperative in a high-performance PV device. The external quantum efficiency (EQE) or classical efficiency is often used to measure the optical performance of the solar cell device. This work has a scope in optimizing ETL/HTL and other interfaces to obtain the most efficient $\text{Cs}_2\text{TiI}_{6-x}\text{Br}_x$ PSC, and enhancement in J_{sc} will increase the Shockley-Read-Hall (SRH) recombination. In such circumstances, selection and optimization of electron transport layers (ETLs) and hole transport layers (HTLs) materials are the major factor to be considered effectively to achieve optimum PV performance. Among all ETLs, TiO_2 is found to be the most suitable ETL for our proposed FTO/ETLs/ Cs_2TiX_6 /HTL/Ag based *n-i-p* structured PSCs. The optimum thickness of ETL should be 150-200 nm and of HTL – 10-20 nm, with the following optimized PV performance: $V_{oc} = 1.23$ V, $J_{sc} = 19.378$ mA/cm², PCE = 14.537 % (Cs_2TiBr_6); $V_{oc} = 1.09$ V, $J_{sc} = 23.213$ mA/cm², PCE = 17.452 % (Cs_2TiI_6); $V_{oc} = 1.53$ V, $J_{sc} = 16.822$ mA/cm², PCE = 12.578 % (Cs_2TiF_6) and $V_{oc} = 8.53$ V, $J_{sc} = 10.079$ mA/cm², PCE = 7.348 % (Cs_2TiCl_6). Thus, a detailed study of this class of materials containing halide perovskite is need of the hour.

Keywords: Halide, Perovskite, SCAPS-1D, Photovoltaic, PCE.

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1. INTRODUCTION

Global GDP is increasing at 3.25 % per year and the global population will reach to 9.2 billion by 2040. Higher living standard causes increase in energy demand. Economies of the developing nation's account for above 80 % expansion in world's output. As with GDP growth, the vast majority of this increase stems from increasing prosperity, people move from low to middle income group, allowing them to increase substantially their per capita energy consumption. The overall growth in energy demand is materially offset by declines in energy intensity (energy used per unit of GDP). Third-generation thin film based solar cell like Perovskite solar cell (PSC) has great potential in the Photovoltaic (PV) technology due to its simple fabrication process and lower manufacturing cost [1]. But for the commercialization of PSC, it must meet certain aspects related to the challenges and standards which are mainly stability, hysteresis, and device structure during the manufacturing of the device. A typical PSC employed organic-inorganic hybrid halide material (MAPbX_3 and FAPbX_3) as active material [2-4]. The power conversion efficiency (PCE) of such device has increased from 3.8 % in 2009 to 25 % in 2020 [5, 6]. Despite of having such advantages, organic-inorganic hybrid active material has three major concerns such as lower shelf life, stability and toxicity. These issues can be overcome through the Pb-free PSCs [7-11]. Ahmed et al. made a theoretical predication using $\text{TiO}_2/\text{Cs}_2\text{TiBr}_6$ structure PSC and achieved 11.9 % PCE

[12]. Ju et al. made both experimental as well as theoretical study on earth abundant Ti-based Cs_2TiX_6 based PSC with the 1.0 to 1.8 eV tunable band gap exhibits double Perovskite structure [13]. Chen et al. with his experimental study showed Cs_2TiBr_6 PSC has great potential of PV performance with 1.8 eV band gap [14]. Nitin et al. showed a numerical simulation study about impact of various electron transport layers (ETLs), hole transport layers (HTLs) materials on the PV performance of the device [15].

In this work, we have proposed a FTO/ETLs/ Cs_2TiX_6 (X = Br, I, F and Cl)/HTL/Ag based *n-i-p* PSC structure to select a suitable pair of ETL/absorber and absorber/HTL which has higher photovoltaic performance, followed by optimization of ETL, HTL material using the SCAPS 1D-3.3.2.0 simulator.

2. SIMULATION

The proposed 1D *n-i-p* planar device structure comprises FTO/ETLs/ Cs_2TiX_6 /HTL/Ag has been studied under the ambient condition using the SCAPS simulator and which was illustrated in the Fig. 1a. In this heterojunction structure we have used five different *n*-region ETLs *n*- WO_3 , *n*- TiO_2 , *n*- SnO_2 , *n*- ZnO , *n*- CdS ; four different *i*-region absorbing layer *i*- Cs_2TiBr_6 , *i*- Cs_2TiI_6 , *i*- Cs_2TiF_6 , *i*- Cs_2TiCl_6 ; and one *p*-region *p*-HTL material CuSCN . To validate our simulation result with the experimental result we have taken the various device parameters value from the literature [16-20]. The details of the various parameters viz. thickness, E_g

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Investigation of Radio Channel Characterization in Terahertz Range

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To determine the performance of a wireless system, channel characterization must be carried out. In fact, in a wireless system, the propagation of an electromagnetic wave in space is of particular importance. For this reason, it is necessary to study the correctness of this channel before starting to work on it and implementing it in a communication system. It is therefore essential to have knowledge of the mechanisms involved in the propagation channel and of its interactions with the environment in order to be able to predict the chances and conditions for establishing a radio link between a transmitter and a receiver. In this work, we propose some strategies to model the transmission channel in the THz band. Indeed, before we can evaluate a transition system over wireless system, we have to model the propagation channel. First, we present the main tools allowing the modelling of the channel in the THz frequency range, which is considered a key new technology to meet the growing demand for higher speed wireless communications, as well as its impact on radio systems. In this paper, we propose a channel model for a wireless system working in the THz band. Besides, we propose some strategies to model the entire system as well as the propagation channel. We also simulate the proposed channel model. The simulation results show that the proposed system can be considered as an example for evaluating the performance of a communication chain based on a wireless system in the THz bands.

Keywords: Terahertz, Radio channel, Modulation, Impulse response, Spencer's model, LOS, NLOS.

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1. INTRODUCTION

In a world where communication requires faster and faster data transmission, researchers are working on the implementation of techniques and systems capable of transmit high bit rates. In order to achieve and transmit this broadband, it is necessary to increase the frequency that carries the information. For this, scientists are interested in the terahertz (THz) domain which, thanks to its high frequencies between 0.1 THz and 30 THz, provides the ability to increase the throughput. Indeed, the transmission of bit rates of the order of Tbits / s is potentially possible with THz waves, which is advantageous for an application in communication [1]. Since the THz beam is more diffracting [2] and less attenuated by dry and non-metallic objects than infrared, it is of interest for wireless communication indoors. However, the big difficulty is on the one hand to manufacture compact sources, powerful, and inexpensive, and on the other hand THz-sensitive, integrable and robust detectors. The current challenge in the field of telecommunications is to ensure an increase in transmission rates. For this, several techniques are considered, including the rise in frequency towards the millimeter wave spectrum (Terahertz frequency bands). This approach is the basis of this contribution which presents the results of the characterization and statistical modeling of the THz propagation channel [3-7]. A radioelectric transmission system makes it possible to transform an electrical signal emitted $x(t)$ into an electrical signal received $y(t)$ by means of electromagnetic waves OEM. The propagation channel is the transmission medium that carries the electromagnetic waves during their propagation. Generally, this propagation

medium has an influence on the electromagnetic wave emitted and will depend on the presence or absence of obstacles in this environment. So, to model the THz channel many parameters must be taking into account in order to drop a valuable model for this environment. In alternative transmission systems with orthogonal frequency division multiplexing (OFDM) [8-11], equalizers are used in the frequency domain based on the use of the fast Fourier transform (FFT), which, with the same error probability, have less complexity. But this method has two significant drawbacks: high signal crest factor and high sensitivity to carrier frequency deviation. This leads to a decrease in the efficiency of power amplifiers and an increase in the complexity and cost of radio equipment in general. Wireless communication in a difficult environment such as an industrial environment requires in-depth study of the propagation channel in order to be able to predict the quality and reliability of radio links. Communication in the THz band will alleviate the spectrum scarcity and capacity limitations of current wireless systems and enable new applications in both classical networking domains as well as new nanoscale communication paradigms.

