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Proceedings of National Conference on "Computational Intelligence for Data Science Application" on 20th September, 2021

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Dr. J. Mahender Reddy
Vice-Chancellor, ICFAI Foundation for Higher Education

Message from the Vice-Chancellor

Greetings!

It is with great pleasure that I welcome you to the ICFAI Foundation for Higher Education (IFHE) declared as a Deemed-to-be University established under section 3 of the UGC Act, 1956.

IFHE is a premier Educational Institution in Telangana State which is accredited by NAAC with 'A' grade. It is dedicated to the cause of teaching and research of global standards. It offers B.Sc, B.Tech, B.Arch, M.Tech, BBA, BBA-LLB (Hons), BA-LLB (Hons), LLM, MBA and Ph.D. programs. The students are from all parts of India. In fact, there is a mini India on the campus. The University has a student strength of about 6,100 and a faculty strength of about 300. We envision developing a new cadre of professionals who will not only command a high level of domain proficiency but also have the ability to integrate activities for developing scientific and technological solutions and work standards.

The quality of the programs offered at the University is ensured by the following five factors:

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Dr K.L Narayana
Director, IcfaiTech

Message from the Director

Greetings!

IcfaiTech (Faculty of Science & Technology) is a constituent of the ICFAI Foundation for Higher Education (IFHE). IcfaiTech aims at nurturing graduates and researchers who will become critical thinkers and innovators with holistic education experience. At the first degree and higher degree levels, students are given the flexibility to choose their academic courses from a wide range of electives offered to them. Innovative methods of teaching, cutting-edge curriculum, workshops and internships further broaden the intellectual and global outlook of the students.

The Internship Programs are a unique feature of education at IcfaiTech. Internships help graduates become more practical oriented and innovative. Dedicated Faculty and industry experts supervise the student performance and assess them during the Internship Program.

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I invite all the aspirants to seek admission into the IcfaiTech Programs and become technology-driven professionals.

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Dr A.Vadivel
Dean, IcfaiTech

Message from the Dean

Greetings!

It gives me immense pleasure to greet and welcome you all on behalf of the IcfaiTech family. Your decision to join IcfaiTech is just the beginning of a highly rewarding professional career.

IcfaiTech is inherited with a rich experience in engineering education for about two decades. Over the years, it has established itself as a favourite destination for students across the country. It has state-of-the-art infrastructure, fully developed laboratories, a library with a wide range of collections and a large pool of highly qualified and experienced faculty.

IcfaiTech graduates are strong communicators and effective leaders with the adaptability and entrepreneurial drive to keep pace with evolving technologies and the demands of the marketplace. IcfaiTech faculty members are recognized for exemplary teaching and trailblazing research. As a community, we are collaborative by nature, innovative in spirit and focused on making a difference. Together, we have built an environment for learning and discovery unlike any other.

I welcome you to the IcfaiTech and invite you to be a proud member of this ever-growing fraternity.

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Department of Computer Science & Data Science

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Magnetic Resonance Imaging for Segmentation of White Matter, Gray Matter and Fibre Tractography in Neurosurgery: A Systematic Analysis, Issues and Solutions

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(Deemed to be University under Section 3 of the UGC Act, 1956), Hyderabad

Abstract

Diffusion magnetic resonance imaging (dMRI) tractography is an advanced imaging technique that enables in vivo mapping of the brain's white matter connections at a macro scale. Segmentation of brain tissue from diffusion MRI (dMRI) is an important task, required for quantification of brain microstructure and for improving tractography. Current dMRI segmentation is mostly based on anatomical MRI (e.g., T1- and T2-weighted) segmentation that is registered to the dMRI space. However, such inter-modality registration is challenging due to more image distortions and lower image resolution in dMRI as compared with anatomical MRI. Over the last two decades, the study of brain connectivity using dMRI tractography has played a prominent role in the neuroimaging research landscape. In this paper, we provide a high-level overview of how tractography is used to enable quantitative analysis of the brain's structural connectivity in health and disease. We first provide a review of the methodology involved in three main processing steps that are common across most approaches for quantitative analysis of tractography, including methods for tractography correction, segmentation and quantification. For each step, we aim to describe methodological choices, their popularity, and potential pros and cons. We then review studies that have used quantitative tractography approaches to study the brain's white matter, grey matter, focusing on applications in neurodevelopment, ageing, neurological disorders, mental disorders, and neurosurgery. We conclude that, while there have been considerable advancements in methodological technologies and scope of applications, there nevertheless remains no consensus about the "best" methodology in quantitative analysis of tractography, and researchers should remain cautious when interpreting results in research and clinical applications

Keywords: dMRI**,** Fibre Tractography**,** Gray Matter**,** Segmentation**,** White Matter

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Workload Balancing in Fog-3 Computing

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Abstract:
The relations of cyclin-dependent kinase complex is sound branded for their role in the cell separation cycle. Inhibitors of cyclin-dependent kinases are anticipated to hold therapeutic utility beside a wide diversity of proliferative diseases, particularly cancer. For docking study, the protein 2C4G from Protein Data Bankwas chosen to complete docking study beside few amino pyrazole inhibitors. compound from this relations are shown to potently inhibit cyclin-dependent kinesis by competing with ATP for compulsory to a catalytic subunit of the protein. All default parameters are measured for docking analysis. The study resulted in molecule 17 with high dock score (−11.38 kcal/mol) that showed correlation with experimental activity (0.051 mM). just about all molecules showed consistency with experimental data.

Keywords: IoT, Base Stations, BSS

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A Deep Learning-based approach for an Automated Brain Tumor Segmentation in MR images

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Abstract

Brain tumor classification is done by biopsy, which is not normally performed due to conclusive brain surgery without invasive interventions, improving technologies and machine learning can help radiologists detect tumors. MRIs are commonly used imaging techniques for the study of these tumors, but the vast volume of knowledge given by MRI prevents manual break-up over an acceptable time span, reducing the use of accurate quantitative calculations in clinical practice. This paper introduces an approach to program division based on Convolution Neural Networks (CNN). The proposed work uses a 300 MR image dataset from Kaggle with 70% Training and 30% Testing. In addition to having a positive impact on overfitting, Kernel 3x3 enables the construction of a deeper architecture, providing a lower number of weights in the network. The application of force standardization was also discussed here as a pre-preparation step, which has proven extremely viable in MRI images for brain tumor division, despite its lack of regularity in CNN division strategy and data extension. Detection of accurate tumor cells where high region density is contaminated. The extraction and identification of tumor from brain MRI scans are conducted using the MATLAB tool. The accuracy was 92.50 % with good generalization capabilities and good speed of execution, and for medical diagnostic radiologists, the new developed CNN architecture will be an essential decision-making tool.

Keywords: Brain tumor segmentation, Convolutional neural network, Deep learning, MR imaging.

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Security Issues RelatedtoWorkload Balancingon Fog Nodes

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Abstract:
As Latency is the key performance metric for IoT applications, fog nodes co-located with cellular base stations can help to reduce the latency rate. Therefore, data is offloaded to fog nodes as it is difficult to fetch data from Cloud. So here we group some of the IoT devices in a local area and locate nearby the base station to reduce the traffic load on data. Some base station may be fully loaded or some not so it may occur congestion so here we situate fog nodes to reduce huge load balance on base station. However, the latency in IoT devices contains both the communications latency and computing latency. Thus, traffic load between IoT devices and base station is huge, so it affects latency rate between both IoT side and base station side. To solve this problem, we propose a workload balancing scheme in a fog network to minimize the traffic load between IoT devices and bases station and improve latency rate.

Keywords: IoT, Base Stations, BS

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Air Quality Prediction Hyderabad Using Linear Regression

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Abstract

Air Quality is usually referred to as the extent to which air in a particular region is polluted and not polluted. It is used as an indicator to inform people living in that area to take necessary precautions. Air is one of the few natural resources which is consumed in very large amounts by every living organism, so the extent of its contamination will have adverse effects. In humans, breathing disorders and lung diseases are caused due to air pollution. In urban and semi-urban areas this is a major issue after the industrial revolution. Hyderabad is a city with lots of industrial areas and it is also a home for more than 1 core people, so regular estimation of air quality is necessary. Air quality in Hyderabad drastically varies from location to location, but the overall quality of air remains within the normal range. So, in this paper air quality data for the year 2018 from 5 different industrial areas of Hyderabad are taken into consideration. Linear regression is used in this research paper for predicting Air Quality.

KEYWORDS: Linear regression, Air Quality Index, Air Quality, Air Pollution

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Repeated Histogram Threshold with Fuzzy measures with means of C-means

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Abstract:
In this paper, an automatic histogram brink approach based on a fuzziness quantify is presented. This work is an enhancement of an presented method. Using fuzzy logic concept, the problems involved in verdict the minimum of a criterion function are avoided. Similarity between gray levels is the key to find an optimal threshold. Two initial regions of gray levels, located at the boundaries of the histogram, are defined. Then, using an index of fuzziness, a similarity process is started to find the threshold point. A significant contrast between objects and background is assumed. Previous histogram equalization is used in small contrast images. Fuzzy c-means (FCM) is a method of clustering which allows one piece of data to belong to two or more clusters. This method is frequently used in pattern recognition. It is based on minimization of the objective function! No prior knowledge of the image is required.

Keywords: FCM, Threshold, Histogram

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SQL Vs Blockchain

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Abstract

Bitcoin, the first and most popular cryptocurrency. Blockchain technology, the technology behind the success of Bitcoin is a distributed, decentralized and secure system that stores every bitcoin transaction over the network. Both commercial and academic domains have embraced the technology for its distinct features. It is identified as the Internet of Value(IoV) where the valuable assets can be transmitted as information in a secured way. Blockchain stores everyday transactions and has more operational data which is an OLTP system. Applying data analytical queries over a blockchain is not effective. To overcome this issue, in this paper, an approach for storing the blockchain data over SQL databases for easy and quick access is presented. A detailed analysis of the blockchain database and how SQL can be adopted in improving the performance of the querying process is also discussed.

Keywords: Blockchain, Internet of Values(IoV), OLTP, SQL queries

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A Configuration-based drug plan studies on CDK2 amino pyrazole inhibitors with Autodock Tools

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Abstract:
The relations of cyclin-dependent kinase complex are sound branded for their role in the cell separation cycle. Inhibitors of cycling-dependent kinesis are anticipated to hold therapeutic utility beside a wide diversity of proliferative diseases, particularly cancer. For docking study, the protein 2C4G from Protein Data Bankwas chosen to complete docking study beside few amino pyrazole inhibitors. compound from this relations are shown to potently inhibit cyclin-dependent kinesis by competing with ATP for compulsory to a catalytic subunit of the protein. All default parameters are measured for docking analysis. The study resulted in molecule 17 with high dock score (−11.38 kcal/mol) that showed correlation with experimental activity (0.051 mM). just about all molecules showed consistency with experimental data.

Keywords: autodock, 2C4G, ATP

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Web 3.0: A Systematic Study of the Decentralized Internet from a Crypto Perspective

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Abstract

Technologies come and go regularly but few cause a widespread effect, be it positive or negative. Web 3.0 is one such innovation that aims to decentralise every aspect of the Internet, eliminating the need for corporations that run the world. The evolution of the Web from being "read-only" to "executable" has brought a lot of changes in the way humans interact/communicate with machines. Every computer on the network is considered a node and as per the requirements, even a single computer can be called a server. Web 3.0 will change the way we work and collaborate, ensuring global connectedness. With Web 3.0 being open, trustless and permissionless, limitless things can be achieved because of lesser restrictions unlike Web 2.0. The metaverse bridges the gap between the physical and virtual worlds, making it more fun and interactive for the users. Other applications like DeFi, DAO, smart contracts are widely being used and are gaining popularity each passing day. Apart from being popular, they are giving effective results, making them a few of the largest components of the blockchain technology that we know today. The extreme amounts of computational power being expended on a blockchain are deemed to be unsustainable but measures are being taken to reduce the effect caused by blockchain on the climate.

Keywords: Web 3.0, trust-less, permission-less, blockchain, computation.

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A systematicadvance for Segmentation and Clustering Procedure of enhanced K Means and Neural Networks

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Abstract:

The image segmentation is an attempt to categorize comparable colors of image in the same group. It cluster colors into numerous groups based on the closeness of color intensities within an image. In preprocessing to use improvement there are two segmentation technique to be appropriate for Image clustering & Artificial Neural Network .Algorithms based on cluster methods are normally used to obtain data, which are based on the features space, where these groups are represented by clusters. In existing local threshold and fuzzy set measure is used in that we can only classify the images. Now we apply Neural Network segmentation relies on processing small areas of an image using an artificial neural network or a set of neural networks. After such processing the decision-making mechanism marks the areas of an image accordingly to the category recognized by the neural network.

Keywords: Image Segmentation, Enhancement, Improved K-means, ANN

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Implementing A Deep Learning Model For Traffic Flow Prediction

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Abstract

In our contemporary society, more and more complex tasks are being solved using Convolutional Neural Networks (CNN). Because CNN's are known for their high recognition rate and rapid execution. In this paper, we propose an implementation of a traffic flow prediction model using a deep learning-based Convolution Neural Network. Several well-known architectures available to predict traffic flow accurately are also analysed and presented in this paper. Here, the neural network is trained using the "Keras" library and heavily parallel architecture for CUDA. The entire procedure for traffic flow prediction is executed in real-time on a mobile GPU. The experimental results proved the high efficiency of the developed model.

Keywords: Deep Learning, CNN, traffic flow prediction, Keras, mobile GPU, CUDA.

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Requirements Identification on Automated Medical Care with Appropriate Machine Learning Techniques

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Abstract:

Generally, medical diseases can be identified based on their symptoms already derived. Most of the medical diseases are not new and the symptoms are already plotted with results. The diseases like COVID19 are new and it is still in the observation stage. Whenever the symptoms are conceivable such as, the demand for automation in prediction exists. Such demand leads to the development of automated medical care machine which can deliver the suggestions or prescriptions in absence of doctors due time or place constraints (now it is higher due to COVID19 pandemic). In a few situations, doctors can also help patients with live video streaming assist mechanism. The automated machine can also produce the required medicine as per the basic needs. Many research papers are coming up on this aspect now a day. It is important to focus on this medical need on the way of researches done and the room to improve further shortly. When dealing with such automated prediction, the previous predictions and results happened should be taken into considerations. In such case, the big data with machine learning algorithms play a vital role in this process. In this article, the best-fit machine learning algorithm was identified for medicalrelated data sets.

