



Secured Ant Colony Optimization based on Energy Trust System for Replica Node Attack Detection

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ABSTRACT: Construction of cloud computing and promotion of applications such as social network service and smart city have driven the need for trust mechanism with the rapid developments of Internet of things (IoT). In the existing methods, storing the trust value incurs high storage overhead leading to energy inefficiency and reliability of identifying trustful or untrustworthy node is very less. In order to avoid these drawbacks, Secured Ant Colony Optimization (SACOP) based on trust sensing model is proposed to detect the node replication attack. Firstly, node's trust value is estimated using direct and indirect trust evaluation model to identify the malicious node in the clustered network. Secondly, ant colony routing algorithm is introduced to select the secured optimal path using probability to select the next hop node for data forwarding. As the probability is calculated using the residual energy, trust and pheromone values, energy expenditure among all nodes gets balanced. The proposed algorithm performs better in terms of packet loss rate, time delay, throughput and average energy consumption compared to existing scheme DDR.

Keywords: Ant colony Optimization, Pheromone, Probability, Replication attack, Trust.

Abbreviations: IoT, Internet of Things; WSN, Wireless Sensor Networks; SACOP, Secured Ant Colony Optimization; CM, Cluster Member; CH, Cluster Head; BS, Base Station; ID, Identity.

I. INTRODUCTION

In aspects of diagnosis, monitoring and surveillance, smart city offers wide applications for urban residents. Physical information around the environment is collected using ubiquitous sensor nodes [1]. Sensor nodes make use of distributed facilities to operate in unattended environment. Although WSNs is an open and distributed system, it is vulnerable to attacks due to its simplicity and resource-restraint in the design of hardware unit [2]. Moreover, the attack is more probable because of the wireless communication channel. The conventional protocol design available in the existing work is inappropriate due to its complexity for resource-limited WSNs [3]. The security aspects such as authentication, encryption, verification of information integrity and intrusion detection are widely applied in many researches in wireless sensor network.

There are many attacks that penetrate inside the network and destroy the normal operation of the node while most of the security mechanisms deal with attacks from the perimeter of the network [4]. Selfish node, malicious forwarding, black hole, rushing or worm attacks are few examples of insider attacks [5, 6]. A popular and effective method is the trust model-based management mechanism [7]. In respect of solving internal attacks and identifying malicious nodes trust evaluation model demonstrates a significant advantage since it involves low computation and communication

load [8]. Most of the existing work concentrates on either energy utilization or attack node detection. Only few papers deals with the optimized result of both energy efficiency and attack node detection. But that too have more false alarm rate in detecting attack nodes. So the objective of the proposed work is to reduce false alarm rate with reduced energy consumption. An attack in which many replica nodes are created from a single original node in the network is known as replica node attack. Nodes are captured and re-programmed by the adversary and the region which holds such nodes is known as replica node region. The contributions made in this paper are:

- reduced packet loss rate
- reduced time delay
- improved throughput
- reduced average energy consumption

The rest of the sections in this paper are organized as follows: Section II discusses the existing work. System design and various phases of the proposed method are described in Section III. In Section IV, the simulation results are given with the performance evaluation. Finally, conclusion is given in Section V.

II. RELATED WORK

Credible trust management scheme is proposed based on Bayesian theory for WSNs [9]. Initially, RFSN model is used to find trust value estimate and comprehensive

Article

A Heuristic Angular Clustering Framework for Secured Statistical Data Aggregation in Sensor Networks

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Abstract: Clustering in wireless sensor networks plays a vital role in solving energy and scalability issues. Although multiple deployment structures and cluster shapes have been implemented, they sometimes fail to produce the expected outcomes owing to different geographical area shapes. This paper proposes a clustering algorithm with a complex deployment structure called radial-shaped clustering (RSC). The deployment structure is divided into multiple virtual concentric rings, and each ring is further divided into sectors called clusters. The node closest to the midpoint of each sector is selected as the cluster head. Each sector's data are aggregated and forwarded to the sink node through angular inclination routing. We experimented and compared the proposed RSC performance against that of the existing fan-shaped clustering algorithm. Experimental results reveal that RSC outperforms the existing algorithm in scalability and network lifetime for large-scale sensor deployments.

Keywords: clustering; radial-shaped clustering; node deployment; energy efficiency; routing; sensor networks

1. Introduction

In most applications, sensors are used on a large scale to improve reliability and efficiency. A wireless sensor network (WSN) comprises a large number of sensor nodes with sensing and communication capabilities. The sensor nodes jointly collect and transmit data to the coordinator node, referred to as the sink node [1]. The main objective of deploying sensor nodes is to monitor the surrounding phenomenon, then process and transfer information to an analysis center. Sensor nodes are static, mobile devices commonly powered by limited power sources like batteries [2–6]. Sensor nodes have a limited transmission range. Consequently, optimal power utilization and the transmission of data over long distances is essential in a network of sensor nodes.