The study of propagation channel in industrial environment will make it possible to propose strategies of emission/reception of data that makes the exchange of information as reliable as possible. Many researchers have carried out works on the modelling of the THz channel. In [12], authors proposed MB-OOK transceiver design for terahertz bands. Elghzaoui et al. has proposed in [13] multiband on-off keying pulse modulation with noncoherent receiver for THz wireless communication system. In order to propose a reliable model of wireless communication for the smart factory, we will

The results were presented at the 2nd International Conference on Innovative Research in Renewable Energy Technologies (IRRET-2022)

A Flower-Shaped Quad-Port Dual-Band MIMO Antenna of 29/39 GHz Millimeter-Wave for 5G Applications

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This research presents a flower-shaped design of a multi-input multi-output (MIMO) antenna with dual wide operating bands in the millimeter-wave (MMW) region proposed for 5G applications. The antenna system consists of a quad-port antenna array placed with a 90-degree shift; it was etched on a low-cost FR-4 dielectric substrate with a full size of $22 \times 22 \times 1$ mm³. The objective of this work is to enhance the bandwidth of the proposed MIMO antenna as well as to increase the antenna gain. To increase the gain, we used multiple single antennas and to enhance the bandwidth we added some slots to the suggested antennas. The array antennas are designed to provide dual-band operation at the frequencies of 29 GHz (n257) and 39 GHz (n259). The results are simulated using HFSS, acceptable gain reaches 3.04 dB and 8.11 dB in the first and second bands, respectively, while the impedance bandwidth achieved by the design is about 1600 MHz (28.9-30.5 GHz) at 29.8 GHz and about 2330 MHz (38.43-40.76 GHz) at 39.6 GHz with a reflection coefficient S_{11} of about -16.20 dB and -19.27 dB, respectively. The proposed antenna can be a desire choice for 5G applications because of its low cost, small size, high performance in terms of bandwidth and gain.

Keywords: 5G, MIMO antenna, Dual-band antenna, Peak gain, Bandwidth.

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1. INTRODUCTION

5G has been in development for a few years, and full coverage of this network should be achieved by 2030. The 5G technology is not limited to digital networks, unlike 3G and 4G, it is expected to have impacts in many sectors, for example, video games, with the development of virtual reality, autonomous transport and connected cars, robotics, or telemedicine (remote diagnosis and surgical operations conducted on the other side of the planet via robotic arms) [1]. The 5G network also enables the automation of logistics platforms and large infrastructures such as ports or factories [2]. 5G NR is much more complex as it has to allow a greater download capacity and it will be able to support a greater number of simultaneous connections and its response time will also be shorter than that of previous generations of mobile networks, all that's causing the push for more research about massive MIMO and dual bands antenna for 5G, like the 4-ports hybrid MIMO antenna with an open-ended slot proposed in [3] operates in the two lower frequencies 800 MHz, 2 GHz as well as the MMW frequency 28 GHz. A Quad-Port Dual-Band MIMO Antenna Array for 5G Smartphone Applications proposed in [4] to operating in 3.5 GHz band (3.4-3.6 GHz) and 5 GHz band (4.8-5 GHz) for 5G smartphone applications.

In this paper, we propose a flower-shaped MIMO antenna configuration that operates at two MMW bands 29 GHz and 39 GHz. In fact, for 4G the base stations can use 4×4 arrays, however for 5G technology we can

use up to 64×64 MIMO arrays [5, 6]. Authors in [7] propose a new modulation scheme to support data over 5G application. The proposed method showed its good performance in terms of data rate and consumption. In [8], an array antenna of $18.67 \times 18.26 \times 0.35$ mm³ for 5G application is proposed. This later has a bandwidth of 1.14 GHz along with a gain of 14 dB. In [9] an array antenna working at 28 GHz bands is suggested. The antenna bandwidth is of about 27.56-28.381 GHz with a peak gain of 15.85 dBi. A 2×2 MIMO antenna operating for 5G wireless communications is implemented in [10]. This antenna covers three 5G bands. Aghoutane et al. proposed in [11] an antenna array for 5G application, the proposed antenna showed a good impedance bandwidth but suffer from less gain. In [12] A 2×2 MIMO antenna for 28/38 GHz 5G is carried out. In [13], Njogu et al. have implemented an On-body patch antenna operating at 28 GHz for 5G applications. In [14], An array antenna is tested and analyzed for the 5G mm-wave applications. In [15], A dual band MIMO antenna is proposed over 5G bands. The antenna showed better performance in terms of gain and bandwidth, but it suffers from radiation efficiency. This work consists of 3 steps. First, we start by explaining the work done on the basic single element to generate the dual-band feature in the MMW frequency range. The second part deals with the construction of the MIMO configuration based on the single flower element. Finally, a discussion of the simulated MIMO S-parameters as well as the simulated radiation characteristics.

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MEDIAPIPE CNN BASED PRETRAINED PATIENT BODY POINT IDENTIFICATION FOR UNCOMFORTABLE SLEEP

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1928

Abstract

There exists an enormous amount of data within the internet where the information is travelled from one source to another destination simultaneously, it is almost beyond thought that this data can be analysed and retrieved in the search capability and processed for a specific use. While there exists several commercial systems that have been designed to build and retrieve the data from images and videos using the initial meta-data provided, they much lack in the description of the system. Content-based retrieval (CBIR) systems have the capability to retrieve the existing images based on the visual content but lacks in few parameters. Here we propose a method of retrieving the data from images and videos by estimating the pose of a human. We propose the structure using different algorithms such as human pose estimation algorithm which can estimate the pose of human being from a proposed image further, we estimate the pose by representing in the form of pose lets which could be estimated from body detectors and later we represent the lower dimensional pose-sensitive manifold by embedding an image and finally conclude the work by demonstrating on a real time video retrieval system which can similarly match with the 2-D pose of a human pose of a query. Using Random Forest of K-D Trees to locate nearby inquiries allows for a quick responsiveness. Designers demonstrate that, apart from the query modalities, a low dimensional representation is sufficient for posture retrieval. Second, we demonstrate that by pooling the findings of many human posture estimate methods, accuracy may be greatly enhanced. Using a variety of pose inquiries, the system's efficacy is measured statistically.

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NeuroQuantology 2022; 20(8): 1928-1939

1 Introduction:

The ubiquity of video recording devices has a huge growth in storing the image and video data. This requires processing the data by decoding it and indexing by inputting the data of images and videos concurrently which is termed generally has content-based information retrieval (CBIR). Here the automation is done particularly on the people who have enormous application in identifying them which can be further developed for various business-related implementations such in supervision, archival salvage, etc. Human presence is one of the important concepts

that try to convey some information about a particular person. Here we estimate and demonstrate the importance of them from searching the pose from animages and videos and demonstrate the need to human pose estimation.