Keywords: Automated Medical Care Machine, Video Streaming Assist Mechanism, Medical Diseases, Prescriptions and Medicine, COVID19 pandemic.

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Fusion of MRI and CT Brain Images by Independent Component Analysis

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IcfaiTech (Faculty of Science and Technology),Icfai Foundation for Higher Education (IFHE),
(Deemed to be University under Section 3 of the UGC Act, 1956), Hyderabad

Abstract

Image fusion is the task of enhancing the image by combining two images into a single image, the resultant image contains important features. The resultant image contains more information when compared to the two images. Independent Component Analysis (ICA) is a computational method for separating a multivariate signal into additive subcomponents supposing the mutual statistical independence of the non-Gaussian source signals. Through this method, we can achieve a better view of functional and structural parts in MRI and CT images. Different fusion methods of ICA are described that includes maximum absolute, regional-based, weighted base, mean based, adaptive fusion. The fusion algorithm is used to calculate the Peak Signal Noise Ratio (PSNR) and Root Mean Square of the fused image.

Key Words: Independent Component Analysis, Peak Signal Noise Ratio, Root Mean Square

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Semantic Image Segmentation using Deep Learning for Low Illumination Environment

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Abstract:

Images taken in low-light environments are vulnerable to low visibility, which can also reduce the efficiency of several applications for computer vision and computational photography. Images can be easily captured by different image acquisition devices these days. Low-illumination images will be produced by weak lighting conditions and technologies with poor filling flash. It is difficult to classify these damaged images, and certain approaches should be handled via the computer. A new semantic image segmentation based on the deep learning techniques was proposed for improving the visibility of images captured in the low illumination environment. An improved deep learning approach to segment low-illumination images is proposed in this paper, based on existing CNN research on the low illumination environment. Also, to train and test our methodology, a low illumination image dataset is created. On low illumination images with mixed noises, the robustness and efficiency of the proposed system are evaluated. Results show that other techniques of image segmentation are outperformed by the proposed technique.

Keywords: Image Segmentation; Deep Learning; Low illumination

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Forecasting Flight Delays with Error Reckon using Machine Learning Classifiers

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(Deemed to be University under Section 3 of the UGC Act, 1956), Hyderabad

Abstract

Flight delay is a major problem in the aviation sector. During the last two decades, the growth of the aviation sector has caused air traffic congestion, which has caused flight delays. Flight delays result not only in the loss of fortune also negatively impact the environment. Flight delays also cause significant losses for airlines operating commercial flights. Therefore, they do everything possible in the prevention or avoidance of delays and cancellations of flights by taking some measures. In this paper, using machine learning models such as Logistic Regression, Decision Tree Regression, Bayesian Ridge, Random Forest Regression and Gradient Boosting Regression we predict whether the arrival of a particular flight will be delayed or not.

Key word: Logistic Regression, Decision Tree Regression, Bayesian Ridge, Random Forest Regression, Gradient Boosting Regression.

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PREDICTION OF CHRONIC DISEASES AT AN EARLY PHASE USING MACHINE LEARNING APPROACH

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Abstract:

Modern times have been affected by diverse diseases due to the environment and living habits. As a result, predicting disease earlier becomes a critical task. The doctor, on the other hand, finds symptom-based prediction to be too difficult. The task of disease prediction is the most difficult. In order to predict the disease, data mining and smart devices play a key role. In medical science, annual data growth is significant. Because of increased data growth in the medical and healthcare fields, accurate medical data analysis has been beneficial from early patient care. Data mining reveals massive amounts of medical data by use of disease data in hidden pattern data. According to a precise 569 rows and 32 columns classification for cancer, heart disease, kidney disease and other diseases, in one out of 28 individuals, in India, were reported. Similarly, we are evaluating accessible data from a combination of genetic algorithm and support vector machine data collection in Wisconsin in order to build reliable prediction models for these chronic diseases using machine-learning techniques. — In this experiment, we compare four disease classification results using SVM, MLP, J 48, and KNN, and the results show that SVM has the highest accuracy, at 84.61 percent.

Keywords: Chronic Disease, Smart device, Data mining, Genetic algorithm, Machine Learning

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Cooperative Navigation for Multi-Robots in Unknown Environments Using Hybrid Jaya-DE Algorithm

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Abstract

Since its inception robotics has emerged as a major scientific discipline, extensive research has led to several developments in the past decades to improve its efficiency. The robot navigates from its predefined starting positions to the designed goal positions to perform the desired tasks as assigned by the end-user. Safe navigation in addition to attaining the shortest path is of prime concern in the problem of interest. Significant effort has been made in the early research work to make robots intelligent via several algorithms to address the concern. The proposed algorithms do not substantiate solutions of interest in the case of multi-robot path planning. Furthermore, the inevitability of achieving path smoothness as well as minimizing energy requirements has made the present problem more complex. Therefore, there is a need of searching for some computationally stable algorithms that can provide the desired solutions with a less computational burden. The emerging of meta-heuristic approaches has made it possible of solving numerous complex engineering optimization problems because of some positive attributes such as 1. Simple; 2. Easy to implement; 3. Robust; and 4. Computationally stable. The need of the present scenario is to figure out some meta-heuristic approaches whose architecture resembles the multi-robot path planning problem. To achieve this, an efficient navigation controller embedding a hybrid Jaya-DE algorithm has been proposed to obtain an optimum path of the individual robot. The efficiency of the proposed navigation controller is evaluated through simulation. The outcomes of the simulation reveal the efficacy of the suggested controller in monitoring the robots towards achieving a safe and optimal path. The strength of the suggested controller is further verified with a similar problem framework. The potency of the proposed controller can be seen from the outcome in resolving the navigation of mobile robots as compared to its competitor.

Keywords: Multi-robot Navigation, waypoints, Jaya algorithm, Differential Evolution, V-Rep, Pioneer-P3dx

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A Systematic Literature Review on Malware Analysis

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Abstract:
Malware is a significant security danger on the Internet nowadays. Hostile to Virus organizations get a huge number of malwares tests each day. It is intended to harm PC frameworks without the information on the proprietor utilizing the framework and method headways are presenting enormous difficulties for scientists in both the scholarly world and the business. Malware tests are arranged and gathered for additional investigation. In this literature review, we did the manual research on the publications from the year 2014 to 2020. We selected about 27 articles out of 55 articles as primary studies and applied quality evaluation criteria and deducted research questions from them. The motivation behind this SLR is to inspect the accessible literary works on malware examination and to decide how exploration has developed and progressed regarding the amount, substance, and publication outlets. We also discussed the issues and challenges we are facing in malware analysis along with detection system requirements. Large numbers of the malicious programs are tremendous and confounded so it is difficult for researchers to fathom its subtleties. Scattering of malicious data beyond clients of the web and furthermore preparing them to effectively utilize against malicious items are critical to shielding clients from malicious attack. This review paper will give a comprehensive book index of techniques to help with battling malicious data.

Keywords: Malware,Malware analytics,Malware code,Taxonomy,Signature-based,Anomaly-based,Malware system requirements

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Automated TSR Using DNN Approach for Intelligent Vehicles

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Abstract:

Traffic Sign Recognition (TSR) system has become an indispensable component for intelligent vehicles. The primary focus is to develop an efficient DNN with a reduced number of parameters to make it real-time implementable. The architecture was implemented on GTSRB. Four variations of Neural network architectures; Feed Forward Neural Network (FFNN), Radial Basis Function NN (RBN), Convolutional Neural Network (CNN), and Recurrent Neural Network (RNN) are designed. The various hyper-parameters: Batch Size, Number of epochs, Momentum, Initial Learning Rate of the architectures, are tuned to achieve the best results. Extensive experiments are performed to study and improve the effects on efficiency. The effects of other techniques such as validation split (0.1 and 0.2) and data augmentation are also investigated. All results are tabulated to learn the effects of different techniques. The best performing model was selected as the real-time implementable architecture of our research. Four pre-trained models, namely LeNet, GoogleNet, ResNet, and AlexNet, were also implemented on the same database for comparative studies. Various other schemes of other researchers have also been provided. The comparative studies prove the supremacy of our proposed architecture.

Keywords: Traffic sign recognition, DNN, Validation split, Pre-trained models, Neural network

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Providing Security to Land Record with the computation of Iris, Blockchain, and One Time Password

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Abstract:

Out of many problems regarding land recording, so many fraudulent methods can be applied to obtain the records from the virtual storage system. The factors related to it might vary from time to time and place to place, but one of the common and vital ones would be the lack of security for such sensitive records. To reduce the severity of a secure storage system for these records, implementation of user authentication can assist as an additional security policy in case of land details theft. Unlike these conventional methods, the land record would be encrypted with an asymmetric algorithm, where the implementation of common reformations in technology, especially in security can be referred blockchain for data safety, iris recognition and OTP for authentication can notify the record owner about any kind of illegal activities on the secured records. And in terms of encryption, the asymmetric key policy is referred to with blockchain technology to encrypt the land records.

Keywords: Blockchain, Iris Recognition, Biometric authentication, OTP, Land Record Management.

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Car Buying Criteria Evaluation Using Machine Learning Approach

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Abstract

People in the modern world are looking for a lifestyle that is fast and easy. In the field of transportation, people have invented cars and these cars are almost seen to be owned by everyone and one is trying to purchase one. Each of these cars has different features and based on these features, people try to analyze the move towards purchasing it. Hence, in this research work, the author builds a classification model that classifies whether a customer is going to buy a car with specific features. This research work is consisting of four machine learning models with their result analysis. These classifying models are Gaussian Naïve Bayes, Decision Tree, Karnough Nearest Neighbors and Neural Networks. We also try finding the best hyper-parameter value to obtain the best result from these models. These results are used to compare the accuracies of every model and decide the best model to be used in real-time prediction. Here, the author was predicting whether a customer is going to buy a car or not buy a car with particular features available in it. Hence, for this prediction, the best accuracy we get is 97.4% which is given by the Decision Tree classifier. Also, the neural network gives around the same accuracy for the prediction. Therefore, this Machine Learning model can be used by the firm whether a new car with specific features will be sold in good quantity or not or by a customer to know whether a particular car is bought by other customers as well.

Keywords: Cars, classification model, Gaussian Naïve Bayes, Decision Tree, Karnough Nearest Neighbors, Neural Networks, Hyper-parameter.

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An Improved Gossip based Adhoc On-Demand Distance Vector protocol for Efficient Neighbor Node Discovery

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Abstract:
Recently, Mobile Low Duty Cycle Wireless Sensor Network (MLDC-WSN) is being widely used in many areas, due to the rapid development in the fields of wireless communication and microelectronics. In MLDC-WSN, node localization is important in many applications such as underwater sensor networks, monitoring of objects in outdoor and indoor environments. The major requirement in node localization is to allocate a location to every sensor node since multiple nodes in MLDC-WSN is utilized for retrieving sensitive information. The main aim of this research study is to address the localization issues using improved gossip-ad-hoc on-demand distance vector protocol for an efficient neighbor node discovery. The improved gossip protocol enhances the neighbor node detection by eliminating redundant information and the Ad-hoc On-Demand Distance Vector (AODV) routing protocol is used to effectively transmit the information from a source node to the base station. In addition to this, the improved gossip-AODV protocol significantly prevents the issues created by the clock drift of the nodes. Though, delay during the data transmission is reduced by avoiding the clock drift issue. The improved gossip-AODV has reduced discovery delay of 0.05, energy consumption, and wakeup time better as compared to the existing Selective Proactive wakeup fast Neighbor Discovery (SPND) method.

Keywords: Ad-hoc on-demand distance vector, Gossip protocol, Neighbor discovery, Node localization,Wirelesssensornetwork

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Categorization Model for Parkinson's Disease Occurrence and Severity Prediction

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Abstract

Machine learning and AI centre on empowering PC programs naturally to build their exhibition at certain undertakings through old experience. Healthcare is one of a zone where the utilization of AI can be exceptionally useful. This work depicts the investigation of a few AI procedures for medical healthcare. There is one region, which centres on quick pace improvements which promises outcomes as well as expand the ease of use, it is AI. AI answers a large number of the old and new healthcare difficulties; AI is comprehensively examined by different scientists and medical professionals. In any case, this field is exceptionally basic and, in any event, healthcare provides wide application. Here, this part introduces a review of healthcare and how AI can be utilized to help diagnose.

In the case of medical diagnosis, many information-based frameworks are utilized to computerize various activities. For physical impairment-based diseases such as Parkinson's disease, models are generated using gazettes, questionnaires, surveys, puzzles, activities etc. These Knowledge-based frameworks can collaborate with AI and machine learning techniques. AI calculations help in mechanizing the tedious procedure of information assembling that is fundamentally for the improvement of the information-based framework.

Machine learning and AI empowers PC programs consequently to expand their presentation for certain assignments through old information. This field is generally identified with measurable derivation and example acknowledgement. A decent effect of research in AI is centre around characterization, the activity of model advancement, from a lot of recently ordered models, which can accurately sort new models from the equivalent dataset.

Parkinson disease (PD) is most typical to handle and irreparable loss cannot be recovered just by medication. Even severity of the same can damage the person and quality of life degrades drastically. Early diagnosis of Parkinson's will be helpful for the elderly person. If examined later this ailment can become hopeless. Henceforth, evaluating the illness at an early stage is critical. Diagnosis of the disease can be done using three major activities. Motor movement, behaviour and Voice impairment. This chapter introduces the investigation for the finding of Parkinson's diagnosis using different ML (Machine Learning) for categorization and severity prediction through the measure of 16 voice and 8 kinematic feature information accomplished from various archives. The data set includes 40 people with Parkinson's disease and healthy patients generated with the help of spiral drawings and voice readings. Various machine learning algorithms estimate, including the highest accuracy (94.87 percent) demonstrated by ANN, while Naïve Byes has indicated the least precision (71.79%). The work also predicted severity scores by suggesting some scientific measures with a prototype dataset.

Keywords: Voice dataset, Kinematic features, Parkinson's disease, SVM, ANN, Random Forest.

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Requirements Identification on Automated Medical Care with Appropriate Machine Learning Techniques

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Abstract:

Generally, medical diseases can be identified based on their symptoms already derived. Most of the medical diseases are not new and the symptoms are already plotted with results. The diseases like COVID19 are new and it is still in the observation stage. Whenever the symptoms are conceivable such as, the demand for automation in prediction exists. Such demand leads to the development of automated medical care machine which can deliver the suggestions or prescriptions in absence of doctors due time or place constraints (now it is higher due to COVID19 pandemic). In a few situations, doctors can also help patients with live video streaming assist mechanism. The automated machine can also produce the required medicine as per the basic needs. Many research papers are coming up on this aspect now a day. It is important to focus on this medical need on the way of researches done and the room to improve further shortly. When dealing with such automated prediction, the previous predictions and results happened should be taken into considerations. In such case, the big data with machine learning algorithms play a vital role in this process. In this article, the best-fit machine learning algorithm was identified for medical related data sets.