In a network of sensor nodes, clustering techniques are used for data collection, where sensor nodes are grouped into clusters for the conservation of energy [7]. Each cluster consists of nodes called members and a frequent reporting point called the cluster head (CH). Each node senses data and transmits them to their corresponding CH. Subsequently, the CH aggregates the collected data,



An Intelligent Web Caching System for Improving the Performance of a Web-Based Information Retrieval System ☒

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Abstract

With an increasing number of web users, the data traffic generated by these users generates tremendous network traffic which takes a long time to connect with the web server. The main reason is, the distance between the client making requests and the servers responding to those requests. The use of the CDN (content delivery network) is one of the strategies for minimizing latency. But, it incurs additional cost. Alternatively, web caching and preloading are the most viable approaches to this issue. It is therefore decided to introduce a novel web caching strategy called optimized popularity-aware modified least frequently used (PMLFU) policy for information retrieval based on users' past access history and their trends analysis. It helps to enhance the proxy-driven web caching system by analyzing user access requests and caching the most popular web pages driven on their preferences. Experimental results show that the proposed systems can significantly reduce the user delay in accessing the web page. The performance of the proposed system is measured using IRCACHE data sets in real time.

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ORIGINAL ARTICLE

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Computationally efficient and secure anonymous authentication scheme for IoT-based mobile pay-TV systems

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Abstract

In the next few years, the mobile pay-TV systems will be very popular due to their extensive applications. Providing security and privacy are the most challenging issues in the secure development of mobile pay-TV systems. To avoid unauthorized access to mobile pay-TV services, it is very important to authenticate the mobile users and the head end system (HES) in an anonymous manner. Even though several authentication schemes were proposed to provide anonymous authentication, the previously proposed schemes are not fit for mobile pay-TV applications due to their high computational complexity. Hence, a computationally efficient anonymous authentication scheme is proposed in this article for secure service provision in mobile pay-TV systems. The proposed authentication scheme can effectively authenticate both the mobile users and the HES with low computational cost in an anonymous manner. In addition, an anonymous batch authentication scheme is also proposed in this article to authenticate a batch of users in the subscription phase to alleviate the authentication burden of the HES. The security analysis section shows that the proposed scheme is more efficient in terms of security and the performance analysis section shows the strength

A Novel Forgery Detection in Image Frames of the Videos Using Enhanced Convolutional Neural Network in Face Images

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Abstract: Different devices in the recent era generated a vast amount of digital video. Generally, it has been seen in recent years that people are forging the video to use it as proof of evidence in the court of justice. Many kinds of researches on forensic detection have been presented, and it provides less accuracy. This paper proposed a novel forgery detection technique in image frames of the videos using enhanced Convolutional Neural Network (CNN). In the initial stage, the input video is taken as of the dataset and then converts the videos into image frames. Next, perform pre-sampling using the Adaptive Rood Pattern Search (ARPS) algorithm intended for reducing the useless frames. In the next stage, perform pre-processing for enhancing the image frames. Then, face detection is done as of the image utilizing the Viola–Jones algorithm. Finally, the improved Crow Search Algorithm (ICSA) has been used to select the extorted features and inputted to the Enhanced Convolutional Neural Network (ECNN) classifier for detecting the forged image frames. The experimental outcome of the proposed system has achieved 97.21% accuracy compared to other existing methods.

Keywords: Adaptive Rood Pattern Search (ARPS); Improved Crow Search Algorithm (ICSA); Enhanced Convolutional Neural Network (ECNN); Viola Jones algorithm Speeded Up Robust Feature (SURF)

1 Introduction

The rapid development in video editing application has ended video forgery an easy task. Hence, the trustworthiness of hypermedia matters, particularly videos, as a proof is a cumbersome task. The growth of images processing software and the progression in cameras (digital) has brought about a significant amount of doctored images with no noticeable traces, creating a high demand for automatic forgery detection algorithms to ascertain the honesty of a candidate image [1]. Nowadays, it produces considerable difficulty in authenticating images. Image forgery implies the manipulation of the image (digital) to cover some essential or helpful information as of it [2]. Many research works focused on image forgery detection (IFD). The disclosure of the forgery algorithm will depend on the image source [3].



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Energy efficient clustering with disease diagnosis model for IoT based sustainable healthcare systems

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ABSTRACT

Sustainable energy efficient networking models are needed to satisfy the increasing demands of the information and communication technologies (ICT) applications like healthcare, smart cities, education, and so on. The futuristic sustainable computing solutions in e-healthcare applications are based on the Internet of Things (IoT) and cloud computing platform, has offered numerous features and real time services. Several studies revealed that the amount of energy spent on transmitting data from IoT devices to a cloud server is considerably high and resulted in rapid energy depletion. In this view, this paper presents an Energy Efficient Particle Swarm Optimization (PSO) based Clustering (EEPSOC) technique for the effective selection of cluster heads (CHs) among diverse IoT devices. The IoT devices used for sensing healthcare data are grouped into a form of clusters and a CH will be elected by the use of EEPSOC. The elected CH will forward the data to the cloud server. Then, the CH is responsible for transmitting data of the IoT devices to the cloud server through fog devices. Next to that, an artificial neural network (ANN) based classification model is applied to diagnose the healthcare data in the cloud server to identify the severity of the diseases. For experimentation, a systematic student perspective healthcare data is produced utilizing UCI dataset and medicinal gadgets to foresee the diverse student levels of disease severity. A detailed comparative analysis is carried out and the simulation outcome ensured the goodness of the EEPSOC-ANN model over the compared methods under various aspects.