There exist various methods [20] that can be used to search images from a database. All instances in the database that are comparable to a designated item in an image are retrieved in response to a query using [19]. The prediction of the image's object labels [24, 55] is another approach that may be utilised to create annotations. The image and video



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Enhancement of Energy Efficiency and Network Lifetime Using Modified MPCT Algorithm in Wireless Sensor Networks

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<https://doi.org/10.1142/S0219265921440126>

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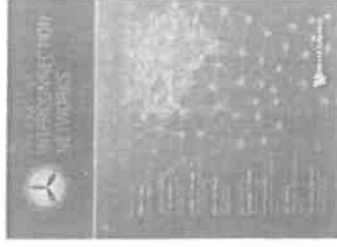
Abstract

Wireless sensor networks (WSN) allude to gathering of spatially fragmented and committed sensors for observing and documenting various physical and climatic

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Application of ANFIS to Grid-tied PV system with APF for Power Quality Enhancement

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3972

Abstract

Generally, electric power system operators have seen photovoltaic (PV) power systems as potential sources of problems due to intermittency and lack of controllability. However, the flexibility of power electronic inverters allows PV to provide grid-friendly features including volt-VAR control, ramp-rate control, high-frequency power curtailment, and event ride-through. Commercially available smart PV inverters can further provide frequency down-regulation by curtailing power, but they are unable to provide true frequency regulation through active power control (APC) because they are unable to increase power on command. A coordinated DC-link voltage control and deloading control for two-stage PV system to offer frequency support in an islanded microgrid without energy storage system (ESS) is implemented. ANFIS based PV inverter control is developed for very fast and accurate control of active power.

Keywords: Photovoltaic (PV) system, Active power filter (APF), ANFIS Controller and Power Quality Technique etc.,

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Introduction:

Power supply and power quality have been critical issues in power system recently. The grid-connected photovoltaic (PV) generator has nowadays become more popular because of its reliable performance and its ability to generate power from clean energy resources. The dc output voltage of PV arrays is connected to a dc/dc boost converter using a maximum power point tracking (MPPT) controller to maximize their produced energy. Then, that converter is linked to a dc/ac voltage source converter (VSC) to let the PV system push electric power to the ac utility. The local load of the PV system can specially be a non-linear load, such as computers, compact fluorescent lamps, and many other home appliances, that requires distorted currents. Development of a means to compensate the distribution system harmonics is equally urgent. In this case, PV generators should provide the utility with distorted compensation capability, which

makes currents injected/absorbed by the utility to be sinusoidal. Therefore, the harmonic compensation function can be realized through flexible control of dc/ac VSC. Instantaneous power theory has successfully completed active power filter (APF) designing with good performance. However, the PV-APF combination has just been gradually developed for several years. This combination is capable of simultaneously compensating power factor, current imbalance, and current harmonics, and also of injecting the energy generated by PV with low total harmonic distortion (THD). Even when there is no energy available from PV, the combination can still operate to enhance the power quality of the utility. To the best of our knowledge, this idea was initiated in 1996 by Kim *et al.*. In this study, the PV system needs energy storage elements, which negatively increase the entire cost. Besides, the mathematical demonstration was not sufficiently provided. After that, the control techniques have been





PV-battery Hybrid system with Multi-Mode Power Converter for Electric Vehicle Charging Station

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3934

Abstract:

As an environmental friendly vehicle, the increasing number of electrical vehicles (EVs) leads to a pressing need of widely distributed charging stations, especially due to the limited on-board battery capacity. However, fast charging stations, especially super-fast charging stations may stress power grid with potential overload at peaking time, sudden power gap and voltage sag. This project discusses the detailed modeling of a multiport converter based EV charging station integrated with PV power generation, and battery energy storage system. In this project, the control scheme and combination of PV power generation, EV charging station, and battery energy storage (BES) provides improved stabilization including power gap balancing, peak shaving and valley filling, and voltage sag compensation. An ANN based controller is designed for regulating performance of multi-mode power converter.

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NeuroQuantology 2022; 20(10): 3934-3940

1. INTRODUCTION

The continuous rise in gasoline prices along with the increased concerns about the pollutions produced by fossil fuel engines are forcing the current vehicle market to find new alternatives to reduce the fossil fuel usage. Along with the research on bio-fuel driven engines; different electric vehicles and hybrid electric vehicles are evolving as viable alternatives to replace, or at least reduce, the current fleet of fossil fuel driven vehicles. Although current manufactured electric/hybrid vehicles are being marketed as a way to reduce fossil fuel usage, several promising technologies are being demonstrated that can utilize power electronics to charge the battery from the utility using plug-in vehicles or act as a distributed resource to send power back to the utility with vehicle-to-grid capabilities. In this paper, different plug-in vehicle topologies are described to review the power electronics required for them. The newly evolving V2G

technology is also discussed along with economics and compliance requirements to allow the vehicle to be connected to the grid. Before going into the details of power electronics required for the electric/hybrid vehicles, the common forms of these vehicles are described next to get accustomed with the terminologies.

2. ELECTRIC VEHICLES

A typical electric vehicle (EV) has a battery pack connected to an electric motor and provides traction power through the use of a transmission. The batteries are charged primarily by a battery charger that receives its power from an external source such as the electrical utility. Also during regenerative braking, the motor acts as a generator which provides power back to the batteries and in the process slows down the vehicle. The primary advantage of an EV is that the design is simple and has a low part count. The primary disadvantage is that the driving range of the





A Powerful and Convenient Bidirectional Battery Charger Controller Designed for Electric Vehicles

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3941

Abstract:

This concept presents EV battery charge management in a power distribution system. For EV safety, new power electronic converter topologies with Inductive Power Transfer (IPT) are employed. For zero current switching, this IPT architecture uses classical series L-C compensation with minimal auxiliary components (ZCS). The suggested architecture provides a consistent output voltage even when the input voltage varies widely. However, the number of active and passive circuit components increases with design complexity. A controlled Bidirectional Battery Charger for EV with Vehicle-to-Grid Capability is suggested to solve this issue. Other key aspects of the suggested charge controller include its active and reactive control in G2V and V2G operation with THD according to international standards, care for battery life time, and smooth power fluctuation in charge and discharge modes. These two EV battery charge controller topologies are confirmed in simulation. Compared to IPT topology, bidirectional converter offers greater advantages.

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NeuroQuantology 2022; 20(10): 3941-3954

INTRODUCTION

Traditional Internal Combustion (IC) engines run on petroleum fuels (petrol, diesel, or LPG). The most urgent answer is to reduce the usage of fossil fuels as much as possible. Moreover, traditional IC engines produce CO₂ and other greenhouse gases, making environmental standards difficult to meet. The solution is to use alternative fuel cars like electric and hybrid electric automobiles (HEV). EV does not produce tailpipe pollutants such particles, ozone, volatile organic compounds, carbon monoxide, hydrocarbons, lead, and oxides of nitrogen. One can also reduce the use of fossil fuels. Moreover, the EV market allows humans to extend transportation life expectancy at a cheaper cost. In the past, EVs' market success was limited by battery and power shaping technologies. However, in recent decades, BT has evolved to be more energy dense, lighter, and more efficient.

Short driving ranges require efficient, quick chargers for human safety. In the current

environment, inductive power transfer (IPT)-based battery charging (BC) systems are used for EV stationary and dynamic charging. Compensation networks are proposed to reduce circuit impedance and increase converter efficiency. However, the number of active and passive circuit components increases with design complexity. The proper solution extends driving range, reduces maintenance, reduces carbon footprint, and saves money. Thus, converter selection is critical to EV market flow. As a result, it expertly assists reducing environmental difficulties caused by transportation.

CC/CV mode charging in [7] requires a complete bridge DC-DC converter with four switch AC-DC converter. These references make the PFC controller's control circuit more complicated. [8] shows a level 2 charger with a bridgeless boost PFC converter and an isolated phase shifted full bridge DC-DC converter. SiC power switches are used to achieve great





Modeling and Control of a SVM based Multiport Converter for EV Charging Station with PV and Battery

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3963

ABSTRACT:

Because of the restricted storage capacity of the batteries found on board electrical vehicles (EVs), there is an urgent need for charging stations to be located in a broad variety of locations. This is especially true given the growing popularity of these eco-friendly automobiles. However, fast charging stations, particularly super-fast charging stations, have the potential to strain the electrical infrastructure by causing an overload during peak hours, a sudden gap in power, and a drop in voltage. This research describes the application and modelling of space vector modulation to multiport converter based electric vehicle (EV) charging station integrated with photovoltaic power generation and battery energy storage system. In this article, the control system and combination of PV power generation, EV charging station, and battery energy storage (BES) provides superior stabilisation. This includes power gap balancing, peak shaving and valley filling, and voltage sag compensation. As a consequence of this, the influence exerted on the power grid is minimised as a result of the matching that occurs between the daily charging demand and enough daytime PV generation. The simulation results are shown to confirm the benefits at different modes of this proposed multiport EV charging circuits with the PV-BES configuration using the SVM approach. In addition, SiC devices are implemented at the electric vehicle charging station in order to further improve the station's efficiency.