Keywords: Automated Medical Care Machine, Video Streaming Assist Mechanism, Medical Diseases, Prescriptions and Medicine, COVID19 pandemic.

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Impact of Optimized Segment Routing in Software-Defined Network

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Abstract

Software Defined Network (SDN) tends to provide an agile and flexible network. Segment Routing (SR) protocol uses a source to receiver sensible way and is made out of a succession of fragments as a compelling routing procedure. Each section is spoken to by a centre point. Combining the SR and SDN can result in the separated requirements of clients and can rapidly send applications. In this research chapter, the authors have tried to explain the impact of SR in SDN. For this, authors have implemented two algorithms known as Multi-Objective Particle Swarm Optimization (MOPSO), Advance MOPSO (A-MOSPO) and Minimum Interference Routing Algorithm (MIRA) on a Waxman Network Topology created randomly having 100 nodes. For performance evaluation, MATLAB and the parameters such as throughput, link utilization, and delay have been taken as the key parameter for evaluating these above protocols in the SDN environment.

Keyword: SDN, MOPSO, A-MOPSO, MIRA, SR

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Detection of Zero-Day Attacks in Network IDS through High Performance Soft Computing

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Abstract:
The ever-evolving computers has its implications on the data and information and the threats that they are exposed to. With the exponential growth of internet, the chances of data breach are highly likely as unauthorized and ill minded users find new ways to get access to the data that they can use for their plans. Most of the systems today have well designed measures that examine the information for any abnormal behavior (Zero Day Attacks) compared to what has been seen and experienced over the years. These checks are done based on a predefined identity (signature) of information. This is being termed as Intrusion Detection Systems (IDS). The concept of IDS revolves around validation of data and/or information and detecting unauthorized access attempts with an intention of manipulating data. High Performance Soft Computing (HPSC) aims to internalize cumulative adoption of traditional and modern attempts to breach data security and expose it to high scale damage and altercations. Our effort in this paper is to emphasize on the multifaceted tactic and rationalize important functionalities of IDS available at the disposal of HPSC.

Keywords: High Performance Computing; Intrusion Detection System; Soft Computing; Fuzzy Logic; Neural Network; Zero Day Attacks

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PSO based Hybrid Weighted k-Nearest Neighbor Algorithm for Workload Prediction in Cloud Infrastructure

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Abstract

Elasticity in Cloud Infrastructure is used to take huge computation and repository demands effectively. Since the load in cloud environments varies from time to time that will be the obstacle to providing guaranteed Quality of Service (QoS) to end-users. The workload prediction in cloud environments improves the proper utilization of resources and service level agreement at a stable level. Hence, Particle Swarm Optimization (PSO) based Hybrid Wavelet Weighted k-Nearest Neighbors (PHWkNN) algorithm is proposed to predict workload in Cloud Data Centre. This algorithm combines Wavelet Transform with a Weighted kNN algorithm and seeing weights to get better accuracy of workload prediction. PSO algorithm is utilized as a Parameter Optimization algorithm to find the best possible values for the parameters in HWkNN model. The leave One Out Cross-Validation (LOOCV) method is adopted to validate the accuracy of the proposed model. In addition, it helps to adjust the weight value of the proposed algorithm and avoid premature convergence concurrently. However, Google CPU and Memory workload dataset are used to assess the accomplishment of the proposed algorithm. The evaluation outcomes demonstrate that PHWkNN algorithm is better than ANN and KSVR algorithms in the accuracy of the workload prediction.

Keywords: Cloud Infrastructure, k-Nearest Neighbor, Particle Swarm Optimization, Load Prediction, Wavelet Transform

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Detection of Zero-Day Attacks in Network IDS through High Performance Soft Computing

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Abstract:

The ever-evolving computers has its implications on the data and information and the threats that they are exposed to. With the exponential growth of internet, the chances of data breach are highly likely as unauthorized and ill minded users find new ways to get access to the data that they can use for their plans. Most of the systems today have well designed measures that examine the information for any abnormal behavior (Zero Day Attacks) compared to what has been seen and experienced over the years. These checks are done based on a predefined identity (signature) of information. This is being termed as Intrusion Detection Systems (IDS). The concept of IDS revolves around validation of data and/or information and detecting unauthorized access attempts with an intention of manipulating data. High Performance Soft Computing (HPSC) aims to internalize cumulative adoption of traditional and modern attempts to breach data security and expose it to high scale damage and altercations. Our effort in this paper is to emphasize on the multifaceted tactic and rationalize important functionalities of IDS available at the disposal of HPSC.

Keywords: High Performance Computing; Intrusion Detection System; Soft Computing; Fuzzy Logic; Neural Network; Zero Day Attacks

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Development of Health Care System Using Soft Computing Methods

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Abstract

Real-world problems associated with the health care domain are dynamic and non-deterministic. Traditional analytics models are no longer effective for diagnostic processes and frequently require a large amount of computation time for decision making, which cannot be sustainable in a technology-driven world. Soft computing methods, such as neural networks, machine learning, fuzzy logic etc., not only deal with the existing environment but are also highly self-adaptive in terms of predicting and classifying new diseases that appear in the existing environment. As a result, these techniques are extremely beneficial and effective for use in the healthcare system.

Keywords: Erythemato Squamous Diseases, Soft Computing Techniques, Neural Networks, Ensemble

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Spear-Phishing Emails Verification Method based on theVerifiable Secret Sharing Scheme

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Abstract:

Phishing is a critical cybersecurity issue that differs from otherattacks. This attack practices social engineering techniques to prompt users todisclose their credentials. Spear phishing is an advanced version of phishingattacks where the attacker investigates the online behavior of an individual ororganization to gather the information for constructing an email that appears tobe legitimate. As a result, spear-phishing holds a high success rate thantraditional phishing emails since these emails can evade the standard securitybarriers and harvest the credentials. This paper presents an abstract method thatcollects features from different dimensions: phishing domain features,stylometric features, and others to detect spear-phishing emails. Theauto-upgrade profile is additionallysupplemented by the method to detectphishingemailswithinasecond.Finally,themethodemploysamachine-learning algorithm to classify spear-phishing emails from legitimateemails. This paper owns the uniqueness of detecting traditional phishing emailsas well as spear-phishing emails using multi-dimensional features. Finally, thispaper applied the publicly verifiable secret sharing to verify the email whetherthe sender is genuine or not.

Keywords: Spear Phishing, phishing, Social engineering, Machine learning algorithm, author's writing-style, cyber-security

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Route Mapping of Multiple Humanoid Robots Using Firefly Based Artificial Potential Field Algorithm in a Cluttered Terrain

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Abstract:

The hybrid outcome of the Firefly Algorithm (FA) and Artificial Potential Field (APF) algorithm for humanoid control is preferred in the present study for navigational tasks. Initially, the APF algorithm is procured with sensory input concerning the barrier range in a different direction, source points, and respective targets that give an intermediate steering angle. It is then fed to FA to obtain the ultimate steering angle as an output. FA guides the robot close (safest distance) to the obstacle and optimizes the footsteps to provide a better path. Simulations and real-time experiments are carried out for the motion of multiple humanoids in a cluttered terrain. Humanoid robots can manoeuvre comfortably from source point to target using the preferred algorithm. In the system containing multiple humanoid robots, one robot behaves like a dynamic obstacle to the other humanoids, leading to a conflicting situation during navigation. This situation is eliminated by the implementation of the dining philosopher controller in the base algorithm. The simulation and experiment result shows a good relationship with a deviation of under 6 %. Finally, the established trajectory planning algorithm is also tested in contrast to the existing navigational model.

Keywords: Humanoid NAOs, Dinning philosopher controller, Artificial potential field, Firefly algorithm, Conflicting situation, Navigation.

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Survey of Context Aware Activity Recognition System

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Abstract:
Elderly and disabled person activity recognition in smart home application is actively pursued for accessing changes in physical and behavioural problem of home dwellers. Various activity recognition solutions have been before proposed to implement system with wearable device and smartphone. Although such solutions are mostly integrated, the availability of the activity data in seamless way still interesting research challenges. Internet of Things (IoT) is seen as new epitome, revolutionizing consumer electronics by extending Internet connectivity to many physical device associated with elderly and disabled person daily life. In this paper, an Internet of Things (IoT) based on activity recognition system is proposed for activity monitoring within elderly and disabled person home. Falling is a commonly occurring issue with elderly people and disabled persons, which may cause serious injuries.

Keywords: Internet of Things, elderly and disabled person activity recognition, Machine Learning/Deep Learning, cloud platform.

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Sarcastic Sentiment Detection and Polarity Classification of Tweets Using Supervised Learning

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Abstract

Nowadays, due to the rapid growth in web technologies and internet usage, there is an enormous amount of data available in WWW and also growing progressively. The data includes online learning, exchanging ideas and opinions, etc. People are using social networking websites such as Twitter, Facebook, Instagram, Google+ as a common platform for all these. These platforms nowadays have become very popular as they permit people to share and exchange their views about any topics/events and have been considered by the researchers for sentiment analysis, opinion mining, text summarization, question answering etc. In this paper, we proposed an approach to classifying the tweets into sarcastic and non-sarcastic sentences. Initially, Twitter data is pre-processed and feature extraction is done that considers n-grams, POS tags, term position and frequencies. Further, the approach uses machine learning and deep learning algorithms for identifying sarcasm in tweets. Further, the classification algorithms such as Navy Bayes, Decision Tree, Random Forest and CNN's used to classify the polarities of non-sarcastic sentences. The experimental results are promising with good classification accuracy.

Keywords: sarcasm, Sentiment Analysis, Polarity, Classification, Tweets, CNN

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A Study on Machine Learning Techniques for Churn Prediction in Telecommunication Sector

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Abstract:
In the field of telecommunication, on a daily basis a large amount of data is being generated due to a large number of user base. New users are more expensive to acquire than existing users, according to decision makers and business analysts. Business analysts and customer relationship management (CRM) analysts need to understand why customers churn, as well as the behaviour patterns that can be gleaned from existing churn data. In this paper we proposed a churn prediction model that uses classification and clustering techniques to identify the churn users and presents the factors behind the churning of users in the telecom sector. We have used the information gain and correlation attribute ranking filter to choose features. The suggested approach initially uses classification methods to classify churn customers' data, with the Random Forest (RF) algorithm performing particularly well, with 88.63 percent of cases properly categorised. In order to avoid churners, the CRM must create effective retention strategies. Following classification, the suggested approach divides the data of churning customers into groups using cosine similarity in order to deliver group-based retention offers. This study also revealed churn characteristics that are crucial in determining churn's core causes.

Keywords: Customer relationship management; customer churn; Machine learning.

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Skin Cancer Classification: Analysis of Different CNN Models Via Classification Accuracy

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Abstract

Skin cancer is the most common form of cancer, which can be best treated if detected early. The main objective is to apply deep learning neural networks to discover the relevant patterns which can help to guide the classification accurately. The paper has considered the well-known deep learning model that is the convolutional neural network and compared the accuracy of the model by applying a vast dataset by varying the parameters such as the number of layers, activation functions etc. to find the best suitable parameters for CNN to design the classifier that could give the best accuracy while classifying the images of the seven types of skin cancer. Lastly, the results achieved 84.31% accuracy in classification and also models where Resnet application, CNN model gave an accuracy of 99.22%.

Keywords: Skin cancer, CNN, Classification, Resnet, Deep learning

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Detection and Prevention of Blackhole Attack in AODV of MANET

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Abstract:
One of the most dynamic network is the Mobile Adhoc (MANET) network. It is a list of numerous mobile nodes. Dynamic topology and lack of centralization are the basic characteristics of MANET. MANETs are prone to many attacks due to these characteristics. One of the attacks carried out on the network layer is the blackhole attack. In a black-hole attack, by sending false routing information, malicious nodes interrupt data transmission. There are two kinds of attacks involving a black-hole, single and co-operative. There is one malicious node in a single black-hole attack that can act as the node with the highest sequence number. The node source would follow the direction of the malicious node by taking the right direction. There is more than one malicious node in the collaborative black-hole attack. One node receives a packet and sends it to another malicious node in this attack. It is very difficult to detect and avoid black-hole attacks. Many researchers have invented black-hole attack detection and prevention systems. In this paper, We find a problem in the existing solution, in which validity bit is used. This paper also provides a comparative study of many scholars. Thesource node is used to detect and prevent black hole attacks by using a binary partition clustering based algorithm. We compared the performance of the proposed solution with existing solution and shown that our solution outperforms the existing one.

Keywords: ***MANET, AODV, Black hole attack, routing, protocols, clustering***

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Algorithmic Aspects of k-Secure Domination in Graphs

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Abstract

The theory of domination in graphs has good applications in wireless sensor networks, social networks and biological networks. Due to this, several new concepts such as independent domination, connected domination, restrained domination, etc. are studied. With this motivation, we define a new domination parameter called k-secure domination. A set $S \subseteq V(G)$ is a k-secure dominating set if $\forall\ S_1 \subseteq S$ with $1 \leq |S_1| \leq k$, $\exists\ S_2 \subseteq V(G) \setminus S$ such that $|S_1|=|S_2|$, $G[S_1 \cup S_2]$ has a perfect matching P with each edge of P has one end in S_1 and another end in S_2 and also $(S \setminus S_1) \cup S_2$ is a dominating set of G. The minimum cardinality of a k-secure dominating set in G is called k-secure domination number of G. In this paper, we give preliminary results related to this new parameter. We also study the computational complexity of k-Secure Domination (k-SDM) in some important graph classes.

Keywords: Secure domination, Securely connected domination, NP-complete, Corona product.

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A Three-Pronged Approach to Mitigate Web Attacks

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Abstract:
In recent days, one of the popular Web servers used by the majority of Web sites in the globe is Apache. Furthermore, lack of proper tuning of these Web servers causes delay in the network by 40% approximately. The present digital world depends upon Web applications to deliver its functionality. Economies, governments, organizations, and ultimately people rely heavily on the performance of the Web applications. Hence, in real time, the practical problem arises in tuning of the Web servers. The Web servers and poor coding of Web applications are the source for the vulnerabilities in the Web. In this, paper focuses on defending the vulnerabilities in Web applications deployed on Apache Web server through protecting the HTTP header and implementing the secured configuration of Apache Web server and ModSecurity Web application firewall.