1. Introduction

In the present context of the Internet of Things (IoT), the likelihood of developing sustainable, smart and energy efficient applications in diverse platforms like rural, urban, and industrial is a reality enabled by advanced sensing and communication technologies. They are in a situation to deliver highly reliable data with maximum energy efficiency [1]. The current proliferation of data and communication methods as well as embedded systems tends to develop a novel technology named as IoT. IoT allows user and things from real world and enables virtual platforms to communicate with one another. Various domains are applied with IoT model as the major data acquisition process at modern

environment like modern vehicle, modern homes, modern healthcare, as well as modern cities are considered to be the portion of developing digital community. Because of the rapid development in IoT-centric systems, there are several capable studies focused on medicinal and sensing components and smart healthcare. Due to the increasing expense of healthcare and also existence of several ailments, it requires the conversion of healthcare from hospital based model to a patient-centered platform. Based on the disease management as well as personal well-being issue, it has been presented a technique with autonomous sensing abilities of IoT devices to forecast the probabilities of severe disease.

IoT and Cloud Computing (CC) are integrated to one another [2]. The

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Forward feature extraction from imbalanced microarray datasets using wrapper based incremental genetic algorithm

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Abstract: Learning from imbalanced datasets is a critical challenge confronting researchers. Unequal distribution of classes in the imbalanced datasets lead to biased classification especially in microarray gene expression analysis. Since all features in the dataset will not contribute to the analysis, only prominent and significant features need to be identified. The paper addresses both these issues by proposing wrapper based incremental genetic algorithm (IGA) which incrementally evaluates and adds attributes into the genetic algorithm process rather than evaluation of all attributes thereby reducing the computational complexity and number of features used and improving the measures like classification accuracy, GMean, F1 measure, precision and recall. The experiments are conducted on 8 microarray gene expression datasets and the results show that performance of IGA is encouraging and superior to existing methods that are compared.

Keywords: incremental genetic algorithm; IGA; imbalanced dataset; bootstrap sampling; forward feature extraction; adaptive mutation.

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Effective Face Recognition System Using Hybrid Principal Component Analysis For Real-Time Application

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Abstract:- In Principal component Analysis the facial Features are in form of Eigen-values. In Linear Discriminant Analysis (LDA) the Facial features are in form of Fisher Discriminants. The major disadvantage of the existing system is that minute Discriminants are impossible due to the application of binarylogic. In this paper a Hybrid Principal Component Analysis (HPCA) face-verification method is proposed for the high-resolution face authentication task with the eigenapproach. The Wavelet is a Powerful tool to analyze and process image signals. It is mainly used for dimensionality reduction. The facial expressions with low dimensional subspace can be obtained through the Fishers linear discriminant on fuzzy method. Variations in light and variations in facial expressions will not affect the recognition. The proposed algorithm helps to future extraction based on local and global trained features and increases the accuracy Upto 3% percentage.it is MATrix LABORatory tool (MATLAB) the experimental results shows recognition rate increases compare to other technique.

Keywords: Image processing, Security, Egien faces, face recognition, Principal component analysis.

I. INTRODUCTION

In recent years, there is tremendous advancement in the arena of picture handling. Current age Personal Computers are getting more brilliant and quicker to progression Terabyte of information. Item acknowledgment that picked up consideration in the field as a result of its usefulness in businesses, for example, producing, pressing and so forth. Grocery store is the normal model and that utilizes a standardized tag to distinguish an item. An assembling unit utilizes a gadget that necessities to discover the situation of the article precisely. For instance, the jug filler automated arm needs a Personal computer visualization is utilized to identify the basic idea of the object. Personal computer visualization permits the Personal computer to detect the object with different bursting motion. The human eye similar to camera getting the information like hotspot to PC.

There are different types of applications and necessities to find the face in different in motion picture



L_1 norm based pedestrian detection using video analytics technique

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Abstract

Pedestrian detection from images of the visible spectrum is a high relevant area of research given its potential impact in the design of pedestrian protection systems. In general, detection is made with two different phases, feature extraction and classification. Also, features for detection of pedestrian are already available such as optimal feature model. But still required is an improvement in detection by reducing the execution time and false positive. The proposed model has three different phases, that is, background subtraction, feature extraction, and classification. In spite of giving entire information into feature extraction, the system gives only a useful information (foreground image) by twin background model. Then the foreground image moves to the feature extraction and classifies the pedestrian. For feature extraction, histogram of orientation gradient (HOG) L_1 normalization has been used. This will increase the detection accuracy and reduce the computation time of a process. In addition, false positive rate has been minimized.