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NeuroQuantology 2022; 20(10): 3963-3971

INTRODUCTION

The continuous rise in gasoline prices along with the increased concerns about the pollutions produced by fossil fuel engines are forcing the current vehicle market to find new alternatives to reduce the fossil fuel usage. Along with the research on bio-fuel driven engines; different electric vehicles and hybrid electric vehicles are evolving as viable alternatives to replace, or at least reduce, the current fleet of fossil fuel driven vehicles. Although current manufactured electric/hybrid vehicles are being marketed as a way to reduce fossil fuel usage, several promising technologies are being demonstrated that can utilize power electronics to charge the battery from the

utility using plug-in vehicles or act as a distributed resource to send power back to the utility with vehicle-to-grid capabilities. In this paper, different plug-in vehicle topologies are described to review the power electronics required for them. The newly evolving V2G technology is also discussed along with economics and compliance requirements to allow the vehicle to be connected to the grid. Before going into the details of power electronics required for the electric/hybrid vehicles, the common forms of these vehicles are described next to get accustomed with the terminologies.

Literature View:

Singaravelan and Kowsalya [1] presented fuzzy controller for voltage-





A Novel 31 Level Inverter with Lower DC Voltage Sources in a Distribution Network

3955

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Abstract:

In this paper, a new general cascaded multilevel inverter using developed H-bridges is proposed. The proposed topology requires a lesser number of dc voltage sources and power switches and consists of lower blocking voltage on switches, which results in decreased complexity and total cost of the inverter. These abilities obtained within comparing the proposed topology with the conventional topologies from aforementioned points of view. Moreover, a new algorithm to determine the magnitude of dc voltage sources is proposed. The performance and functional accuracy of the proposed topology using the new algorithm in generating all voltage levels for a 31-level inverter are confirmed by simulation and experimental results

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1. INTRODUCTION

Multilevel-inverters (MLI) are designed for processes that require high Volt-Ampere rating and for applications which desire high power-quality waveforms [1]. Large instantaneous common-mode voltage appears across motor terminals in Pulse Width Modulation (PWM) controlled inverter. Multilevel inverters can overcome this problem as each switching device has low dV/dt per cycle. Also, the efficiency is high as they operate at much lower frequencies than PWM-controlled inverters resulting in lower switching losses. Voltage source inverters like MLI can achieve high voltage with low harmonics.

Different levels of voltage sources are used based on the configuration. Symmetric structure uses all voltage sources of same level, whereas asymmetric structure can use one of the following configurations

Unary configuration

- Binary configuration
- Ternary configuration

Selection of source configuration depends on the topology used and the desired voltage levels. By using Unary configuration we can build a fault tolerant system. On the other hand, by using Binary or Ternary configuration we can achieve higher output levels with optimal number of switching components. When the number of output level rises, the output voltage and current waveform resembles the sinusoidal waveform. Due to high number of levels, the harmonics distortion of output voltage waveform decreases. Lower dV/dt is observed in multilevel inverter as the switching occurs between lower voltage levels when matched to two-level inverter.

In this paper, we present a multilevel inverter to produce 31-level of output, in which the MOSFETs are operated at fundamental frequency [2]. This technique enables the value



Finite Element Method designing of Ionic current density and Electric field for Hybrid Transmission Lines and HVDC

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Abstract—The requirement for renewable energy sources and power is rising, which necessitates the expansion of both the capacities of distribution & transmission. Extra power can be transferred more cheaply when utilizing DC because the RMS and peak voltages are the same, however building new transmission lines is also frequently accompanied by difficult approval processes, competing interests, & higher costs. Therefore, sharing HVDC and HVAC lines on the same tower called hybrid lines is a more economical way to meet the demand. Coronal charges lead to issues like loss of power, loud noise, & interference in radio signals. Additionally, the electromagnetic field beneath the transmission lines at ground level makes people uncomfortable by making a sensation on their hair. Consequently, a systematic analysis of the ion current density, electric field & impact of space charges at ground level is required. This paper uses COMSOL Multiphysics software to calculate the ion current density on the ground & electric field influenced by space charges for hybrid transmission lines & HVDC. Numerous designs in HVDC, including monopolar & bipolar were investigated. For monopolar & bipolar, the effects of wind & ground conductors on space charges were investigated. This paper presents a confirmed HVDC model that may be used to investigate how space charges from DC conductors affect the current density and electric field.

Keywords—Monopolar, COMSOL Multiphysics, FEM analysis, HVDC, Bipolar, Hybrid configuration, Any-pole.

I. INTRODUCTION

The requirement to improve the power transmission capacity has amplified along with the stable rise in the power demand. Governments have struggled to keep up with this rising demand because of constraints including voltage range, conductor, cost, & lack of land for transmission line tower designing. Although HVDC has numerous advantages, including, stability issues, the removal of synchronization & lower costs etc., there is never enough support for the new power lines. Therefore, using hybrid transmission lines is one of the best ways to solve this problem. Hybrid transmission lines combine HVDC with HVAC circuits on the tower. Another method for creating hybrid configurations is to convert existing AC lines to DC. By this, the capacity of the transmission may be expanded without changing the

conductor configurations, which will significantly speed up & lower the cost of designing transmission lines. Hybrid transmission corridors is a term used to describe parallel runs of both HVDC and HVAC circuits that are not greater than 20–30 meters apart[13].

II. CORONA

The ionization of the air surrounding a high voltage conductor is known as “corona”. A corona discharge is a quick rupture of electrons into the environment that creates current pulses at a short time intervals causes the air medium or gas medium around a high voltage conductor to break down near the conductor. When the voltage reaches the crucial value known as the corona onset voltage, where the strength of the electric field becomes greater than the power required to break down air, the process of ionization begins, resulting in the formation of charged ions in the immediate vicinity.

The corona effect is accompanied by a hissing sound, power loss, production of ozone & radio interference.

In this paper, COMSOL Multiphysics software is used to compute the electric field caused by the voltage applied to the conductor. Corona discharge is always restricted to proximity to the conductor because the voltage stress decreases as one shift away from the conductor. The corona inception voltage, which is controlled by the peeks formula, is where corona discharges start. This electric field produced by the applied voltage to the wire is calculated in this paper using the COMSOL software.

Positive and Negative corona are the two types of corona. Negative ions have a somewhat higher mobility than the positive ions created by corona discharge.

A. Corona-related factors:

There are five main elements affecting Corona out of many:

a) *Voltage Applied*: Corona losses and Voltage are directly related to one another. Corona losses are prevented if the corona onset field is larger than the electric field produced by the applied voltage.