Keywords: Vulnerabilties, ModSecurity, Apache Web attacks, Web browser misconfiguration.

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Secure Connected Domination in Graphs: Revisited

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Abstract

Let $G = (V, E)$ be a simple, undirected and connected graph. A connected dominating set $S \subseteq V$ is a secure connected dominating set of G, if for each $u \in V \setminus S$, there exists $v \in S$ such that 11 $(u,v) \in E$ and the set $(S \setminus \{v\}) \cup \{u\}$ is a connected dominating set of G. The minimum size of a 12 secure connected dominating set of G denoted by $\gamma_{sc}(G)$, is called the secure connected domination 13 number of G. Given a graph G and a positive integer k, the Secure Connected Domination (SCDM) 14 problem is to check whether G has a secure connected dominating set of size at most k. In this paper, 15 we prove that the SCDM problem is NP-complete for undirected path graphs, a subclass of chordal 16 graphs. On the positive side, we give a polynomial-time algorithm to calculate secure connected 17 domination number of proper interval graphs. Moreover, we show that the connected domination 18 and securely connected domination problems are not equivalent in computational complexity aspects.

Keywords: Secure domination, Securely connected domination, NP-complete, Corona product. *2010 MSC:* 05C69, 68Q25

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AN INTELLIGENT HOME ASSSISTANT SYSTEM

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Abstract:

Voice Based Home Automation System using Raspberry Pi is the project which will be very useful for old age people and disabled people, basically for one's who cannot perform basic activities efficiently. It is the idea which corresponds to the new era of automation and technology. The main aim of the home automation system is to make life easier by moving bot around home. Mobile devices are very common among everyone due to its user friendly interface and portability features. In this project we aim to control electrical home appliances by voice commands using Wi-Fi as communication protocol between Raspberry Pi and Android device. Raspberry Pi 3 becomes a better option for home automation via internet due to its feature of inbuilt Wi-Fi and Bluetooth.

Key Words: Home Automation, Raspberry Pi, voice commands, internet, inbuilt Wi-Fi and Bluetooth.

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An Empirical Analysis of Intrusion Detection in Cyber-Physical Systems using Machine Learning

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Abstract

In this digital period, the internet has turned into an indispensable wellspring of correspondence in just about every call. With the expanded use of system engineering, its security has developed to be an exceptionally discriminating issue as the workstations in distinctive associations hold very private data and touchy information. The system which helps in screening the system security is termed Network detection. Intrusion detection is to get ambushes against a machine structure. One of the vital tests to Intrusion Detection is the issue of misjudgement, misdetection and unsuccessful deficiency of steady response to the strike. In the past years, as the second line of boundary after firewall, the Intrusion Detection (ID) strategy has got a speedy progression. Two diverse Machine Learning techniques are prepared in this research work, which includes both supervised and unsupervised, for Network Intrusion Detection. Naive Bayes (supervised learning) and Self Organizing Maps (unsupervised learning) are the presented techniques. Deep learning techniques such as CNN is used for feature extraction. These remain provisional chances adaptation technique and pointer variables transformation. The two machine learning procedures are prepared on both kinds of transformed datasets and afterwards their outcomes are looked at with respect to the correctness of intrusion detection. The best Detection Rate (DR) was for the 93.0% User to Root attack (U2R) attack type and the most horrible result was displayed for Denial-of-Service attack (DOS) attacks with 0.02%.

Keywords Autonomous networks. Wireless. Security. Trust. Detection of intrusion

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Accurate Detection and Diagnosis of Breast Cancer Using Scaled Conjugate Gradient Back Propagation Algorithm and Advanced Deep Learning Techniques

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Abstract:
Development of breast cancer detection and its usage by different health care industries in their diagnostic center is a very much serious task for classifying cancer cells based on its specific characteristics. As a consequence, the classification process of the cancer becomes incredibly complicated for the potential users because they have a large set of attributes and parameters of the cancer cells which are available at their disposal in laboratory for diagnosis. Moreover, the proposed work gives the efficient decision for the classification of the cancer cells to diagnose the patients at there earlier stage of breast cancer. Design Methodology/approach: In this chapter, it has been proposed a layered neural network model which uses this back propagation algorithm along with scaled conjugate gradient for optimized way of classification of cancer cells by considering the appropriate parameters. Findings: The classification of cancer cells is evaluated using the proposed algorithm by designing a layered neural network model. For training the model, 70% of instances are used, for verification, 15% instances and for testing, 15% instances are used of 699 samples. After successful training of the model, the model classifies the cancers as benign (2) or malignant (4). Originality/value: The proposed methodology is an original scientific work and the algorithm used is an efficient algorithm for the classification of cancer cells. In this work, eleven data attributes are used for the classification from cancer data set.

Keywords: -Back propagation, Breast cancer detection, Neural network, Scaled conjugate gradient.

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An Experimental Study of Vulnerability Assessment and Penetration Testing on Cyber-Physical Systems

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Abstract

Now a day's most people and organizations are depending on computer machines to store confidential information and transmit messages over the network. There is a chance of unauthorized access to confidential information by hackers. Vulnerability assessment and penetration testing is the most powerful service for auditing, reporting, information gathering and patches for web applications. Vulnerability assessment and penetration testing are two different approaches (internal and external) to assess the security behaviour of an information's network. This paper proposes a Nmap security assessment tool, it is a free and open-source utility for network discovery and security auditing. Nmap (Network mapper) uses raw IP packets in a novel way to determine the availability of hosts on the network infrastructure and it also includes the host discovery, TCP pings, ICMP messages and vulnerability analysis tools.

Keywords: Vulnerability assessment, Vulnerability exposures, Nmap, ICMP.

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Visual Assistance For Visually Impaired People Using Image Caption and Text To Speech

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Abstract:
Picture captioning has recently become a new difficult challenge that gathered everyone interest, which is being able to automatically define an image's content with properly formatted text English sentences. it can make a great impact by assisting people who are visually impaired better recognition of their circumstances. By taking the images of surrounding environment then make use of these photos to generate captions that can be read out visual amplification impaired, so that they can get a better sense of what's going on around them. In this paper to extract features, we used a combination of convolutional neural networks of the images and then LSTM was used (Long short-term memory) to generate text from these features. The obtained text is then converted into speech so that it can be read out. Our model generates highly descriptive captions that can potentially greatly improve the lives of visually impaired people.

Keywords: Xception,,LSTM,intellegence

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Conceptual Understanding of Blockchain: Implications for Supply chain, Finance and Accounting

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Abstract:

Blockchain is a term widely used to represent a suite of technologies. Much like the early internet, blockchain has the potential to fundamentally change the way the industry works, causing a big paradigm shift in how money, goods and digital assets move around the world. Right from its initial use case as an underlying technology for various cryptocurrencies, it is now being used in a plethora of application domains. The biggest challenge here is to identify the application domains where –blockchain-based solutions would be a good fit. Blockchain technology will benefit areas where information is distributed and decentralized, information stored is time-sensitive, and the security of data is important. Given these challenges, the two areas that emerge as good candidates and could benefit greatly from the technology include – Supply Chain, and Finance and Accounting. All these domains generate thousands of transactions each day. All the transactions require some form of verification and auditing. This paper suggests how the use of blockchain technology could reconcile transactions at a lower cost and can also be used to generate immutable audit trails to create a better identity system to improve the tracking of goods. This paper proposes a framework of how leveraging the power of blockchain technology could enable businesses to perform *costless verification* and in the long run reduce the cost of running a secure network.

Keywords: Audit-trail, Blockchain, Costless-verification, Immutability, Reconciliation, Supply chain, Transactions.

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Fuzzified Energy Efficient Mechanism (FEEM) in Wireless Sensor Network

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Abstract:
Wireless Sensor Network is one of the most rapidly developing technologies with a wide range of applications which includes a sensing process, security providence and surveillance, environmental sensing, and military applications. Significant trend led to the emergence of small and low-cost computation and communication devices, called sensor nodes. Sensors are capable of sensing and transmitting process by consuming some amount of energy. The devices have the potential to serve as a catalyst for major changes. FEEM (Fuzzified Energy Efficient Mechanism) is a clustering-based protocol proposed for continuous data-gathering with reduced energy consumption in WSN. The network is organized into clusters with cluster-heads periodically collecting, aggregating/compressing the data from nodes within the cluster, before sending them from Cluster head to Base station. Cluster-heads are changed periodically based on the Residual Energy available with the nodes in the cluster. The protocol is built based on the existing LEACH protocol to increase the lifetime of sensor network as well as to provide the energy efficiency at each node in WSN.

Keywords: Cluster Selection, Energy, Fuzzy, Lifetime

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Blockchain Architecture, Challenges and Opportunities: A Survey

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Abstract

Blockchain has gathered massive momentum in the past few years and is called by many researchers the disruptive technology that could revolutionize the internet. On a high level, blockchains are distributed ledgers that store information in blocks that are chained together using some cryptographic scheme. Transactions need to pass through the collective consensus before they can be added to the ledger. The technology offers numerous benefits like anonymity, privacy, security and auditability. There exists a wide spectrum of applications that stand to benefit from blockchain, namely, cloud computing, social service, IoT, finance to name a few. As the technological landscape of blockchain is expanding, it is ever so important to understand the core technologies that the blockchain has to offer and understand how parties that do not trust each other maintain consensus on a set of global states. This research paper focuses on providing a high-level technical overview of the impact of the core technologies that make up the blockchain. We conduct a comprehensive survey on the architecture, challenges and opportunities associated with the technology in three dimensions: design trade-offs, performance gaps and data processing capability. We study the commercial, financial and technical aspects of the technology. Drawing from these insights, we discuss several research directions that will bring blockchain closer to mainstream adoption.

Keywords: Blockbench, Blockchain, Cryptocurrency, Security, Smart Contract

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A Deep Belief Network-Based Machine Learning for Imputation Adoption of the Medical Dataset

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Abstract:

The research of missing value finding exist more than two to three decades but still the missing value imputation is a big challenge to maintain the integrity of the database. The missing value imputation can be of categorized as statistics oriented and non-statistics oriented. Statistics method of imputation has many drawbacks to tune or expect perfect imputation also it has number of limitations during execution. This reason is the hint of this work which we looked in terms of non-statistical practice called machine learning approach. Deep Belief Network (DBN) is one kind of Machine Learning unsupervised probabilistic generative model and is mainly constructed by stacking Restricted Boltzmann Machines that performs a contrastive divergence and then fine-tunes the weights by back propagation for the imputation process The contrastive divergences gives the reason to produce the stable imputation value with DBN. The PIMA medical dataset from UCI Repository used for experimentation. The DBM with back propagation show the imputation rate upto 90% of accuracy. This method(DBN) supports maximum of 10% mean square error rate compared with earlier imputation techniques. Almost five other imputation methods associated with DBN for accuracy assessment. The DBN imputation ensures the accuracy to 90% comparatively than other techniques.

Keywords: Machine Learning, Unsupervised Learning, Deep Belief Network, Imputation, Artificial neural networks.

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Analysis of increased block size on Blockchain Systems

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Abstract

Blockchain is a type of distributed ledger that draws its components from core computer technologies, namely distributed computing, encryption algorithm and consensus protocols. A good blockchain-based system should allow easy and faster verification of transactions if it must evolve into a mainstream public verification system. The biggest challenge here is the challenge of system scalability. Scalability is a metric that refers to the ability of the system to increase or balance its performance depending upon the load and the processing demands on the system. The success of any blockchain-based application is dependent on the kind of consensus algorithm is deployed. Consensus determines the ordering of the blocks in the chain as well as the performance and security of the system. Scalability is inadvertently tied to the consensus protocol the blockchain runs on. This paper determines how scalability is influenced by consensus algorithms and how by improving the consensus protocols we can improve the performance of the system. We make use of nature-inspired algorithms to determine the link between block size and scalability and propose how increasing or decreasing block size can influence the scalability of the system.

Keywords: Blockchain, block size, Consensus Protocols, Nature-inspired algorithms, Scalability

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An investigation on the effect of Superframe adjustment on energy consumption in IEEE 802.15.4 WBAN

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Abstract:

Wireless Body Area Network (WBAN) unlocks new avenues for state-of-the-art healthcare monitoring services because of its features such as consistent observation of the vital signs, low cost, and embedded with latest sensors and technologies. WBAN uses physiological sensors that have limited battery power whose consumption is directly proportional to the function of radio activities such as wake-up and sleep states of the nodes. IEEE 802.15.4 MAC is considered as a suitable protocol for healthcare monitoring applications. This paper presents a novel scheme that aims to prolong the lifetime of the sensor nodes by careful adjustment of the superframe duration in the beacon-enabled mode of this standard. The paper also presents a rigorous and detailed analysis of the energy consumption model of this standard under WBAN scenarios. Through intensive simulations, it is observed that suitable adjustments made in the superframe duration indeed helps in improving the energy efficiency.

Keywords: Wireless Body Area Network, Superframe Duration, Energy Efficient Protocol, Beacon-enable mode, Duty Cycle

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Middleware for Smart City using Docker Swarm

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Abstract

Smart cities consist of many producers and consumers/subscribers of data that require middleware to act as a broker between them. The smart city middleware is an enabling platform to facilitate the exchange of data between producers and consumers securely. One of the challenges in a smart city middleware is to scale it with the rising number of users. The goal is to propose and build a novel scalable architecture using the RabbitMQ message broker and study its various configurations. To address the scaling issue, this paper proposes the use of the Advanced Message Queuing Protocol (AMQP) proxies, which intelligently balance the load.

Keywords: Smart city, Middleware, Docker, AMQP

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PREDICT CRYPTOCURRENCY USING LSTM

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Abstract:

Cryptocurrency has always been an emerging area in recent years. It has been grabbing all the attention from the investors, researchers and also the media. The reason behind this is the cryptocurrency being decentralized. In this paper we will be predicting Bitcoin price. Bitcoin is one of the popular Cryptocurrencies. The main problem with predicting Bitcoin is that, the fluctuations in its price are very high. Sometimes the price goes really high and the other times it falls to a very low price. These sudden fluctuations create a difficulty in predicting the price of a bitcoin. And also bitcoins price depends upon many other factors as well. So because of all these it is a challenging to predict the price of a Bitcoin. As Cryptocurrency is decentralized, no centralized authority is there to look in to its transactions status and all. And it is also said that Reserve Bank of India is now interested in moving on to some new way of exchange. And is also interested in creating its own Cryptocurrency named "Lakshmi". So we thought, if we would have predicted cryptocurrency, it would give fruitful results. This paper contains the study of Cryptocurrency prediction using LSTM.Bitcoin dataset is taken from a source named cryptocompare.com and the model is build using LSTM. We use sequential model for building the system. This LSTM can capture the time-series data well and helps in predicting the values in an efficient way. We will also be having a glance at the loss & value loss that is occurring. Finally, we will see the comparison curve between the actual & predicted values and also the predicted price for today.