KEYWORDS

HOG, human detection, pedestrian detection, SVM, twin background model



An intelligent based healthcare security monitoring schemes for detection of node replication attack in wireless sensor networks

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ABSTRACT

Due to the increased growth of elderly people in recent years, healthcare systems face many challenges on the money spent for those people. Both quality and affordability has to be provided by the new technology which is the today's need. When applying WSN technologies, the advantages such as continuous monitoring with alert mechanisms and relative information are to be satisfied. Among the other challenges, due to the deployed environment, security is a key challenge. As gateway connects to the wireless networks, it is the target area for many adversaries to launch various attacks. Initially, attacker launches node compromise attack which leads to node replication attack. The introduced security methods for intelligent healthcare monitoring system effectively detect replication attack and provide protection to the system. The potential application of proposed methods namely Exponential Moving Average based Replica Detection (EMABRD), Secured Ant Colony Optimization (SACOP) and Fingerprint based Zero Knowledge Authentication (FZKA) is applied to a real time environment. While comparing three algorithms, SACOP has higher detection probability of malicious nodes at the expense of increased storage and communication overheads over EMABRD and FZKA. FZKA performs better compared to EMABRD in terms of detection probability but at the cost of increased overheads. So, among the three algorithms, EMABRD is better in terms of overheads and SACOP is better in terms of detection probability.

1. Introduction

Recent advances in the technologies of WSN have gained attention towards various fields like healthcare, entertainment, industry, retail and travel and emergency management in order to improve the quality of life [1,2]. During recent years, healthcare monitoring system has been paid more attention because of tremendous growth in technology in spite of its security challenge. The performance of WSNs is affected by challenges, potential threats and vulnerabilities of healthcare monitoring system.

Due to the increased growth of elderly people in recent years, healthcare systems face many challenges on the money spent for those people. Both quality and affordability have to be provided by the new technology which is the today's need [3]. When applying WSN technologies, the advantages such as continuous monitoring with alert mechanisms and relative information are to be satisfied. In terms of quality and cost, WSN is one among the possible technologies providing a viable solution.

Moreover, in connecting wearable devices, WSN plays a major role [6]. As the continuous and close monitoring of the individuals provided by wearable devices, flawless health status is maintained. When combining these systems with telemedicine, alert message is generated when an abnormal situation occurs. In order to track the recovery and diagnosis of health issues [29] on long term monitoring, an integrated wearable device [30] is focused. In Kakria et al [4], with such technology, patients with cardiac problems have been monitored successfully.

For various monitoring operations such as drug therapy, knee surgery, and brain trauma rehabilitation, an integrated system is used. For simple pulse monitors, to monitor Holter (an occasionally ambulatory electrocardiography device) and day-to-day activities [5,7], the wearable devices have been used nowadays as indicated in Shanmugam maheswaran et al [3]. Fall detection, location detection and posture detection are some of the applications under focus. To integrate with some substances to embed in the body, research works concentrates in developing tiny sensors recently.

The challenges of static WSN towards healthcare monitoring system

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Load Balancing in Software-Defined Networks Using Spider Monkey Optimization Algorithm for the Internet of Things

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Abstract

In the Internet of Things (IoT), the number of devices connected to the internet, and they can collect and exchange information at any time. IoT is helpful for the progress of a smart city and different applications. Software-Defined Network (SDN) offers programmability and flexibility in the IoT network. Nevertheless, the adoption of the number of gadgets will increase the transmission delay and this will lead the network to heavy loaded. To overcome this issue, an efficient load balancing technique has to be presented in the SDN network. By considering this solution as an aim, spider monkey optimization algorithm based load balancing (LB-SMOA) is presented in this paper. Using this technique, the controller with minimum load is selected and this selected controller balances the load of the heavily loaded controller. Simulation results show that the performance of the proposed LB-SMOA outperforms the existing load balancing techniques in terms of average response time, packet loss rate, and throughput.

Keywords Internet of Things (IoT) · Software defined network (SDN) · Load balancing · Spider monkey optimization algorithm · SDN controller

1 Introduction

In the future, Billions of gadgets will be associated with the internet. Accordingly, it is normally a genuine insurgency on the measure of information accumulated and shared. This is known as the Internet of Things (IoT) [1–4]. For the most part, physical gadgets furnished with RFID labels, actuators, remote sensors, as well as remote communication gadgets are associated with the Internet to shape IoT arrange. These gadgets are explicitly conveyed in application setting to take part in making a smart situation going from cell systems to Machine-to-Machine (M2M) correspondence, from vehicular systems to remote sensor systems, and in embedded frameworks, and so forth. IoT gateways are key empowering influences for IoT and regularly comprise of small gateways that can interconnect dispersed

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An Improved Machine Learning Approach for Predicting Ischemic Stroke

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Abstract: Stroke occurs when appearing the blockage of tissues of the brain of blood coagulation. This obstruction can show up at the collar or in the brain. Clot, as a rule, begins in the heart and moves by the circulatory context. Clotting can be distinct all unaided or get stopped in a strip. When it obstructs a mind corridor, the cerebrum doesn't get enough blood or oxygen, and cells begin to die. Stroke is the major cause of blockage of blood in tissues where the brain's oxygen and blood supply. Enters of disease control and prevention decide stroke is one of the main reasons for death. In the US, 7 95,000 peoples have a stroke in the year 2020. The major symptoms are trouble walking, trouble speaking, loss of balance, blurred vision, etc. This research mainly focuses on finding the stroke and the major types of strokes. Stroke is a major role in the peoples who have suffered more. This research uses Recursive Feature Elimination using the Cross-Validation (RFECV) algorithm to eliminate similar strokes.