22-23 (3)



Radiative Heat Source Fluid Flow of MHD Casson Nanofluid over A Non-Linear Inclined Surface with Soret and Dufour Effects

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ABSTRACT

In this article, the impact of MHD Casson Nanofluid boundary layer flow, over an inclined extending surface with thermal radiation, heat source/sink, Soret and Dufour, is scrutinized. The model used in this study is based on the Buongiorno model of the thermal efficiencies of the fluid flows in the presence of Brownian motion and thermophoresis properties. The non-linear problem for Casson Nanofluid flow over an inclined channel is modeled to gain knowledge on the heat and mass exchange phenomenon, by considering important flow parameters of the intensified boundary layer. The governing non-linear partial differential equations are changed to ordinary differential equations and are afterward illustrated numerically by the homotopy analysis method (HAM). Numerical and graphical results are also presented in tables and graphs. It has been noticed that increasing the inclination parameter reduces the amount of friction experienced by the surface, but it has the opposite effect on the Nusselt number and the Sherwood number. In the concentration field, the inclination parameter reveals a decreasing trend, in contrast to the chemical reaction rate parameter, which reveals an increasing trend in the opposite direction. Likewise, the present results are noticed to be in an excellent agreement with those offered previously by other authors. Finally, some of the physical parameters in this study, which can serve as improvement factors for heat mass transfer and thermophysical characteristics, make nanofluids premium candidates for important future engineering applications.

Keywords:
Casson nanofluid; inclination surface;
Soret; Dufour; heat source; HAM

1. Introduction

In recent times, nanofluid has accomplished an incredible position among scientists because of its dynamic thermal performance and notable potential in the number of heat transfers without any pressure drops. Nanofluid is a formula of various nanoparticles, containing Al_2O_3 , Cu, CuO, in a base liquid, for example, oil, water, ethylene glycol, and so forth. It is investigated through examination that the thermal conductivity of base fluid is usually not exactly the same as the nanofluid, Choi and Eastman [1]. Nanofluid is used as a working fluid (base fluid) due to its high thermal conductivity.

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An efficient zinc acetate dihydrate-catalyzed green protocol for the synthesis of 2,3-dihydroquinazolin-4(1H)-ones

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Abstract: By condensation from substituted carbonyl compounds and anthranilamide under toluene reflux conditions, a wide range of 2,3-dihydroquinazolin-4(1H)-ones were produced in fair to good yields with the use of a Lewis acid catalyst $Zn(OAc)_2 \cdot 2H_2O$ (10 mol%), which is inexpensive, accessible, and environmentally friendly. All the synthesized compounds were properly described using melting point, IR, NMR, and mass spectral studies, and the findings were compared with information from the earlier literature. The new method has a number of advantages over the traditional methods for the synthesis of divergent 2,3-dihydroquinazolin-4(1H)-ones, including a higher product conversion, a wide substrate range, and the absence of undesirable side products. Aliphatic, heteroaromatic and aromatic carbonyl compounds were well tolerated under the optimized reaction conditions.

Keywords: Quinazoline; 2,3-dihydroquinazolin-4(1H)-ones; catalysis; zinc acetate dihydrate ($Zn(OAc)_2 \cdot 2H_2O$) and cyclization. © 2023 ACG Publications. All rights reserved.

1. Introduction

Due to its astoundingly broad spectrum of pharmacological properties, the quinazoline scaffold (QZ) has taken a distinctive position in heterocycles containing nitrogen¹⁻⁷. One of the key quinazoline analogues, 2,3-Dihydroquinazolin-4(1H)-ones (DHQZ) (Figure 1), particularly the 2-aryl substituted derivatives, have been found to have a wide range of biological activities, including anticancer, antifungal, anti-fertility, diuretic, antifibrillatory, and choleric activities (Figure 2)⁸⁻¹⁰. Some isolated alkaloids from traditional Chinese medicine share the same scaffold. Quinazolin-4(3H)-ones are another class of compounds having different pharmacological actions from those of their dihydro counterparts, and they are easily converted from 2,3-dihydroquinazolin-4(1H)-ones¹¹⁻¹².

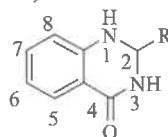


Figure 1. Structure of 2,3-dihydroquinazolin-4(1H)-ones (DHQZ)

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Detection of Cardiac Arrhythmia Using Multi-Perspective Convolutional Neural Network for ECG Heartbeat Classification



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ABSTRACT

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Keywords:

classification of heartbeat, convolutional neural networks (CNN), arrhythmia, electrocardiogram (ECG)

The leading death cause all over the world is heart disease. The presence of arrhythmias has to be examined to detect heart disease in early stage. The abnormality in heart beat rhythm is known as Arrhythmia. The speed of heart beat can be detected by Arrhythmia, it may be too slow, too fast or irregular patterns of heart beat are considered as Arrhythmia and there are various types of Arrhythmia. The electrocardiogram (ECG) produces signals, classification of such signals is very crucial for knowing the irregularity in the patterns of heart beat. As detection of arrhythmia is a challenging task, there is a great demand for an automatic detection technique to identify abnormal signals produced by heart which cannot be done manually. Therefore this paper provides a method for detection of Cardiac Arrhythmia using Multi-Perspective Convolutional Neural Network (MPCNN) for ECG Heartbeat Classification. Basing on Physionet's MIT-BIH Arrhythmia Dataset the signals of ECG arrhythmia can be categorized into five classes. Number of layers, filters and size of the filter are appropriate parameters which are heuristically optimized for operating swiftly for operation of MPCNN effectively. Compared with the ultra-modern methods as Quantum Neural Networks and Deep Convolutional Neural Networks, the proposed method results in efficient performance having high level accuracy of 96.46%, 98.1% and 96.2% are the F1 scores for SVP and PVC respectively. The effective detection of heartbeat rhythm and irregularities can be identified using this model.

1. INTRODUCTION

Maintenance of health is the most crucial part of human life as it states the quality of life of a person [1]. Out of all the organs in the body, the most important organs that plays key role for human life and body functionality is ones heart. The blood throughout the body is pumped through heart. The vital functionality of heart is to pump blood throughout the organs of the body, so that healthy maintenance of heart is very important. When there is abnormality in functioning of heart, the worst experience a person can have is death. According to 2016 census of the World Health Organization (WHO), the number of people dies because of heart disease 17.9 million i.e., more or equal to 31% of the world population died due to heart diseases. It is also identified that under 70 years of age around 17 million people were dead. As per the WHO sources The rhythm of heart beat can be deviated from its electrical activity [2] which is considered as Cardiac Arrhythmia. There are various kinds of Arrhythmia which are harmless. But, when Arrhythmia is caused due to the weakness of damaged heart, it may lead to serious consequences and fatal symptoms [3]. Usually Arrhythmias is classified into two kinds the first one is Brady cardiac which means slow heart beat and the other is tachycardia which means fast heartbeat. When a

person has complaints relating to heart functioning, as a part of initial assessment electrocardiogram (ECG) is performed. The ECG device represents the entire process of polarization and re polarization in the form of X-ray sheets.

The structure and functioning of heart can be studied with the help of Electrocardiography (ECG) which is an efficient technique used due to ease of access, non-invasiveness and less expensive [4]. During each heart beat it presents the depolarization and re polarization of muscles of heart is shown in the form of electrophysiological pattern. Due to various factors like baseline wander, external noise, physical variations among individuals [5] the heart beat classification automatically using ECG has become a challenging task. In case of a healthy person also there may be difference in rhythm and morphology of heartbeats during various circumstances [6]. Few elements that are vigorous against such situations are used in classification of heartbeat like characteristic points relating to morphological features, abstract features and transformation features generated by seizure interpretation.

In the field of biomedical signal processing and digital image processing [7] shows high demand for the deep learning algorithms which involves structures such as neural networks. A Machine Learning (ML) based technique called Deep Learning (DL) has the capacity of automatic feature extraction.

UNIT GRAPH OF TYPE - 2

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ABSTRACT The unit graph of ring R was introduced in commutative rings by Vasantha Kandasamy[27]. In this short note, we introduce the concept namely "Unit graph of type-2" denoted by $UG_2(R)$ in associative rings R and announced a few important fundamental results. In section 3, we prove that the number of edges in the unit graph of type-2 of Z_p is $\frac{p-3}{2}$. In section 4, we prove that sum of the degrees of the vertices in $UG_2(R)$ is equal to $(|U^*(R)| - \text{number of self units})$. Also we have included some examples.