Keywords: Cryptocurrency,LSTM,Bitcoin,Prediction

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Hybrid Digital Watermarking for Images

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Abstract.

From our studies on multiple image and colour image watermarking, we have concluded that sometimes the robustness is affected. That is, the number of robustness tests the watermarked grey image passes with flying colours is slightly more than the multiple or the colour watermarked image. Due to the much more practical applications of the colour and multiple images watermarking the number of robustness should test that these passes be as many as possible. With this and other aspects being taken into consideration we would like to develop a hybrid digital image watermarking algorithm using SVD and other transformation technique which is more robust and can be used for various applications like source-based and destination-based watermarking technique.

Keywords: Watermarking, SVD, Hilbert Transform

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Performance Analysis of Energy Consumption Based Algo rithmic Approach Model to Enhance Battery Life

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Abstract:
One of the most intriguing topics over the past few years has been minimizing energy consumption in convenient gadgets and enhancing their battery life. The production of portable devices has made society's work more accessible and has increased comfort levels by using those devices to the maximum threshold. Batteries fuel such gadgets. Most of the companies invest their time, energy, and money looking for new ideas for increasing battery life, and most of these ideas are related to hardware. Their uptime subsequently depends on the vitality utilization of the parts and components. By exploring fresh approaches that empower frameworks to adjust powerfully at runtime, energy utilization can be effectively decreased. This article focuses on employing a portion of vitality administration that can dynamically select the most excellent calculation so that a battery can have maximum life and utilization. The analysis shows that quicksort is the first viable sorting approach when it comes to vitality sorting; For Minimal Spanning Tree: Prims, For Graph Searching: BFS and For Implementing and Searching Trees: RBT.

Keywords: CGS Optimization, Mobile Information Systems, Software Engineering, Adaptivity, Energy Awareness.

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Embedding Isolation and Blacklisting of Malicious Nodes in RPL for Efficient Security Management of IoT

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Abstract:

The constrained characteristics of devices in the Internet of Things (IoT) environment deters the implementation of robust security solutions. Consequently, intrusion of malicious nodes in IoT is a frequent phenomenon. Such malicious nodes often exploit the vulnerabilities of the underlying routing protocols to instigate several DDoS attacks. The IPv6 Routing Protocol for Low Power and Lossy Networks (RPL), popularly used in numerous IoT applications, is susceptible to several routing attacks. Various researchers have proposed mechanisms for detecting routing attacks and identifying malicious nodes in RPL-based IoT environments. However, the benefit of such mechanisms can only be harnessed when identified malicious nodes are quickly isolated from the IoT environment. Therefore, the removal of identified malicious nodes outweighs any other security measure. Malicious nodes, often located in remote locations, are difficult to dislodge at the earliest. This paper proposes to embed the isolation and blacklisting mechanism of suspected malicious nodes in the routing process itself. We propose upgrades in the existing RPL routing process to enable fair nodes to collaboratively weed out malicious nodes and restrict the spread of malicious activities in the IoT environment.

Keywords: RPL, Routing Security, Blacklisting, Isolating

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An Adequacy of SAFe philosophy on correspondence and joint effort with Schooling Oriented Projects

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Abstract:
The purpose of this study was to focus on how the implementation of agile methodologies in the field of schooling can affect a project's outcome and to evaluate the existing research beliefs that were based on surveys and interviews versus using real-world project data. The reason for this investigation was to zero in on how the execution of coordinated techniques in the field of substantial common development can influence a task's result and to assess the current examination convictions that depended on studies and meetings as opposed to utilizing genuine venture information. The initial segment of this examination was to acquire a comprehension of where the development business is concerning dexterous execution, what studies have been performed to date, and what light-footed strategies have been resolved to be most appropriate in the field of development. Then, the center went to distinguishing what Key Performance Indicators have been set up to precisely "score" a development project for execution and to discover scoring strategies utilized in the field of development to demonstrate a venture's prosperity or disappointment. Having strong exploration diary sources to build up these basic beginning stages was basic to assess real world information from development extends that utilized nimble procedures for correlation with those that utilized conventional methodologies.

Keywords—agile methodologies; substantial; real-world; exploration.

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Mind Map-based Vulnerability Assessment of IPv6 Routing Protocol for Low Power & Lossy Networks

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Abstract

A Mind Map is a graphical representation of concepts and ideas that help in structuring and comprehending information. Mind Map facilitates better analysis and recall of information as well as the generation of new ideas. The motivation behind our proposed Mind Map-based Vulnerability Assessment of RPL is two-fold. First, the existing literature does not focus on partitioning attacks in RPL-based IoT-LLNs. Second, we need to explore the vulnerabilities associated with each step of the RPL routing process as it may aid in better preparedness for unknown or Zero-day attacks. A malicious actor can also exploit the vulnerabilities of the routing process, i.e., the steps involved in the topology formation. To this end, we examine the RPL routing process's vulnerabilities through the proposed Mind Map-based model. The Mind Map model examines the working of the RPL routing process in detail and explores the associated vulnerabilities. Based on the understanding gained from the vulnerability assessment models, we analyze the symptoms and impact of various routing attacks in RPL-based IoT-LLNs and define their threat models.

Keyword: RPL, IoT, Vulnerability Assessment, Mind Map

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Information Collection Context for Energy Cost-effective Secrecy Preservation in Wireless Sensor Networks Having Many-to-Many Methods

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Abstract:
Remote sensor organizations (WSNs) by and large have a many-to-one design so occasion data streams from sensors to an extraordinary sink. In ongoing WSN applications, many-to-numerous designs advanced because of the requirement for passing on gathered occasion data to different sinks. Security safeguarded information assortment models in the writing don't take care of the issues of WSN applications in which organization has various un-confided in sinks with various degree of protection prerequisites. This investigation proposes an information assortment structure bases on k-namelessness for forestalling record revelation of gathered occasion data in WSNs. Proposed strategy thinks about the namelessness necessities of various sinks by giving various degrees of security to every objective sink. Qualities, which may distinguish an occasion proprietor, are summed up or scrambled to meet the distinctive obscurity prerequisites of sinks at the equivalent anonymized yield. On the off chance that a similar yield is framed, it very well may be multicast to all sinks. The other inconsequential arrangement is to deliver distinctive anonymized yields for each sink and send them to related sinks. Multicasting is an energy proficient information sending elective for some sensor hubs. Since minimization of energy utilization is a significant plan models for WSNs, multicasting a similar occasion data to numerous sinks diminishes the energy utilization of by and large organization.

Keywords: secrecy Preservation, Energy efficient, wireless sensor networks.

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Enhanced Attention based Network for Medical Image retrieval

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Abstract

In the field of biomedical imaging, there is a large increment in biomedical data because of the use of advanced techniques like X-ray, magnetic resonance imaging, computed tomography. This causes difficulty in managing and querying these large databases leading to the need of content based medical image retrieval (CBMIR) systems. A major challenge in CBMIR systems is the semantic gap that exists between the low-level visual information captured by imaging devices and high-level semantic information perceived by human. To solve this problem, an Enhanced Attention based Network for image reconstruction is proposed for medical image retrieval. Attention mechanism is used in the proposed network to suppress feature redundancy and enhance feature learning ability. The proposed method encodes the input image into a set of features using self-attention mechanism followed by up-convolution operation in the expansive path in decoder for reconstruction of the input image from the encoded features. The robust reconstruction of the input image from encoded features shows that the encoded features can be used as an abstract version of an input image. Average retrieval rate and average precision rate are used to evaluate the performance of proposed and existing state-of-the-art methods for medical image retrieval task with the help of three benchmark medical image databases.

Keywords: Self-Attention · Adversarial Networks· Image Reconstruction · Index Matching.

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Face Hallucination Methods - A Review

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Abstract:
Face Hallucination is the method specifically used for faces which inherit super-resolution technique. Face hallucination helps to get a high-resolution image from a low-resolution image. Applications of this technique are image enhancement and face recognition security. Face Hallucination became a widely used application in the identification of facial images in all the fields. In this paper, numerous approaches and methods used for face hallucination were discussed. A contemporary analysis was made using various approaches for enhancing low-resolution images to high-resolution images. Super-resolution technique is a potential application in face recognition system which is an active research area nowadays.

Keywords: Face Hallucination, super-resolution, image enhancement, face recognition.

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Biomedical Image Retrieval Using Quantized Local Neighbourhood Patterns Using Sign and Magnitude

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Abstract

Image indexing and retrieval is still exploratory and, despite an improvement in the field of multimedia image retrieval, many challenges remain to increase the accuracy of the system. The proposed work introduces a new approach to improve accuracy of the medical image retrieval system by extracting more information from an image. Existing research primarily focuses on collecting the information from the pixels of whole image. Further, there is a little evidence that researchers have focused on the usage of magnitude to extract more texture information from the image. We present an integrative framework that collects more information from the image in an effective manner which is less sensitive to Gray level variations due to its discriminative information as well as more robust against illumination changes. Very specifically, two novel texture patterns for medical image retrieval system named Quantized local neighbourhood sign pattern (QLNSP) and Quantized local neighbourhood magnitude patterns (QLNMP) are proposed. QLNSP depends on the relative intensity difference and QLNMP uses the mean deviation calculated according to a preset threshold value for this purpose. As a result of unique method of extraction, proposed framework yields better results in medical image retrieval. Resultant descriptor is used for medical image retrieval on two databases (MRI, CT). Four types of distance metrics are employed to test the effectiveness of the proposed method. The proposed method. Robustness, efficiency of the proposed system is evaluated by means of Precision and Recall metrics.

Key words: Image retrieval, Quantization, Neighbourhood, Local patterns

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A Novel Genetic Algorithm with 2D CDF 9/7 lifting discrete Wavelet transform for total target coverage in WSNs deployment

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Abstract:
In recent days, environmental monitoring has been achieved by wireless sensor networks. The node placement problem is playing a significant role in positioning and infrastructure for gathering information from engineering and environment fields. When the number of sensors is limited to cover the maximum area or total target coverage (TTC) imposes a real challenge in sensor placement in a different field because of complicated weather condition, the quality of maximum coverage is achieved by deploying sensors in an optimum position such that it covers the entire field. In this paper, a novel genetic algorithm with a 2D lifting-based discrete wavelet transform is proposed for finding the optimal location for each sensor with connectivity. The enhanced genetic algorithm generates the population matrix to identify each sensor position whereas, the quality of maximum coverage or monitoring and connectivity of every sensor is achieved by a 2D lifting scheme based on bi-orthogonal Cohen-Daubechies-Feauveau CDF 9/7 wavelet transform for adjusting sensor position optimally. The theoretical analysis and mathematical model have been carried out to the simulation results and are compared with the existing algorithm in terms of maximum coverage, connectivity, the total number of sensors and optimal position.

Keywords: Wireless sensor network; WSN; sensor deployment; lifting scheme; genetic algorithm; wavelet transform; total target coverage; TTC.

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Smart Home Application for Visitor Face Detection Through SMS Notification

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Abstract

With the advancement of artificial intelligence, smart home security devices are widely used and become a necessity. Now-a-days machines are able to automatically verify identity of a person for secure transactions, surveillance and security tasks and for access control to buildings etc. Existing work uses Haarcascade for face detection which are prone to false positive detections. We are proposing a combination of HOG and SVM algorithm using Dlib libraries for face detection to recognize the visitors coming to house by displaying the name of the person and by sending an SMS alert about the visitor. Voice modules are embedded to alert the people about the visitor information through smart tv or smart phone. The proposed system is trained on a database of 250 images and videos of 50 families and tested on 180 images. Proposed system outperforms by giving better accuracy when compared to existing algorithms.

Keywords: Face detection, SVM, HOG,Open-C

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Hybrid Genetic Algorithm with Haar Wavelet for Maximum Target Coverage Node Deployment in Wireless Sensor Networks

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Abstract:
Wireless sensor networks (WSNs) are used in industrial applications and focused on target coverage and node connectivity based WSNs. The set of sensors and targets is placed in optimal position the target coverage and node connectivity achieving maximum with limited senor nodes. To resolve this problem, the proposed hybrid genetic algorithm combined with lifting wavelet multi-resolution principles for recognizing optimal position for sensors to cover entire targets present in the fields. The hybrid genetic algorithm randomly identifies each sensor position and 2D Haar lifting wavelet transform to improve the quality of target coverage by adjusting node position. The 2D Haar lifting decomposes the population matrix into the optimal position of sensors. Experimental results show the performance of the proposed hybrid genetic algorithm and fast local search method compared with available algorithms improves the target coverage and the number of nodes with varying and fixed sensing ranges with a different region.

Keywords: Genetic Algorithm, Haar Lifting Wavelet Transform, Node Connectivity, Optimal Sensor Placement, Target Coverage, Wireless Sensor Networks

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Application for Early Detection of Cardiac Diseases Based On Classification Algorithms

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Abstract

Over the last decade heart disease is the main reason for majority of the deaths in the world. Almost one person dies of heart disease about every minute in India alone. With the increasing number of deaths due to heart diseases, it has become mandatory to develop a system to predict heart diseases effectively and accurately. This study compares the accuracy score of Decision Tree, Logistic Regression, Random Forest, SVM, K-Neighbours and Perceptron algorithms for predicting heart disease using UCI machine learning repository dataset. The result of this study indicates that the Perceptron algorithm is the most efficient algorithm with accuracy score of 81.967% for prediction of heart disease. The existing data of heart disease patients from Cleveland database of UCI repository is used to make a test and clearance to the performance of decision tree algorithms. These datasets consist of 303 instances and 76 attributes. The dataset for this project is automatically taken from the raw value of the heart pulse sensor and it also used some manually given data. In the proposed work, we noticed that the raw data from the sensor actually increases the accuracy of the model. In the proposed work, we develop a web application based on the Perceptron algorithm using a larger dataset which helps the health professionals in predicting the heart disease effectively and efficiently.