Keywords: Ischemic Stroke, Machine Learning, IST Dataset, Elimination, Classification Modules, Prediction

I. INTRODUCTION

A. Machine Learning

Machine learning is the subtype of Artificial Intelligent (AI); it finds useful patterns for problems in the large dataset based on existing algorithms. Machine learning systems automatically developed and learned the models and enhanced the system from experience without planning. In recent days, a huge amount of data is accessible worldwide, and essential to analyze it. Experiments on real-world problems in the domain of the medical field, machine learning develops good performance. Machine learning is vital in the medical domain with computerized intelligence systems [1-3].

B. Stroke

Intense stroke is acerebral infarction, and this term was not favored by the nervous system specialists. An important word of blockage is a block of tissues, comparable to 'respiratory failure.' Intense blockage of tissues is characterized by intense central neural discoveries in block tissues because of fundamental cerebrovascular sickness. In America, 8 lakh strokes in every 365 days. In Each clockwork, a new stroke was identified. Blockage of tissues is the fifth driving reason for death and the principal driving reason for incapacity. Two primary sorts of strokes. Everyday primary sort of ischemic stroke, brought about by the interference of hemoglobin stream that specific region of the cerebrum. Blockage of blood represents 85 percent of every single intense stroke. 15% of intense strokes are hemorrhagic strokes, which are brought about by blasting a vein, such as Haemorrhagic stroke.

As indicated by the grouping, it classified into primary kinds of ischemic strokes. Big vessel atherosclerotic, little tissue sicknesses (lacunar defect), cardioembolic stroke, and cryptogenic stroke. It also has various causes and physiological effects. In any case, sort of strokes, Critical to realizing that every moment of enormous stroke is untreated, nearly 2,000,000 neurons died. This is the main 'time is mind' to understand intense stroke and its therapy.

C. Risk Prediction

A danger risk expectation model is a numerical condition that utilizes persistent danger factor information to assess the live hood encountering a medical care outcome. Many measurable types should be utilized to build up a danger forecast model, including yet not restricted to strategic relapse, direct relapse, Cox relapse, and machine learning. The result can likewise be either parallel or consistent. Most dangerous expectation models in the cardiothoracic writing are created utilizing multivariable strategic relapse to anticipate a twofold result. The emphasis





Automated tomato leaf disease classification using transfer learning-based deep convolution neural network

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Abstract

Early and accurate detection of plant diseases is necessary to maximize crop yield. The artificial intelligence based deep learning method plays a vital role in the detection of the diseases using a huge volume of plant leaves images. However, to detect disease with small datasets is a challenging task using deep learning methods. Transfer learning is one of the popular deep learning methods used to accurately detect plant disease with minimal plant image data. In this paper, the transfer learning-based deep convolution neural network model to identify tomato leaf disease has proposed. The model performs detection of disease using real-time images and stored tomato plant images. Furthermore, the performance of the proposed model is evaluated using adaptive moment estimation (Adam), stochastic gradient descent (SGD), and RMSprop optimizers. The experimental result demonstrates that the proposed model using the transfer learning approach is effective in automated tomato leaf disease classification. The Adam optimizer achieves better accuracy compared with SGD and RMSprop optimizers.

Keywords Deep convolution neural network · Tomato leaf disease · Transfer learning · Feature extraction · Disease classification · Fine-tuning

Introduction

In today's world, agriculture using modern technologies produces a sufficient amount of food to meet the people demands and the economy of India also depends on its productivity (Singh and Misra 2017). However, the safety of food remains challenging owing to factors such as climatic changes (Tai et al. 2014), a decline in pollinators (Pollinators 2016), plant diseases (Strange and Scott 2005), and others. Tomato cultivation is widespread throughout the world which has rich nutrition, as a result, it plays a significant

role in the world's agricultural production and trade (Zhang et al. 2018). Tomato occupies a prominent place among the vegetable crops worldwide and its production is considerably increased through the years based on the statistics from the Food and Agriculture Organization of the United Nations around the world (Food and Agriculture Organization of the United Nations 2015). In tomato cultivation, diseases are considered as one of the major factors which lessen production and cause remarkable losses in the agriculture economy (Hanssen and Lapidot 2012). For instance, early blight and late blight are the most common diseases that can cause extreme harm in crop yields (Blancard 2012).