Keywords Graph, Unit graph of a ring, Star graph.

AMS Subject Classification: 05C07, 05C20, 05C76, 05C99, 13E15.

1. INTRODUCTION

Let $G = (V, E)$ be a graph consist of a finite non-empty set V of vertices and finite set E of edges such that each edge e_k is identified as an unordered pair of vertices $\{v_i, v_j\}$, where v_i, v_j are called end points of e_k . The edge e_k is also denoted by either $v_i v_j$ or $\overline{v_i v_j}$. We also write $G(V, E)$ for the graph. Vertex set and edge set of G are also denoted by $V(G)$ and $E(G)$ respectively. An edge associated with a vertex pair $\{v_i, v_i\}$ is called a self-loop. The number of edges associated with the vertex is the degree of the vertex, and $d(v)$ denotes the degree of the vertex v . If there is more than one edge associated with a given pair of vertices, then these edges are called parallel edges or multiple edges. A graph that does not have self-loops or parallel edges is called a simple graph. We consider simple graphs only.

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Electrical and spectroscopic characteristics of B₂O₃-Bi₂O₃-Al₂O₃-MgO glasses alloyed with MnO

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ABSTRACT

In this study, the dielectric properties, electron spin resonance (ESR), optical absorption spectra, emission spectra, Raman spectra, X-ray diffraction (XRD), and Fourier transform infrared spectra were determined for the glass network 65B₂O₃-20Bi₂O₃-10Al₂O₃-(5-x)MgO-xMnO (0 ≤ x ≤ 1 mol%). The glass system was prepared by using the melt quenching and heat treatment process. Dielectric parameters were evaluated for the glasses in the broad frequency range (10³-10⁶ Hz), and the parameters indicated increases in the semiconducting nature of the glasses. ESR and emission spectra obtained for the samples demonstrated the presence of manganese ions in the divalent state. The optical absorption spectra contained bands due to Mn²⁺ ions. The optical band gap (E_g) and Urbach energy (ΔE) values were calculated for the samples. The E_g value decreased as the MnO concentration increased whereas the ΔE value tended to decrease, thereby suggesting a gradual decrease in the strength of the glasses. The amorphous properties of the glasses were demonstrated by the XRD spectra. The spectroscopic and dielectric analyses indicated the depolymerization of the glasses.

1. Introduction

Borate glasses alloyed with transition metal ions are considered potentially useful materials because of their unique spectroscopic and dielectric characteristics [1-6]. These glasses can be used as the basic components in various scientific, industrial, and laboratory applications, such as ionic conductors, laser host materials, solid electrolytes, luminescent materials, radiation dosimetry tools, cathode elements, solar energy transducers, sealing elements, and phosphors [1-6]. Borate systems combined with heavy metal oxides such as Bi₂O₃ are in great demand because they can be used as radiation shielding devices, photonic devices, ultra-fast optical tools, glass ceramics, reflecting windows, thermal, and mechanical sensors [1-5]. In the borate network, Bi₂O₃ exists in the forms of BiO₃ and BiO₆ structural units. The BiO₃ structural unit acts as a glass former and BiO₆ plays the role of a glass modifier. Bismuth ions can be present in glasses in different valence states (Bi⁺, Bi³⁺, Bi⁴⁺, and Bi⁵⁺) [1-5]. The valence state of the bismuth ion depends on the host material, preparation technique, temperature, and local environment. Glasses containing Bi³⁺ ions are used in the manufacture of optical devices [1,2]. Some borate glasses produce emission spectra in the near-infrared region (NIR) [6-10].

Borate glasses mixed with Al₂O₃ have excellent properties such as a high Young's modulus, low thermal expansion coefficient, low hardness, low density, and high electrical resistivity [4,5,7,11]. The Al₂O₃ material is present in the glass in the forms of AlO₄ and AlO₆ structural units. The AlO₄ structural unit acts as a glass former to strengthen the glass structure, whereas the distorted octahedral AlO₆ groups act as modifiers to establish bonding defects and reduce the strength of the glass [11-13]. MgO modifies the spectroscopic and dielectric properties of borate glasses. These oxides act like modifiers when they are integrated with borate glasses [14-18]. These products are suitable components for scientific and technical applications. The modifier oxide MgO breaks into the glass by rupturing it [14-18] and the oxygen in MgO breaks the local periodicity of the glass. The Mg²⁺ ions lead to deformations by cracking B-O-B bonds, thereby providing open paths for the movement of charges to enhance the electrical characteristics [14-18].

The electrical properties of glasses can be improved by adding multivalent transition metal ions [19-25]. When glasses are doped with metal oxides such as MnO, the manganese ions are generally present in the Mn²⁺ and Mn³⁺ states. Mn²⁺ and Mn³⁺ are paramagnetic ions. The electrical conductivity of the glass is expected to be enhanced due to electron hopping from Mn²⁺ to Mn³⁺ ions. These glasses can be used as

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Zn(OAc)₂·2H₂O-catalyzed one-pot synthesis of divergently substituted Imidazoles

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ABSTRACT

Wide range of 2,4,5-trisubstituted imidazoles were synthesized using eco-friendly, readily available, inexpensive Zn(OAc)₂·2H₂O (5 mol%) under solvent-free conditions in moderate to excellent yields by condensation of aldehyde, arylmonohalogenoacetic acid and benzene-1,2-dithiolane. The optimized reaction parameters were successfully applied for the synthesis of divergent 1,2,4,5-tetrasubstituted imidazoles using aromatic amine as fourth component. All the imidazole derivatives were sufficiently characterized by IR, NMR and Mass spectral analyses.

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1. Introduction

By carrying out several reactions in a single reaction step, multi-component reactions (MCRs) have a high potential for constructing a variety of small bioactive scaffolds with outstanding structural/economic economy. Additionally, they are useful tools for creating heterocyclic motifs that are biologically and pharmaceutically active.¹⁻⁴ Heterocyclic compounds are very important organic molecules and constitute the largest diversity of chemical compounds with a high industrial significance.⁵⁻⁷ For minimizing the production costs and operational simplicity, applications of solvent-free based synthetic strategies to meet the greener synthesis of pharmacologically relevant molecules have picked up some momentum.⁸⁻¹⁰

Since the dawn of time, substances containing imidazoles have been extensively studied. It therefore represents a major portion of the new medication development. Antifungal, antiepileptic, ACE inhibitors, and other drugs with an imidazole moiety have all been produced, studied, and marketed for the treatment of various ailments.¹¹⁻¹³ Additionally, imidazoles play a significant role in the synthesis of natural substances such as biotin, vitamin B12, histamine, and histidine. Kamal et al. recently reviewed the marketed drug possessing imidazole moiety, as shown in the Fig. 1.¹⁴ An organic molecule with imidazole derivatives has acquired a sustainable place in medical and clinical fields. The condensation of the imidazole unit is a significant synthetic technique in drug development. Due to their low vapour pressure and temperature stability, imidazole derivatives are employed as task-specific ionic liquids (TSIL), which are then used as catalysts and green solvents.¹⁵ In photography, photosensitive imidazole compounds are employed.¹⁶

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RESEARCH ARTICLE

Modeling of COVID-19 death rate using various air pollutants: A multiple linear regression approach

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Abstract

Air pollution is a significant health risk, especially for vulnerable populations such as children, people with chronic illnesses, the elderly, and the economically and socially disadvantaged. Furthermore, air pollution has enormous social costs that we all bear in the form of premature deaths, low productivity, sick leave, and other strains on the healthcare system. The primary sources of air pollution are traffic, home fires, and industry. Measuring NO₂ levels in air pollution reveals the extent of pollution caused by traffic, particularly diesel vehicles, which are the primary source of NO₂. COVID-19 rates are rising in areas with high levels of air pollution, according to mounting evidence. Toxic contaminants can make people more susceptible to COVID-19. The causal relationship between air pollution and COVID-19 cases has yet to be established, but experts warn that long-term exposure will undoubtedly make people more susceptible to lung infections. Air pollution has been linked to an increase in cancer, heart disease, stroke, diabetes, asthma, and other comorbidities by inducing cellular damage and inflammation throughout the body. All of these factors increase the risk of death in COVID-19 patients. As a result, air quality parameters must be predicted and monitored. To predict results, this study proposes a statistical-based machine learning approach. Using multiple linear regression (MLR), Decision Tree (D.T.), and Random Forest (R.F.), the experimental results achieved 80%, 73%, and 65% accuracy on the dataset, respectively.