Keywords: Machine Learning, AI algorithms, Heart Attack, Heart Disease, Cleveland Dataset, Smart monitoring system

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Review on Cardiac Arrhythmia Through Segmentation Approaches in Deep Learning

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Abstract:

Identifying the precise Heart Sounds (HS) positions inside a Phonocardiogram (PCG); otherwise, Heart Sounds Segmentation (HSS) is a vital phase for the automatic examination of recordings of HS, permitting for the categorization of pathological proceedings. Analysis of HS signals (explicitly, PCG) in the last some decades, particularly for automated HSS and also classification, was largely learned and also stated to encompass the possible value for detecting pathology precisely in medical applications since the bad outcomes in these stages will ruin or shatter the HS detection system's efficiency. Therefore, the PCG detection issues to implement a new efficient algorithm are required to be discussed. Here, the recently published pre-processing, segmentation, Feature Extractions (FE), and also classification techniques along with their top-notch of PCG signal examination were reviewed. Associated studies are contrasted with their datasets, FE, and the classifiers that they utilized. This effort aims to analyze all the research directions in PCG detection techniques. At the last of this appraisal, several directions for future research toward PCG signal analysis are rendered.

Keywords: Phonocardiogram (PCG) Cardiac auscultation Feature extraction Heart sound segmentation Classification

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A Secure Novel Cloud Framework for Personal Healthcare Records

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Abstract

The Personal Healthcare Record (PHR) allows the patients or other authorized persons to accomplish their own medical records in a centralized way, and it (PHR) appears as a patient-centric model which helps in the health information interchange. The PHRs can be deposited in the server maintained by the hospital/clinic or other trusted third-party including cloud providers. However, the data must be secure in the server. To provide security cryptographic service may be the solution. However, encryption and decryption of all the PHRs may degrade the processing performance of the system. So, we have proposed a novel framework that provisions the data in two domains. One is public domain and another is private. The PHRs in the private domain needs more security than the public domain. The data (PHRs) of the private domain is further classified according to their class of sensitivities and provided security according to the sensitivity levels. This leads to the enhancement of the processing performance of the system.

Keywords - PHR, security, suite, classification, sensitivity

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Deep Learning based Image Processing Approaches for Image Deblurring

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Abstract:

Mobile phone imagery has evolved substantially over the past two decades. The camera is one of the primary features of a new cell phone. A lot of research in this field has been done to enhance the quality of the image. A small phone structure limits the camera module mounted in cell phones, which means that there can be no mounted thick lenses or large image sensors on the phones. This affects the volume and the picture quality of the captured light. With less light, phones perform worse than digital Single-Lens Reflex (DSLR) cameras as opposed to image quality tests. Post processing is then used to enhance the quality of the image. Dark conditions and fast movement in mobile imaging are difficult. In dark conditions, longer exposure period collects more light, which can cause movement blurred objects. Motion blur artefact, e.g. when photo to graphing a racing car, and may also be caused by fast moving object at daylight. The movement blur causes sharp information to be lost and thus poor picture quality. A deblur ring is the tool used to eliminate flutter from photographs and make them appear clearer. In the field of signal processing deep learning-based approaches have recently become popular. The results have been promising since profound learning algorithms can learning and model nonlinear and complex connections. Deep learning algorithms were also used for several tasks in image restore work, as was done here.

Keywords: Deblur, Multi-blur, Motion blur, Image blurring, Image processing

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Sentiment Analysis for Segregation of Reviews Using Machine Learning Algorithm

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Astract

With the advent of the World Wide Web and its ease of access to the general public, people who used to be dependent on word of mouth to get an opinion or review of products are now turning to the web for the same. This project, as the title suggests, aims towards the Segregation of Positive and Negative Reviews that we come across in our day to day lives on internet and help the consumers derive a non-ambiguous idea about the product, using the concept of Sentiment Analysis in Machine Learning. In the modern world, with so many options and varieties around us in each and every domain and category, it seems to have become a tough call for us to make a choice, be it shopping from a particular brand or deciding on a restaurant to go to for a family lunch. However, Internet, on the other hand, is what makes these choices easier for us. Thousands and Lakhs of reviews that people leave on the internet today about a particular experience, serve as a deciding factor for other people to make a choice. These reviews can be directed directly towards the brand/experience or through a third party website/application, like Google and Zomato. The Model developed under this project will use the concept of Sentiment Analysis and help Segregate the reviews and distinguish between the Positive and the Negative ones, thereby assisting in an easier rating of the reviewed object and helping the viewer get an easier, summarized version of the reviews. The dataset has been created by collecting reviews of a restaurant which were obtained from Kaggle. Next, the data was pre-processed using Natural Language Processing (NLP) which was followed by Model Training using various concepts such as Bag of Words, CountVectorizer, Stopwords etc. The algorithm used is the Naïve Bayes algorithm. Finally, the model was tested to check the accuracy of Model.

KEYWORDS: Machine Learning**,** Segregation, Reviews, Sentiment Analysis, NaïveBayes.

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COLLEGE ENQUIRY CHATBOT

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Abstract :
With the digitalization of almost everything around us we are now able to find and access anything online. This has made life for humans far more convenient as they can now obtain any type of information or required products online through the various web application which are available on the internet. Large Companies have adapted to this change by creating their own webpages to help the users understand what the company is offering and how they can be benefited from these which was once quite hard to achieve. In the past this information would only be available by having to go to a local company branch to collect a brochure or meet a respective individual. However, with our digitalized era we can now obtain all of this information online through various different sources or web pages. Even though this has been able to help us obtain information in a much faster manner there are often cases upon which users struggle to find the data they may require and prefer getting in touch with a respective individual to have their doubts clarified. In our project we will work towards eliminating the need of human contact by establishing a form of artificial intelligence which can communicate with a human both ways in order to get the job done. This form of intelligence is known as a chatbot and we will be creating a College Web Application with this technology within its architecture. It will help users gain the information they require as well as clear any doubts which may not be found within our web application. Through this paper we will talk about how we have been able to develop our web application along with the various stages within the development.

Keywords: Chatbot, Web Technology

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Robustness Indices of 3R and 4R Planar Serial Manipulators with Fixed Actuation Scheme

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Abstract

The applications of automation and robotic manipulators are evidently increasing due to many advantages; this paper presents the planar serial manipulator performance analysis. There are many performance indices to explain the suitability and selection of manipulators, in this analysis, the Robustness index-I and Robustness index-II are considered for 4R and 3R manipulators. The 4R and 3R planar serial manipulator is taken in planar condition as the moment is restricted to a single plane. The 4R and 3R manipulators have all joints with revolute type in nature and the actuators are arranged at the fixed base joint; the manipulators are provided with base actuation which is fixed. The link lengths of the manipulator are varied in different ratios and the performance evaluation is conducted; these indices are calculated with the help of the Jacobian Matrix. Direct kinematic relations were used to generate the Jacobian Matrix.

Keywords: Performance measures, Serial manipulators, Robustness Index-I, II and Different kinematic link lengths

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An Efficient Recognition and Classification of Paddy Leaf Diseases Using Deep Learning and Metaheuristic Algorithm

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Abstract:
One of the most recent agricultural research topics is the recognition and classification of diseases from a plant leaf. With the exponential advancement of smart farming, plant disease detection becomes digitalized and data-driven, allowing advanced decision support, smart examination, and preparation. The detection of agricultural plant diseases using machine learning techniques would reduce the dependence on farmers to preserve agricultural goods. This paper proposes a deep learning-based metaheuristic algorithm of paddy leaf disease detection and recognition that enhances accuracy, generality, and training performance. This paper describes field images of various kinds of paddy leaf diseases: normal, bacterial blight, brown spot, and blast diseases. In this paper, the input image is assigned to pre-processing to remove noise and artifacts from the image. The pre-processed image is then used to classify paddy leaf diseases using the Optimized Deep Convolutional Neural Network with Cuckoo Search (DCNN-CS) Algorithm. Classification errors are reduced by optimizing weights and biases in the DCNN method using a cuckoo search algorithm (CS) during both generic pre-training and fine-tuning phases. This DCNN-CS technique allows the application of simple statistical optimization methods with a reduced computing workload, resulting in high classification accuracy. Finally, the proposed DCNN-CS model's classification accuracy and efficiency were evaluated and compared to other Classification Techniques.

Keywords: Paddy Leaf Diseases; Deep Convolutional Neural network (DCNN); Cuckoo Search(CS);Classification;Accuracy.

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Applications of Artificial Intelligence in Robot manipulators –Review

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Abstract

Our society is undergoing several technological changes. In just a couple of decades, it will be entirely different from what it is today. One important factor that affects and transforms various aspects of everyday life is the rapid growth of the artificial intelligence and robotics industry. Scientists, industry adepts and ordinary people all express multiple viewpoints about the potential outcomes of the constant Artificial Intelligence and robotics expansion. Artificial intelligence (AI) and robotics, collectively, is the enhancement and imitation of human pursuit and behavior to increase efficiency or output. Driven vastly by technological advancements and a rise in implementation and demand, these prospering fields have both gained a lot of attention in the past few years. However, their underlying sciences have been in development for years. What is most enthralling today is, the intersection of these two fields, where advancements in both AI and robotics depend on each other, erecting a multiplier effect on this intersection.

Keywords: Artificial Intelligence, Robotics, Technological Advancements, Scientists, Applications, Human Pursuit, Efficiency.

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A NOVEL ARCHITECTURE FOR FEATURE EXTRACTION AND PATHOLOGY DETECTION FROM CHEST X-RAY IMAGES

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Abstract:

Neural networks are widely used for the automation of analysis and classification tasks in the field of medical image processing. They have successfully achieved state of the art performance in medical image segmentation and feature extraction techniques. This automatic classification in the medical field is very helpful in developing tools for early detection of dreadful pathologies, like tuberculosis and pneumonia, in areas where access to doctors or radiologists is scarce. In this work, we proposed novel approach for the classification of lung pathologies like tuberculosis and pneumonia by masking them in boundary boxes using convolutional neural networks. Our solution provides a flexible way,by using saved trained models that could be directly employed by the Radiologists. In this paper, we describe the architecture required to achieve such a scalable model which could be used by doctors and radiologists without too much training in the technologies of the times. The proposed convolutional architecture consists of connected components which are parallel residual blocks and sampling layers. The images do not lose their original quality, giving the best error free predictions. We visualize this model to be deployed in labs, providing access to medical imaging expertise to some of the most remote places in the world.

Keywords: Pathology, Classification, Neural Network

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Water Evaporation Optimization Based PI Speed Controller for Direct Torque Control of Induction Motor

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Abstract

This paper presents the use of the modern heuristic optimization technique Water Evaporation Optimization (WEO) for tuning the PI speed controller in senseless Direct Torque Control(DTC) of induction motor. The optimization is designed to improve the speed response of the induction motor, subjected to step-change in reference speed. The performance of the WEO optimization is compared with conventional PI and particle swarm optimization (PSO) based optimized PI controllers. The PI controller is optimized with objective functions for minimization of Peak Overshoot, settling time of speed response subjected to step input. The comparative performance of the tuned PI Controller is analyzed using standard stability analysis using Integral time square error (ITSE) and Integral absolute error (IAE). The simulation model of sensorless DTC of induction motor is developed using Matlab/Simulink environment. The WEO and PSO algorithms are developed in Matlab editor to develop the optimized values of KP and KI of the Speed Controller of DTC.

Keywords: Direct Torque Control (DTC), Induction Motor, PI controller Optimization, particle swarm optimization (PSO) Water Evaporation Optimization (WEO).

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PREDICTION OF COST AND DEFECTS IN SOFTWARE DEVELOPMENT USING BAYESIAN THEOREM

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Abstract:

Software development is the process of initiating, organizing, executing, managing, and concluding a group's work in order to fulfil deadlines and achieve goals. For improved performance, machine-learning techniques are used in software development. Machine learning algorithms have shown to be quite useful in a wide range of applications. They are very helpful for (a) face's. (b) Domains with large datasets holding valuable implicit regularities to be identified; or c) domains where programmed must adapt to changing circumstances. Machine learning is a type of Artificial Intelligence (AI) that allows programming applications to be more precise in their expected outcomes. The goal of the project is to estimate the project's cost and faults. The Bayesian method is applied to the data set, and the output values are used to determine whether the project may be maintained or not.

Keywords: Artificial Intelligence (AI), Machine Learning.

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Real Time Smart Parking System Using Internet of Things (IoT)

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Abstract

Internet of Things (IoT) as referred to plays a vital role in the day-to-day routine of every individual. It is eminent in every aspect of human life. The paper gives an IoT based smart parking system as the latest technology, we also talk about the use of IoT for smart parking system. A smart parking system is the need of the hour as the idea of smart cities is on its boost. Utilizing the spaces, effective handling of traffic and exploiting resources in their best is what our paper focuses upon. In past years, works have been done on smart parking systems making it an even smarter system, where researchers have done and still working to create a system that is not technologically savvy but also user friendly. This paper proposes a design of IoT Based Smart Parking System where it helps the users to reserve and find parking slots using Android applications and Web Applications. This project is aimed to create a system that helps people with personal vehicles to find parking easily in selected areas. Both software and hardware platform have been developed in this system.

Keywords: IoT, Smart city, Smart systems, Mobile app.

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Familial Classification of Android Malware using Hybrid Analysis

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Abstract:
With the developments in mobile and wireless technology, mobile devices have become important part of our lives. While Android is the leading operating system in the market share, it is also the most targeted platform by attackers. While there have been many solutions proposed for detection of Android malware in the literature, the family classification of detected malicious applications becomes important, especially where the number of mobile malware variants increases every day in the market. In this study, a solution based on machine learning and hybrid analysis is proposed for the Android malware familial classification problem. An extensive feature set including network-related features and activity bigrams is proposed. The effective static and dynamic analysis features are studied thoroughly and evaluated on Malgenome [1], Drebin [2], and UpDroid [3] datasets.

Keywords: Android, mobile security, malware analysis and detection, malware family classification, machine learning, static/dynamic analysis, hybrid analysis

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Bernstein Multiplicity of Local Cohomology Modules

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Abstract

Let K be an algebraically closed field of characteristic zero and let $R = K[X_1,...,X_n]$. Let $A_n(K)$ be the n^{th} Weyl algebra over K and N be a left $A_n(K)$ module. The de Rham cohomology modules $H^*(\partial;N)$ are in general only K-vector spaces. As a result, due to Bernstein de Rham cohomology modules are finite-dimensional K vector spaces if N is holonomic. Let I be an ideal in R. Let $H_I^i(R)$ denote the local cohomology module of R for ideal I. As a result of Lyubeznik, the local cohomology modules $H_I^i(R)$ are holonomic $A_n(K)$-modules for each $i \geq 0$. In this paper, we compute the Bernstein multiplicity of $H_I^i(R)$ for certain classes of ideals I in R.