In India, smallholding farmers contribute more than 80 percent of agricultural production (International Fund for Agricultural Development 2013) and report 50 percent of crop yield loss due to diseases (Harvey et al. 2014). Over the past decades, plant diseases are identified by experts over a bare eye. This approach shows a lack of accuracy and unavailability of experts in rural areas (Vibhute and Bodhe 2012). Early detection of diseases allows to take preventive measures against the pathogens. Automated classification of plant diseases using leaf images can detect the possibility of diseases more accurately when compared to machine

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Secure Remote User Authentication Scheme on Health Care, IoT and Cloud Applications: A Multilayer Systematic Survey

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Abstract: Secure remote user authentication is an authentication technique in which the remote server authorizes the identity of the user through an insecure communication network. Since then diverse remote user authentication schemes have been proposed, but each category has its advantages and disadvantages. Besides its strength and weakness, remote user authentication systems have a great impact on real-time applications such as E-health applications, telemedicine applications, Internet of Things (IoT), Cloud, and Multi-server applications. The implementation of the Tele Medicine Information System (TMIS) over public networks continues to disclose confidential information to unauthorized entities. Similarly, remote user authentication techniques have become essential in accelerating IoT as well. Security is a major concern in IoT because it allows secure access to remote services. Cloud computing services and a Multi-server environment share data among different end-users through the internet which also needs security as its paramount concern. Although intensive efforts were made in designing remote user authentication scheme for health care, IoT, Multi-server and cloud applications, the majority of these applications suffers either from security attacks or lagging of critical features. This paper presents an analytical and comprehensive survey of various remote user authentication techniques and categorizes them based on different applications. Furthermore, the state of art recent remote user authentication techniques have been compared, their advantages, key features, computational cost, storage cost, and communication cost are highlighted.

Keywords: remote user authentication; e-health; telemedicine; internet of things; multi-server; security



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Design and implementation of image classification based convolutional neural networks on hardware

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Abstract

In recent years, deep learning has grown rapidly. It was used in many fields especially artificial intelligence areas. A strong direction for methodology is the combination of deep learning and embedded systems. The project will design a deep neural network learning algorithm, which can be applied on hardware, such as FPGA. The research on the deep learning neural network and hardware is focused on existing research. As assistant tools, it uses PyTorch and CUDA. This work is focused on a convolutionary neural network image classification (CNN). Many good models such as ResNet, ResNeXt and MobileNet can be tested. An algorithm with the MobileNet model will be determined by adding these models to the design. Models such as FLOPs, number of parameters and classification accuracy are chosen in several ways. The mobile net-based algorithm is chosen, for applications with a 6-class data collection, with a 5.5 percent top-1 error. The MobileNet based algorithm also requires the hardware simulation.

FEEDBACK



An Enhanced Green Cloud Based Queue Management (GCQM) System to Optimize Energy Consumption in Mobile Edge Computing

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Abstract

The mobile users have acquired the benefits of cloud computing with the help of Mobile Edge Computing (MEC) technology in order to satisfy the increasing data demands. The efficiency of the system is highly limited by the bandwidth limitations and limitations associated with the mobile devices despite the rapid development of MEC as well as the cloud computing technology. Our aim is to provide an optimal method to optimize the energy consumption in the mobile edge computing. In this regard, the research paper proposed a Green Cloud based Queue Management system for 5G networks that helps in addressing the issues related to latency and energy consumption. While serving the users, the proposed methodology results in less amount of energy being wasted and hence the reduced latency. By means of alleviating the congestion and implementing the virtual list, this issue can be resolved greatly. Simulation is done with the help of NS2 green cloud simulator and the results are obtained by comparing the proposed model to conventional cloud model and cloudlet based on throughput, latency, energy consumption and normalized overhead as these are the evaluation measures. The results show that there has been considerable enhancement in the energy consumption. As the throughput increases, the quality of the service also increases.

Keywords Mobile edge computing · Green cloud · Virtual list · Congestion control · Queue management · Cloudlet

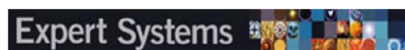
1 Introduction

The wireless network in the coming years is expected to handle huge amount of data in the factor of 100. Apart from this there has also been an exponential increase in the mobile devices and their corresponding data rates. In such cases it is essential to identify the requirements to meet the increasing demands. The 5G elements requires certain elements for representation which includes latency also called as round-trip delay, network

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ORIGINAL ARTICLE



WILEY

A proactive model to predict osteoporosis: An artificial immune system approach

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Abstract

Osteoporosis disease is caused by hormonal changes, vitamin D, and calcium deficiency. With current technologies, the identification of osteoporosis requires many tests with the support of medications. Bone mineral density is a typical measure implemented using a DEXA scan which can be very costly. Such high technology equipment is usually not accessible for remote people, and thus a low-cost screening system is very appealing. This article proposes an osteoporosis prediction system that effectively determines its possibility of occurrence based on essential factors such as smoking habits and calcium level so that the people at high risk can be referred to access the DEXA scanner. Our proposed system is implemented by an improved version of the artificial immune system, enabling care providers to take precautionary measures at the right time to avoid the early development of osteoporosis. The experiments demonstrated a promising result of 94% prediction accuracy that proved its usefulness in identifying people with potential osteoporosis in the future.