KEYWORDS

air pollution, COVID-19, decision trees, human health, multiple linear regression, random forest

1 | INTRODUCTION

Air pollution has been linked to heart attacks, strokes, diabetes, and high blood pressure, as well as previous medical issues that increase the risk of COVID-19 spread and death (Kumar & Pande, 2022). With the inhalation of pollutant particles such as PM_{2.5}, particles, move from the lungs to the veins, causing inflammation and accelerating stress (Liu et al., 2022). Cell damage typically heals when the body's free radicals and oxidants are out of balance. Damage to the endothelium, the inner lining of the arteries, causes constriction and hardening. COVID-19 is now classified as an endothelial disease because it enters

the body through the lungs and causes blood vessel damage similar to human immunodeficiency viruses (HIV). Pollutant emissions have decreased marginally since early 2020 due to the coronavirus epidemic and lockouts implemented in several countries (up to 40%) (Bekkar et al., 2021). Particulate matter (PM_{2.5} and PM₁₀) and NO_x (nitrogen oxide released in traffic emissions) are three of the most dangerous pollutants, and prolonged exposure can cause severe respiratory illnesses.

Regarding COVID-19, air pollution has been shown to increase the number of cases and fatalities in the United States due to the rollback of environmental legislation. In 2017, air pollution was responsible for 5 million deaths due to chronic pulmonary illness, heart attacks,

RESEARCH ARTICLE

Forecasting the impact of meteorological parameters on air pollutants in Andhra Pradesh using machine learning techniques

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Abstract

In the 21st century, air pollution has emerged as a significant problem all over the globe due to a variety of activities carried out by humans, such as the acceleration of industrialization and urbanization. SO_2 , NO_2 , and NH_3 are the key components contributing to air pollution. Moreover, these air pollutants have a significant connection to several climatic characteristics, such as the speed of the wind, the relative humidity, the temperature, the amount of precipitation, and the surface pressure. As a result, machine learning (ML) is regarded as a more effective strategy for predicting air quality than more conventional approaches such as probability and statistics, among others. In the research, Decision Tree (DT), Support Vector Regression (SVR), Random Forest (RF), and Multi-Linear Regression (MLR) algorithms are used to make predictions about air quality, and MSE (Mean Squared Error), RMSE (Root Mean Square Error), MAE (Mean Squared error), and R^2 are used to determine how accurate the predictions are.

KEYWORDS

air pollution, machine learning, particulate matter, prediction

1 | INTRODUCTION

In recent years, there has been a decrease in the air quality in the cities of India. Emissions of pollutants such as nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and ammonia (NH_3) have been released into the atmosphere, where they have the potential to have a detrimental effect on the health of humans (Sharma et al., 2021). The levels of air pollution are controlled by a number of meteorological factors, including the speed of the wind, the humidity, the amount of precipitation, the surface pressure, and the temperature. Since our sweat is unable to dissipate into the air when the humidity is high, we experience a significant increase in the sensation of heat (Vineeta et al., 2019). Urbanization is one of the key causes of air pollution because it results in increased emissions of pollutants into the atmosphere from growing transportation infrastructure. The industrialization of land also contributes significantly to the problem of air pollution (Mokhtari et al., 2021). The compounds nitrogen oxide (NO), carbon monoxide

(CO), particulate matter (PM), respirable suspended particulate matter (RSPM), and sulfur dioxide (SO_2) are considered to be among the most harmful pollutants. As thermal fuel is burned, nitrogen oxide is created; nitrogen oxides are known to cause feelings of lightheadedness and nausea. Because of this, it is very important to forecast the quality of the air in order to battle air pollution (Manisalidis et al., 2020).

For this, we can employ machine learning (ML) models. A computer may learn how to create models with the use of training data via a process known as ML (Bekkar et al., 2021). It is a branch of artificial intelligence that allows computer systems to forecast events with increasing degrees of accuracy. The term "predictive analytics" was used to describe this topic. ML can look at many types of data and find trends and patterns. A computer program can do a task using ML, which is the capacity to do so without external programming. This work is completed using several statistics and sophisticated mathematical techniques (Abed Al Ahad et al., 2020).



A CASE STUDY ON PUBLIC TRANSPORT SERVICE IN URBAN AREAS

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ABSTRACT

Present study on detailed examination of a quality of service indicator utilised by the APSRTC to assess the opinions of passengers towards bus transport. The quality of service indicator takes the form of a 20 item opinion scale which covers an array of service aspects. Regression analysis is used to identify hidden constructs which are present within this scale. It is identified some of the factors covering convenience, environment and ease of use issues towards perceived quality of bus service. The study will be useful in explaining variations of bus transport satisfaction. Results of the analysis may suggest regarding quality of bus service vary significantly across passenger groups, with females having a tendency to exhibit relatively negative opinions regarding the quality of the APSRTC environment with a similar finding will be observed in the case of passengers who are looking after the home and family. In addition, peoples suggestions towards improvements to service frequency, availability, reliability and stability will likely increase perceived satisfaction amongst existing passengers. At a more general level, the study demonstrates the level of additional knowledge which can be attained through more detailed analysis of existing transport policy data.

Keywords: comfort, passengers, perception, regression, quality.

1. INTRODUCTION

Andhra Pradesh State Road Transport Corporation (or APSRTC) is the state-owned road transport corporation in the Indian state of Andhra Pradesh. Its headquarters are located at NTR Administrative Block of RTC House in Pandit Nehru bus station of Vijayawada. Many other Indian metro towns in Telangana, Tamil Nadu, Karnataka, Odisha, Yanam and Chattisgarh are also linked with the service.

APSRTC was formed on 11 January 1958 as per Road Transport Corporations Act 1950. Earlier, it was a part of Nizam State Rail and Road Transport Department. Consequent upon bifurcation of Andhra Pradesh state into Telangana and residual Andhra Pradesh, TSRTC operated as a separate entity from 03.06.2015. APSRTC working Vijayawada (Pandit Nehru Bus Stand) as Headquarters 13 district New State of ANDHRA PRADESH.

The organisation is divided into twelve Regional Managers with four zones. It has a total of 11,678 buses (government-owned 8964; hire on rental 2714) operating in 44.15 lakh kilometres and has a total of 426 bus stations and 126 bus depots.

Guiding Principles of APSRTC

- To provide efficient, effective, ethical management of the business.
- To assist the State administration in attaining good governance. To treat the customer, i.e. passenger, as a central aim of the Corporation's business and provide the best likely facility.
- To explore and exploit technological, financial and managerial opportunities and developments and render the business cost effective at all times.

1.1 Vijayawada

Vijayawada is a city in the Andhra Pradesh Capital Region, on the banks of River Krishna in Krishna

district. The city is the third most compactly populated in the urban population of urbanized areas in the world and is the second major city in Andhra Pradesh by population.