Keywords: local cohomology, associated primes, D-modules, Koszul homology, Bernstein multiplicity

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A Novel Method for routing packet between patient and doctor using sensor and cloud

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Abstract:
Hassle-free routing between two nodes without intermediate interference with better performance is a very challenging task. In the case of doctor and patient, it needs super speed to share several issues and remedial information with each other is projected as a routing algorithm with the sensor and cloud without any intermediate router by using IBM blue mix cloud. Direct contact with the destination router is possible by keeping an intelligent agent as a connector to the cloud and the sensors. A special header can be added behind the packet for the connection of several clouds or sensor-based destinations with priority. This technique can be used in the hospital for the establishment of a secure tunnel between patient and doctor.

Keywords: Cloud, Intelligent, Router, IBM bluemix, Agent, Sensor

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Growth of Hilbert coefficients of Syzygy modules

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Abstract

Let $(A,\mathfrak{m})$ be a local complete intersection ring of dimension d and let I *will* be an $\mathfrak{m}$ primary ideal. Let M be a maximal Cohen-Macaulay A–module. For $i = 0,1,2,3,\cdots,d$ let $e^I_i(M)$ denote the i^{th} Hilbert-coefficient of M with respect to I. A result due to Tony, the function $j \mapsto e^I_i(Syz^A_j(M))$ is of quasi-polynomial type with period 2, for $i = 0,1,2$. Let $G_I(M)$ be the associated graded module of M with respect to I. If $G_I(A)$ is Cohen-Macaulay and $dim(A) \leq 2$ he also proved that the function $j \mapsto depth G_I(Syz^A_{2j+i}(M))$ are eventually constants for $i = 0,1$. As the Syzygy modules over a complete intersection ring possess many nice properties. This motivates us to further investigate the nature of Hilbert coefficients Syzygy modules.

Keywords: Hilbert function, Hilbert-coefficients, Syzygy Modules, Complete intersection rings.

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Paddy Leaf Disease Detection using CNN

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Abstract:

Plant diseases function as a significant threat to the food industry. The projected system helps in detection of crop diseases and provides remedies which might defend in contradiction of the crop infection. The information from the web is divided and also the totally different plant types are known and are relabeled so that we can create accurate information then get a sample database which consists of various crop diseases which will help in identifying the accuracy levels of the application. So by a training dataset we will train our classifier so the production will be predicted with best truthfulness. We tend to practice the CNN that includes various layers that are used for prediction.

Keywords: ***Convolutional Neural Network, Matlab Software, Image Processing technique, Paddy leafdiseasedetection,Featureextraction***

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Detecting Fake Accounts on Social Media Using Recurrent Neural Networks

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Abstract

In the present generation, On-Line social networks (OSNs) have become increasingly popular, which impacts people's social lives and impel them to become associated with various social media sites. Social Networks are the essential platforms through which many activities such as promotion, communications, agenda creation, advertisements, and news creation have started to be done. Adding new friends and keeping in contact with them and their updates has become easier. Researchers have been studying these online social networks to see the impact they make on people. Some malicious accounts are used for purposes such as misinformation and agenda creation. Detection of malicious accounts is significant. The methods based on machine learning were used to detect fake accounts that could mislead people. The dataset is pre-processed using various python libraries and a comparison model is obtained to get a feasible algorithm suitable for the given dataset. An attempt to detect fake accounts on social media platforms is determined by various Machine Learning algorithms. The classification performances of the algorithms Random Forest, Neural Network and Support Vector Machines are used for the detection of fake accounts.

Keywords: Security, Privacy, Machine learning, Fake Account, Activity Analysis, Neural Networks, social media

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A Comparative Study on Efficient Cloud Security, Services, Simulators, Load Balancing, Resource Scheduling and Storage Mechanisms

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Abstract:
There are applications in software that can process the user or customer records in hospitals, education sector, government sector, social media and mail communication, etc., which require accessing a single or set of records in a database consisting of millions of records. A basic requirement of those applications is that, the need to access a few data required in a secured manner from the data sets which are very large but simple in structure. Cloud computing provides the computing requirements for these kinds of the new generation of applications involving very large data sets that cannot possibly be handled efficiently without understanding the available cloud computing infrastructures. The objective is to find the cloud security, services, simulators, load balancing, resource scheduling and storage mechanisms which can best suite the need of the cloud environment chosen in an efficient way. This survey would act as a catalyst for the design of cloud environment over the very large data set in the future.

Keywords: Cloud Security, Cloud Services, Load Distribution, Resource Scheduling, Storage Mechanism, Cloud Simulators, Cloud Computing Environment.

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Detecting Phishing Websites Using Deep Learning

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Abstract

Phishing attacks target vulnerabilities that exist in systems due to the human factor. Many cyberattacks are spread via mechanisms that exploit weaknesses found in end-users, which makes users the weakest element in the security chain. The phishing problem is broad and no single silver-bullet solution exists to mitigate all the vulnerabilities effectively, thus multiple techniques. Detection of Phishing websites is an intelligent and effective model that is based on using classification or association Data Mining algorithms. These algorithms were used to identify and characterize all rules and factors to classify the phishing website and the relationship that correlate them with each other so we detect them by their performance accuracy, several rules generated and speed. The proposed system implements both algorithms which are Classification that optimizes the system which is more efficient and faster than the existing system. Phishing is one of the most common and most dangerous attacks among cyber-crimes. These attacks aim to steal the information used by individuals and organizations to conduct transactions. Phishing websites contain various hints among their contents and web browser-based information. The purpose of this study is to perform Extreme Learning Machine (ELM) based classification for 40 features including Phishing Websites Data in the UC Irvine Machine Learning Repository database.

Keywords: Random forest, Artificial Neural Network(ANN), URL, browser extension, machine learning, phishing websites, phishing features

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Recognition of Novel Attacks using Fuzzy if-then Association

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Abstract:

Intrusion detection systems today are relatively capable of detecting network intrusions by attackers. Unfortunately, these systems operate on a network level and not on a system level. Meanwhile, antivirus software is typically capable of detecting known viruses but cannot easily stop zero day exploits. The paper will propose a fuzzy inference system to detect exploitation of a system using system metrics such as CPU, memory usage and network connections. This system is implemented using the MATLAB fuzzy logic toolbox. The design was tested and provided reasonable results. The proposed algorithm is implemented using SNORT IDS tool by taking input from DARPA 1998 and KDD Cup'99 data set and produced promising results as compared with traditional network IDS systems.

Keywords: Intrusion detection system, Fuzzy exploit monitor, Fuzzy inference system, Computer security, Zero day exploits, fuzzy reasoning, fuzzy if-then rule.

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An experimental Study on Optimal Semi-Partitioned Scheduling in SRT Systems

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Abstract

Semi-partitioned real-time scheduling algorithms extend partitioned ones by allowing a (usually small) subset of tasks to migrate. The first such algorithm to be proposed was directed at soft real-time (SRT) sporadic task systems where bounded deadline tardiness is acceptable. That algorithm, called EDF-fm, has the desirable property that migrations are boundary-limited, i.e., they can only occur at job boundaries. However, it is not optimal because per-task utilization restrictions are required. In this work, a new optimal semi-partitioned scheduling algorithm for SRT sporadic task systems is proposed that eliminates such restrictions. This algorithm, called EDF-os, preserves the boundary-limited property. In overhead-aware schedulability experiments presented herein, EDF-os proved to be better than all other tested alternatives in terms of schedulability in almost all considered scenarios. It also proved capable of ensuring very low tardiness bounds, which were near zero in most considered scenarios.

Keywords: Semi-Partitioned, Soft Real-Time, Real-Time Scheduling, EDF

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Phishing email detection based on Machine learning algorithm

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Abstract:
In the world of cybersecurity, phishing has emerged as a severethreat. Cybercriminals utilize email as one of their key connection techniquesto entice potential victims. The proposed approach takes into account fourdistinct features: the email title, email body, hyperlinks, and contentreadability. A total of 41 attributes were picked from the four dimensionslisted above. According to the findings, the proposed approach was 95.56percent accurate. The most crucial finding of the experiment is thatattackers continue to exploit similar features to assault their victims.

Keywords: Phishing·Cyber-crime·SocialEngineering·Machine Learning

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Real-Time Operating System Support for Multicore Applications: A Survey

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Abstract

Modern multicore platforms feature multiple levels of cache memory placed between the processor and main memory to hide the latency of ordinary memory systems. The primary goal of this cache hierarchy is to improve average execution time (at the cost of predictability). The uncontrolled use of the cache hierarchy by real-time tasks may impact the estimation of their worst-case execution times (WCET), especially when real-time tasks access a shared cache level, causing contention for shared cache lines and increasing the application execution time. This contention in the shared cache may lead to deadline losses, which is intolerable particularly for hard real-time (HRT) systems. Shared cache partitioning is a well-known technique used in multicore real-time systems to isolate task workloads and to improve system predictability. Presently, the state-of-the-art studies that evaluate shared cache partitioning on multicore processors lack two key issues. First, the cache partitioning mechanism is typically implemented either in a simulated environment or in a general-purpose OS (GPOS), and so the impact of kernel activities, such as interrupt handlers and context switching, on the task partitions tend to be overlooked. Second, the evaluation is typically restricted to either a global or partitioned scheduler, thereby failing to compare the performance of cache partitioning when tasks are scheduled by different schedulers. Furthermore, recent works have confirmed that OS implementation aspects, such as the choice of scheduling data structures and interrupt handling mechanisms, impact real-time schedulability as much as scheduling theoretic aspects. However, these studies also used real-time patches applied into GPOSes, which affects the run-time overhead observed in these works and consequently the schedulability of real-time tasks. Additionally, current multicore scheduling algorithms do not consider scenarios where real-time tasks access the same cache lines due to true or false sharing, which also impacts the WCET. This work addresses these aforementioned problems with cache partitioning techniques and multicore real-time scheduling algorithms. The results show that by simply assigning tasks that shared cache partitions to the same processor, it is possible to reduce the contention for shared cache lines and to provide HRT guarantees. Finally, a two-phase multicore scheduler that provides HRT and soft real-time (SRT) guarantees is proposed. It is shown that by using information from hardware performance counters at run-time, the RTOS can detect when best-effort tasks interfere with real-time tasks in the shared cache. Then, the RTOS can prevent best effort tasks from interfering with real-time tasks. The results also show that the assignment of exclusive partitions to HRT tasks together with the two-phase multicore scheduler provides HRT and SRT guarantees, even when best-effort tasks share partitions with real-time tasks.

Keywords: Real-time operating systems, multicore real-time scheduling, task partitioning, shared cache memory partitioning.

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An Overview of

Research Opportunities in Fog and IoT

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Abstract:
Fog is an emergent architecture for computing, storage, control, and networking that distributes these services closer to end users along the cloud-to-things continuum. After cloud computing, fog computing has become the latest buzzword in the computing world. This new computing paradigm could be viewed as a cloud computing extension. The primary goal of fog computing is to lessen the stress on the cloud by bringing workloads, services, applications, and large amounts of data closer to the network edge. The Internet of Things (IoT) is causing a digital transformation in our personal and professional life. Data is being generated at an exponential rate as the number of connected devices grows. High-speed data processing, analytics, and quicker response times are becoming more important than ever as the Internet of Things expands into the Internet of Everything and stretches its reach into practically every area. Meeting these requirements is difficult with the present centralised, cloud-based system. However, fog computing, a decentralised architectural pattern that moves computing resources and application services closer to the edge, can make this possible. Fog computing is required to bring the benefits and power of cloud computing closer to where data is generated. Fog computing minimises the amount of data sent to the cloud for analysis and processing.

Keywords: Internet of Things, fog computing, research opportunities, cloud.

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An Intelligent COVID-19 Classification Model Using Optimal Grey-Level Co-Occurrence Matrix Features with an Extreme Learning Machine to Investigate the Diagnostic Value and Consistency of Chest CT

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Abstract

An outbreak of coronavirus disease 2019 (COVID-19) infection began in December 2019 in Wuhan, the capital of central China's Hubei province. Although the virus likely has a zoonotic origin related to the city's Huanan Seafood Market, widespread human to-human transmission has resulted in 73 451 cases in 26 countries, with 1875 deaths as of February 18, 2020. The disease was first reported in the United States on January 20, 2020, and the total number of cases in the United States has reached 15 as of February 17, 2020. The most common clinical symptoms at presentation are fever and cough in addition to other nonspecific symptoms including dyspnea, headache, muscle soreness, and fatigue. About 20% of cases are severe, and mortality is approximately 3%. The World Health Organization declared a global health emergency on January 30, 2020. In this retrospective study, chest CT scans from 121 symptomatic patients infected with coronavirus disease 2019 (COVID-19) from four centers in China from January 18, 2020, to February 2, 2020, were reviewed for common CT findings in relation to the time between symptom onset and the initial CT scan (ie, early, 0–2 days [36 patients]; intermediate, 3–5 days [33 patients]; late, 6–12 days [25 patients]). The hallmarks of COVID-19 infection on images were bilateral and peripheral ground-glass and consolidative pulmonary opacities. Notably, 20 of the 36 patients (56%) imaged in the early phase had a normal CT scan. With a longer time after the onset of symptoms, CT findings were more frequent, including consolidation, bilateral and peripheral disease, greater total lung involvement, linear opacities, crazy-paving pattern, and the reverse halo sign. Bilateral lung involvement was observed in 10 of the 36 early patients (28%), 25 of the 33 intermediate patients (76%), and 22 of the 25 late patients (88%).

Keywords: COVID-19; disease diagnosis; feature extraction; classification; deep learning.

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Role of Internet of Things in Urban Sustainability

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Abstract:
The Internet of Things (IoT) is one of the foundational technologies of the Smart City idea, and it has the potential to play a significant role in promoting urban sustainability. We analyse the interaction between three main concepts in this study: Smart Cities, IoT, and Sustainability, in order to highlight the barriers and opportunities that exist in the Smart Cities context for the synergistic use of IoT for sustainability. In this paper, we also discuss some of the current use cases for the IoT in urban sustainable development, as well as the future vision for these applications as they change and adapt in the real world. As many applications are interdisciplinary, a full understanding of the difficulties that accompany them is essential. The study of difficulties and potential in this area will help to improve collaboration between diverse sectors of urban planning and the use of IoT for sustainability.