KEYWORDS

artificial immune system, bio-inspired, bone mineral density, classifiers, convolutional neural network, machine learning, osteoporosis

1 | INTRODUCTION

The skeleton of our human system comprises bones, and they support our body in getting the shape and support. Also, at the time of injury, they safely care for our internal organs, which are soft, like our heart and brain. The strong bones, along with the muscles, help in moving the body freely. To our notice, people over 200 million get affected by osteoporosis, causing 8.9 million fracture cases per year globally (Kastner et al., 2018). The bones with their outer surface, solid in nature, are termed compact bone. Spongy bones are another form of our human bones, which are the inner bones and are less dense when compared to compact bones. They will also have holes that are too tiny to be visible. The human bones contain two forms of cells. The first one is osteoblasts that help our human system to construct bone tissues using calcium and phosphate. The other form is osteoclasts that always try to break down the tissues of the bone. Several hormones, like internal secretion hormone, androgenic hormone, and sex hormone, facilitate to keep the amount and secretion of osteoblasts over osteoclasts such that fewer bones are removed than created. People can build their bones denser and stronger by continuous exercise with physical pressure. Continuous exercising helps young adults' and youngsters' bones to grow sturdy. Individuals in their 30s usually have stronger bones, which are also denser, showing a high rate of peak bone mass. After the 30s, it starts reducing gradually since the count of osteoclasts gets increased over the count of osteoblasts. As a result of the weakening of bones, osteoporosis may cause fractures and easy breaking of bones.

Bones that are healthy and strong always will be able to defend and support the body. It can also handle minor injuries and stresses of movement. Most of the people affected by osteoporosis have an abnormal type of skinny bones with holes in spongy bones. Osteoporosis may be of two kinds. Primary osteoporosis is typically associated with older age, likewise as a reduced quantity of sex hormone in girls; secondary

Hybrid Swarm Intelligence Based QoS Aware Clustering with Routing Protocol for WSN

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Abstract: Wireless Sensor Networks (WSN) started gaining attention due to its wide application in the fields of data collection and information processing. The recent advancements in multimedia sensors demand the Quality of Service (QoS) be maintained up to certain standards. The restrictions and requirements in QoS management completely depend upon the nature of target application. Some of the major QoS parameters in WSN are energy efficiency, network lifetime, delay and throughput. In this scenario, clustering and routing are considered as the most effective techniques to meet the demands of QoS. Since they are treated as NP (Non-deterministic Polynomial-time) hard problem, Swarm Intelligence (SI) techniques can be implemented. The current research work introduces a new QoS aware Clustering and Routing-based technique using Swarm Intelligence (QoSCRSI) algorithm. The proposed QoSCRSI technique performs two-level clustering and proficient routing. Initially, the fuzzy is hybridized with Glowworm Swarm Optimization (GSO)-based clustering (HFGSOC) technique for optimal selection of Cluster Heads (CHs). Here, Quantum Salp Swarm optimization Algorithm (QSSA)-based routing technique (QSSAR) is utilized to select the possible routes in the network. In order to evaluate the performance of the proposed QoSCRSI technique, the authors conducted extensive simulation analysis with varying node counts. The experimental outcomes, obtained from the proposed QoSCRSI technique, apparently proved that the technique is better compared to other state-of-the-art techniques in terms of energy efficiency, network lifetime, overhead, throughput, and delay.

Keywords: Quality of service; clustering; routing; energy efficiency; wireless sensor networks; swarm intelligence



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Integrating HSICBFO and FWSMOTE algorithm-prediction through risk factors in cervical cancer

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Abstract

The prominent objective of cervical carcinoma (CC) prediction lies in the optimal feature selection and balanced data. The problem of majority and minority class samples are solved in the proposed work. The objective of the work lies in solving imbalanced data distribution, and of risk factor validation in cervical cancer prediction. Feature Weighted Synthetic Minority Oversampling Technique (FWSMOTE) algorithm solves the minority class issues. The missing data imputation is performed by the Mode and Median Missing Data imputation. For optimal feature selection, Hilbert–Schmidt Independence Criterion with Bacteria Forage Optimization (HSICBFO) algorithm is implemented. Ensemble Support Vector Machine with Interpolation classifier is used for cancer prediction. Various measures are deployed to analyze the performance of the proposed classifier and produces 94.77%, 93.38%, 93.86%, 94.07%, 93.60% and 93.62% for precision, recall, specificity, F-Measure, accuracy and G-mean that helps in identifying the risk level of cervical carcinoma development and guidance for further diagnosis.