As of 2011 Census of India, the city had a population of 1,476,931. The total population constituted 524,918 males and 523,322 females for a sex ratio of 997 females per 1000 males higher than the national average of 940 per 1000. 92,848 children were in the age group of 0-6 years, in that 47,582 were boys and 45,266 were girls: the ratio is 951 per 1000. The average literacy rate stood at 82.59% (male 86.25%; female 78.94%) with 789,038 literates, significantly higher than the national average of 73.00%. Vijayawada is one of the most compactly populated cities with about 31,200 people per square km.

The main modes of intra-city public transport are city buses and auto rickshaws. Apart from these, other means of transport are motorcycles, cycle rickshaws, and bicycles. The PNBS and the Vijayawada railway station are the major transport organization in the city for road and rail transport. Also two more are other modes of transport organizations i.e., Autonagar bus terminal and city bus port. Another nearest railway station to Vijayawada is Krishna canal Junction. The Pandit Nehru bus station is the administrative headquarters of APSRTC, which is ranked as the fourth largest and busiest bus terminals in the country. The Vijayawada City Division of APSRTC operates close to 450 buses for an average of 300,000 daily commuting passengers and is supported by BRTS corridors. The two main National Highways of NH16 (Old NH5) and NH-65 (previously designated as NH-9) provides access to other states. National Highway 30 from Jagdalpur of Chhattisgarh terminates near the city suburb of Ibrahimpatnam. The Inner Ring Road connects NH 16 and 65 to serve the main purpose of easing traffic congestion. The city has a entire road length of 1,264.24 km (785.56 mi), casing1, 230.00 km (764.29 mi) of municipal roads, 22.74 km (14.13 mi) of R&B department

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A Novel Deep Convolutional Neural Network for Diagnosis of Skin Disease

By

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Abstract Due to its intricacy, dermatology presents the most challenging and uncertain terrain for diagnosis. Skin conditions like Carcinoma and Melanoma are frequently very challenging to identify in the early stages and are much more challenging to define independently. The use of pattern recognition models to automate detection has been studied by a number of writers. This research describes a novel Deep Convolutional Neural Network (DCNN) for Skin Disease Detection. The photographs of skin would undergo processing to remove unwanted noise as well as to improve the photos. The performance of classification will be greatly impacted by the pixel values of a picture. The picture is classified using the softmax classifier method by feature extraction utilising DCCN, and a diagnosis report is produced as the result. In comparison to more classic approaches like KNN (K-Nearest Neighbour) and CNN, this methodology will provide results faster and with improved accuracy, precision, and recall. With a detection time of 10,000 milliseconds, DCNN achieved accuracy, precision, and recall percentages of 98.4%, 96.3%, and 97.2%, respectively.

Keywords **Author Keywords:** image processing; deep convolutional

neural network; skin images; skin diseases; melanoma and carcinoma

Keywords Plus: IMAGES

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A Novel Deep Convolutional Neural Network for Diagnosis of Skin Disease

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ABSTRACT

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Due to its intricacy, dermatology presents the most challenging and uncertain terrain for diagnosis. Skin conditions like Carcinoma and Melanoma are frequently very challenging to identify in the early stages and are much more challenging to define independently. The use of pattern recognition models to automate detection has been studied by a number of writers. This research describes a novel Deep Convolutional Neural Network (DCNN) for Skin Disease Detection. The photographs of skin would undergo processing to remove unwanted noise as well as to improve the photos. The performance of classification will be greatly impacted by the pixel values of a picture. The picture is classified using the softmax classifier method by feature extraction utilising DCCN, and a diagnosis report is produced as the result. In comparison to more classic approaches like KNN (K-Nearest Neighbour) and CNN, this methodology will provide results faster and with improved accuracy, precision, and recall. With a detection time of 10,000 milliseconds, DCNN achieved accuracy, precision, and recall percentages of 98.4%, 96.3%, and 97.2%, respectively.

1. INTRODUCTION

About 10 to 12% of the Indian population suffers from skin problems [1]. In the same way that the skin protects the body and takes in sensory input from the environment, the largest organ in the human body, the skin is made up of seven layers of ectodermic tissue and protects the muscles, internal organs, and skin.

Increased population, harmful UV (Ultra-Violet) rays, poor hygiene, and global warming are the factors that stimulate skin disease. Dermatological conditions are among the most common illnesses in the world [2].

Due to the scarcity of dermatological specialists, complexity, and variation, dermatological disorders are excellent hard terrains for quick, accurate diagnosis in both developed and developing nations [3].

Additionally, it is well known that in many circumstances, early identification lowers the likelihood of serious results. The most recent environmental conditions, however, simply serve as a trigger for some skin illnesses. When conditions like melanoma, psoriasis, eczema, and herpes are discovered in their early stages, a person's life is saved from imminent risk.

Skin infections are considered to be more fundamental in most diseases and risk factors for the majority of malignancies [4]. There are many different skin problems that can afflict people. These conditions can be recognised and diagnosed by their symptoms, and they can all be treated effectively by a

skin expert. In the past, a pathologist would perform a prognostic study on the affected skin area in order to classify the skin infection.

Biopsies are used to carry out the process, which may involve removing the afflicted skin area and sending it for testing at a lab to determine whether cancer is present. Histopathology can be performed on a sample of skin to grade the diseases and determine the most appropriate course of treatment for infections of the later classified as appropriate categories.

An inconsistent education in dermatology at the undergraduate level, which is typically prohibited, suggests that students need to re-evaluate their present knowledge and abilities in this particular area. Nearly 90% of skin conditions are now only treated by primary care. This would imply that many questions about skin problems might have answers if care were to be taken at an earlier time.

The quality of life for people with skin conditions may be considerably impacted. As prevalence of skin problems have increased, earlier stage detection is becoming more important for successful treatment. Early identification of skin conditions is crucial, and general practitioners (GP) play a key role in this [5]. There are several initiatives for integrating traditional medicine across the world, especially in less technologically developed nations where attempts are made to overcome challenges including the absence of affordable medical tools and equipment and medical competence.

RESEARCH

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Analysing the impact of contextual segments on the overall rating in multi-criteria recommender systems

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Abstract

Depending on the RMSE and sites sharing travel details, enormous reviews have been posted day by day. In order to recognize potential target customers in a quick and effective manner, hotels are necessary to establish a customer recommender system. The data adopted in this study was rendered by the Trip Advisor which permits the customers to rate the hotel on the basis of six criteria such as, Service, Sleep Quality, Value, Location, Cleanliness and Room. This study suggest the multi-criteria recommender system to analyse the impact of contextual segments on the overall rating based on trip type and hotel classes. In this research we have introduced item-item collaborative filtering approach. Here, the adjusted cosine similarity measure is applied to identify the missing value for context in the dataset. For the selection of significant contexts the backward elimination with multi regression algorithm is introduced. The multi-collinearity among predictors is examined on the basis of Variance Inflation Factor (V.I.F). In the experimental scenario, the results are rendered based on hotel class and trip type. The performance of the multiregression model is evaluated by the statistical measures such as R-square, MAE, MSE and RMSE. Along with this, the ANOVA study is conducted for different hotel classes and trip types under 2, 3, 4 and 5 star hotel classes.

Keywords: Recommender system, Collaborative filtering, Hotel classes, Trip types and backward elimination

Introduction

The tourism industry plays a major role for the growth of country's economy. In order to scatter the tourism information the internet plays a major role in most of the countries. Currently everyone wishes to energize themselves in the vacation by visiting the locations all around the globe in the categories of middle and upper sections of users [1]. Once in a year the users plan their vacations due to an increase in socioeconomic factors. To fulfil their aspirations online travel platform is one of the great opportunity. To resolve the information overload issue, the recommender system was introduced to help the users by analysing the user preference information [2]. Based on recommendation approach the recommender systems can be categorised in to content-based, collaborative filtering (knowledge-based), and hybrid [3, 4]. The content based recommendation