Keywords: IoT, Smart Cities, Sustainability

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Hybrid Genetic Algorithm and Machine Learning Framework for COVID-19 Detection from Cough Signals

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Abstract: With many successful applications, Artificial Intelligence (AI) has been seen in our everyday lives in a variety of ways. Nowadays with the COVID-19 outbreak and due to the extreme economic and health effects of this disease, many scholars try to utilize Machine Learning (ML) techniques to control the spread of the disease using various scenarios. AI has proven effective and powerful in combating the spread of the disease. The preliminary diagnosis of the COVID-19 from the cough sound is one of the successful scenarios of employing ML techniques in fighting the disease. With the help of ML, the COVID-19 diseases can be diagnosed by performing a differential analysis for the sound of the cough of an infected person and comparing it to a cough of non-COVID-19. Therefore, this paper proposes a hybrid framework for efficiently COVID19 detection and diagnosis using various ML algorithms from cough audio signals. The accuracy of this framework is improved with the utilization of the Genetic algorithm with the ML techniques. We also assess our system for diagnosis on metrics such as precision, recall, F-measure. The results proved that the hybrid (GA-ML) technique provides superior results based on different evaluation metrics as compared with different ML approaches. The proposed framework will efficiently help the physicians in providing a proper medical decision regarding the COVID-19 analysis thereby saving more lives.

Keywords: COVID-19, AI, GA-ML technique, Cough audio signals, Classification.

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Secure Digitization of Land Record using Blockchain Technology in India

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Abstract:
The traditional way of selling and buying land has lots of problems exists as its takes time, the verification process is lengthy and final processing is also time-consuming. With the development of Information and Communication Technologies (ICTs), the records are converted from file to digital. Still, there are several challenges are there to make the land management system effective and trustworthy. During the buying or selling process, different middlemen exist at various levels which makes the process complex and risky. There is a chance of duplication or forge of digital documents by the fraudulent person. To eliminate the above challenges in this paper Blockchain-based approach is applied to make the land record management system secure. The paper initially described the overall challenges that exist in the land record system in the India scenario. The authors in this paper proposed a Secure distributed architecture for land record management. Ethereum platform is used for the implementation of the land record digitization. The results analysis show that the system becomes faster, transparent, records are immutable by the use of Blockchain technology.

Keywords: Land record digitization; Blockchain; Secure Storage; Ethereum, Security.

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An Adaptive Flying Sparrow Search Algorithm

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Abstract

Currently, intelligent optimization algorithms are favoured by researchers. The sparrow search algorithm has better-searching ability than other algorithms, but it still has the drawbacks of trapping into local extremes and relying on population initialization. To compensate for these shortcomings, we present an adaptive flight sparrow search algorithm (ALSSA). First, the tent mapping based on random variables is used to initialize the population, which makes the individual position distribution more uniform, enlarges the workspace, and improves the diversity of the population. Then, in the discoverer stage, the adaptive weight strategy is integrated with the Levy flight mechanism, and the fusion search method becomes extensive and flexible. Finally, in the follower stage, a variable spiral search strategy is used to make the search scope of the algorithm more detailed, which improves the convergence accuracy of the algorithm. The improved algorithm ALSSA is verified by 18 standard test functions and the Wilcoxon rank-sum test. At the same time, ALSSA is applied to robot path planning. The feasibility and practicability of ALSSA are verified by comparing the algorithms in the two models' raster map planning routes. Although ALSSA can make up for some of the deficiencies of the optimization algorithm, it still has some shortcomings and needs further study in the future.

Keywords: Sparrow search algorithm; Random variable; tent mapping; Adaptive weights; Levy flight; Robot path planning

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A Comprehensive Survey Analysis in Image Fusion using masking for Future Directions

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Abstract:
In image processing fusion having a significant importance for different applications. Generally the process of image fusion is applied in multiple image and get output is one image. Now a day's fusion is most popular in machine perception so we need accurate images after applying the fusion techniques. So in this work we compared different fusion techniques and analyzed their performance. Here different masks are applied in the images using discrete cosine transform (DCT) for better results. Out of different masking's fanshaped mask gives better quality fused images. In this paper study the different image processing fusion techniques and compare those fusion techniques given a comparative result. The results help full to the researcher which fusion techniques is better suitable for their work.

Keywords: fusion, dct, masking

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An Extensive Survey on Bankruptcy Dataset

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Abstract

Prediction of bankruptcy is an active area for research that is associated with the state of insolvency where a company or a person is unable to repay the creditors the debt amount. Up to now, so many statistical and machine learning-based models have been introduced for bankruptcy prediction. The pre-processing phase is an important step to enhancing the performance of the model. Thus, one needs to choose effective pre-processing techniques which can be more suitable for the data set considered. However, this paper focused on both the model, specifically, ensemble models for classification to address how new improved models are developed by combining two or more simple developed techniques and pre-processing techniques to address the imbalanced nature of the data and outlier if any present in the data. In most of the papers, the authors make some comparisons to show up the performance of their models with some other previously developed models. Here, from the survey, the paper concludes that the pre-processed datasets give better prediction outcomes and it also proved that the ensemble models are more powerful for bankruptcy prediction as compared to the single models.

Keywords: Prediction, Bankruptcy, Pre-processing

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SMART SEWAGE SYSTEM

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Abstract:
This project is focused on a live sewage level detection device that sends an alert to a remote observer, and it aims to provide smart solutions for tracking poisonous sewagegases.The hardware is designed such that it shall send a prior alert to the sewage workerto ensure them safety, Sewage environment IoT device and IoT platform to monitorpoisonous gas has been proposed as a solution to help the sewer workers who puttheir lives in jeopardy and ensureminimal health risk. Because of these poisonousgases,the death rate of sewer workers has increased in recent years. The lack of treatment of sewage after crossing dangerous levelsleads to the deaths of thousands of sewagecleaners throughoutthe yearfrom accidents andvariousdiseases such as hepatitis and typhoid that occur due to sudden or sustained exposure to hazardous gases, Sewage gases generally arise from the natural decomposition of sewageand their mixtures formedby slurrieswhich leads to theproduction of toxic wastes t hatrelease hazardous gases.If inhaled in high amounts or foran extended period, these gasesm ay be fatal. Several dangerous incidents have occurred in recent decades because of the lack of adequate gas leak detection systems. Cleaning of drains People is unaware of the dangers of a sudden attack of toxic gas because the fumes are odorless and can cause severe health issues if exposed for an extended period. To address all these issues,an effective drainage channels monitoring system is needed.

Keywords—Sewage detection, IoT, Telegram, Gas Sensors, Arduino IDE, Python

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Distributed Ledger Technology in the Construction Industry using Corda

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Abstract

The population of the entire world has been increasing steadily over the past decades. One of the most basic requirements for the survival of humans is a shelter that could be anything from a small hut to a luxurious skyscraper, ultimately giving the construction industry a major role in this process. In comparison to many other industries, the construction industry can be termed as one of the world's most fragmented sectors due to the scattered and complex supply chain. Furthermore, this complexity moves a step higher while keeping track of the various factors involved, like the clients, architects, contractors, material suppliers, etc. Also, the complex supply chain of the globally manufactured construction products has to be managed for the sake of meeting quality requirements and customer satisfaction. But the lack of accountability in the construction industry sometimes leads to various types of faults, delays, and even accidents at some stages. Keeping these main points in mind, this chapter introduces a key to this dispute with the help of Corda, a distributed ledger platform for permissioned networks, inspired by blockchain technology. This helps in maintaining transparency amongst the stakeholders involved in this industry, thus preventing any form of miscommunication.

Keywords: Construction Industry, Supply Chain, Corda, Distributed Ledger, Blockchain

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Detection From Text using LSTM

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Abstract:

Emotion can be expressed in several forms, which can be facial expressions, voice and text. This paper implements a methodology based on the LSTM (long-short-term memory) theory that includes principles to identify the text emotions from NLP (Natural Language Processing) domain. It proposes an approach based on LSTM which is defined to identify feelings in text using pre-trained words from Glove Word Embeddings.It is also necessary to take into account the personality of the user, such as when creating device models, in order to make the experience more unique. Protection and privacy are what brings our model a solid life, and this is where federated learning comes in. Not only does federated learning allow us to train the model at the user end or at the neutral end, it also serves as a framework for managing the aggregation of data from multiple teaching devices. This concept of emotion detection from text can be useful and productive for modern day keyboard prediction and emoji prediction on the fly by being able to train on distributed text data (imitating the concept of having and deploying trained models or description from teachers in this case devices such as smart phone and computers).

Keywords: NLP, LSTM, Glove, Word Embeddings, PyTorch

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A Design Model of Copyright Protection System Based on Distributed Ledger Technology

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Abstract

Nowadays, copyright protection systems are centralized. However, a centralized copyright system is typically tedious and expensive to maintain and does not provide adequate features to the users. Here, we aimed to eliminate copyright infringement, in which all created work of the creators is continuously recorded in a distributed ledger and with the association of smart contracts, ownership transfer and licensing of the created work for user can be carried out effortlessly through association with smart contracts. We developed a model based on blockchain technology that ensures to extract the features provenance for tracing of ownership transfer histories which in turn ensures system transparency and traceability. The copyright system model implementation and design are performed using smart contracts, Web3.js library, and JavaScript. Furthermore, the system is tested on both a local network, the Truffle suite, and the Kovan test network. This paper covers in detail blockchain, the existing copyright system and how blockchain can be implemented in this system effectively. A solution model is designed for the system along with an explanation of the procedure to build the system.

Keywords: Blockchain, Smart Contracts, Transparency, Traceability, Decentralized

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An Internet Of Things For Data Security In Cloud Using Artificial Intelligence

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Abstract:

Cloud computing (CC) offers online access to Network Services, in specific data collection and processing capability, with advanced, transparent user management.CC has become a more and more private and public data centerset that provides the user with a share Internet portal. A wide variety of smart devices can form an IoT network to collect and transmit massive data. Separate networks such as data collection, storage, and the handling of large data generate many analysis problems. The huge amount of resources present in the Cloud can be of great advantage to IoT, meanwhile, the cloud can acquire more attention to dynamize and transfer its restrictions with real artifacts . AI technologies are resource challenges that need careful adjustment to fit into a significant proportion of computing resources, especially integrated systems. Recently the Internet of Things (IoT) model has developed into an intelligent building environment application. In every smart IoT setting in the actual world, security and privacy are considered core concerns. IoT-based networks have security issues that generate security risks for smart environments. The strong learning capabilities of AI make the machine more reliable and efficient in identifying malicious attacks. This paper presents a modern architecture that will endorse many instances of IoT-enabled AI smart home use with a specific analysis of security risks, problems, and solutions using the LR algorithm.

Keywords: IoT, Artificial Intelligence, Internet of Things (IoT), Security,Cloud, LR algorithm

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Hand Hygiene Monitoring and Compliance System Using Convolution Neural Networks

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Abstract

Hand hygiene monitoring and compliance systems play a significant role in curbing the spread of healthcare-associated infections and the COVID-19 virus. In this paper, a model has been developed using convolution neural networks (CNN) and computer vision to detect an individual's germ level, monitor their hand wash technique, and create a database containing all records. The proposed model ensures all individuals entering a public place prevent the spread of healthcare-associated infections (HCAI). In our model, the individual's identity is verified using two-factor authentication, followed by checking the hand germ level. Furthermore, if required the model will request sanitizing/ hand wash for completion of the process. During this time, the hand movements are checked to ensure each hand wash step is completed according to World Health Organization (WHO) guidelines. Upon completion of the process, a database with details of the individual's germ level is created. The advantage of our model is that it can be implemented in every public place and it is easily integrable. The performance of each segment of the model has been tested on real-time images.

Keywords: Convolution neural networks (CNN), Template matching, Optical character recognition (OCR), Frame extraction, Image processing, Hand hygiene.

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Hybridizing artificial intelligence algorithms for sediment yield forecasting with single- and multi-objective optimization

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Abstract:

Rivers play major roles within ecosystems and society, including domestic use, industry, agriculture, and power generation. However, due to the detrimental effects of sediment yield in Rivers, understanding the sediment load behavior has drawn considerable attention over recent decades. The forecasting of sediment yield is important in design, management, planning, and preventing natural disasters of river systems. It is always challenging to forecast sediment yield using conventional methods because they cannot handle complex nonlinearity and non-stationarity.Artificial intelligence (AI) techniques have become popular in water resources engineering for solving complex problems such as sediment transport modeling, which is directed by numerous controlling factors. In this study, major key factors, namely relief, rock type, rainfall, temperature, water discharge, catchment area, and suspended sediment yield (SSY), were considered for developing the forecasting model of SSY in the Mahanadi River, one of the largest Rivers in India**.** This study aims to develop single-objective and multi-objective genetic algorithm-based artificial neural network models to forecast the SSY at eleven gauge stationsusing 20 years of data in the Mahanadi River basin. The multi-objective model was used to optimize the two conflicting objective functions, i.e., mean error (bias) and error variance. On the other hand, the mean square error (MSE) objective function is considered for the single-objective optimization model. The developed models' accuracy is examined by the root mean square error (RMSE) and correlation coefficient (r) statistical measures on the testing data set.

Keywords: Artificial neural network; Genetic algorithm; Sediment yield; Mahanadi River.

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Smart Dustbin using Arduino

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Abstract

The main objective of the project is to design a smart dustbin that will help in keeping our current environment clean and also eco-friendly. We are inspired by the Swachh Bharat Mission. These days' technologies are getting smarter day by day thus, as to clean the environment. The paper presents the design of a smart dustbin by using Arduino. This smart dustbin management system depends on the microcontroller setup structure having ultrasonic sensors concerning the dustbin. In case the dustbin is not kept up then this can cause an unhealthy environment and can cause pollution that impacts our prosperity. In this proposed innovation we have planned a keen dustbin utilizing ARDUINO UNO, alongside ultrasonic sensor, servo engine, and battery jumper wire. After all hardware and programming affiliation, as of now, the Smart Dustbin program will be run. Dustbin lid will open when someone comes near at some range then wait for the user to put the garbage and close it. It's properly running or not. For society, it will help toward health and cleanliness, for business we try to make it as cheap as possible. So that normal people and rich people can benefit from it.

Keywords: Arduino, microcontroller, IOT, circuitry