Keywords Cervical carcinoma (CC) · Minority class · Data imputation · Measures · Classification · Risk factor

1 Introduction

In worldwide, cervical carcinoma (CC) has huge impermanency among women. A leading mortality cancer among women is Cervical cancer (CC) with new cases of 500,000 and incidences is about 250,000 in 2012 (William and Miller 2012). High risk factor of CC includes Human Papilloma-Virus (HPV) infection but not sufficient for malignancy initiation (Tjalma et al. 2005). HPV screening proves to be a greater protection against the malignant cervical carcinoma when compared to the pap smear testing (Geeitha and Thangamani 2020). Besides HPV infection, some factors increase the risk of carcinoma such as smoking, usage of birth control pills for contiguous five years, more sexual parity, etc., (Singh et al. 2018). Additionally, some information

that include victim's past medical records reveals the fact that age group falling between 50 and 69 were found be highly infected with this carcinogenesis (Kour et al. 2010). Progression from precancerous disorder to invasive cancer can be avoided using genetic alterations (Martin et al. 2009). Cancer research uses the profile of gene expression. Numerous techniques are being implemented for identifying different factors of CC. Few polymorphisms have shown their consistency. Patterns of the gene expression are combined with statistical techniques to be used in various cancer types (Huang and Yu 2013; Zheng et al. 2011). Behavior of cancer cells can be understood by studying the individual genes in different carcinoma cells. Few studies used those methods in genomic scale (Rhodes et al. 2004; Segal et al. 2004).

Important information to the policy and decision makers are given by the quantification of CC rate. Population-based registries are used to get a CC's accurate measure. The estimation of the disease occurrence is defined in a clear-cut population. In cancer registries, the data collection quality and completeness, precise and consistent measures of inhabitants play a vital role (Sharma et al. 2013). The prediction models are affected by variations in the clinical outcome and it makes the process of identifying treatment protocols to CC as a complicated one (Hu et al. 2010). Target-gene

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A geodesic deployment and radial shaped clustering (RSC) algorithm with statistical aggregation in sensor networks

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Abstract: Wireless sensor networks (WSN) comprise a large number of connected tiny or small sensor devices to sense physical phenomenon. In WSN, prolonging the network's lifetime is a biggest challenge due to absence of power harvesting facility and irreplaceable batteries of the sensor devices. Clustering is one of the widely accepted and standard technique to solve the energy issues faced in WSN. In addition to clustering, the shape of the deployment area also plays the major role especially for large scale sensor deployment. This paper proposes a radial shaped clustering (RSC) algorithm with angular inclination routing. The radial shaped deployed area is divided into virtual concentric layers and each layer is further divided into a set of sectors called clusters. Angular routing is applied to achieve multihop routing of packets towards the Sink node. In comparison to fan shaped clustering (FSC), RSC performs better in terms of residual energy and packet received ratio.

Key words: Wireless sensor networks, network lifetime, radial shaped clustering, node deployment, angular routing

1. Introduction to the area

In most of the legitimate applications, the sensor nodes are used in large-scale area and are applied preferably for better reliability and efficiency. WSN comprises of great quantities of sensors with the capability of sensing as well as communication, which means cooperatively collecting data and sending them to the coordinator called Sink. The main objective of sensor node deployment is to monitor the physical phenomenon, to process the sensed information, and to transfer the information to a center known as Sink. In general, the sensor nodes are powered by batteries, which are very limited in power and mostly irreplaceable [1–3]. Sensor nodes, depending on the nature of application, may have very minimum range of transmission. So, the parsimonious utilization of power is of utmost importance. So, a network of sensor nodes is essential to propagate their data to a longer distance.

One of the most widely accepted unique practices for data gathering is clustering where the sensor devices are grouped into a number of clusters that can be used for conserving the energy. Each cluster may have a group of nodes called cluster members and a reporting point to send the sensed data known as cluster head (CH). Each sensing node does its duty and the sensed data is transmitted to the CH located within that cluster. Then, the head collects the entire data, aggregate it by using any aggregation measure, makes them a single unique packet, and transmits data to the coordinator. Here, the capacity of network is balanced in addition

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JULY MONTH RESEARCH WORK

Hybrid and dynamic clustering b

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Hybrid and dynamic clustering based data aggregation and routing for wireless sensor networks

Cite

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Abstract: In Wireless Sensor Networks (WSNs), effective transmission with acceptable degradation in the power of sensor nodes is a key challenge. In a large network, holdup is bound to occur in communicating superfluous data. The aforementioned issues namely, energy, delay and data

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Miniaturized Five-Band Perfect Metamaterial THz Absorber with Small Frequency Ratio

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Abstract

A five-band polarization-insensitive perfect metamaterial absorber (PMA) is reported in this paper for THz detection and sensing applications. The proposed absorber is constructed using interconnected circular ring elements enclosed by a square loop. The ring elements are interconnected using short strip lines which increases the electrical length to offer resonance at the lower frequencies of the THz regime without increasing the electrical length. The proposed absorber has a footprint of $0.12 \lambda_{\text{eff}} \times 0.12 \lambda_{\text{eff}}$ where λ_{eff} is the effective wavelength calculated at the lowest operating frequency. The absorber provides 92%, 84%, 90%, 100%, and 100% absorption at 0.24, 0.56, 0.65, 0.82, and 0.95 THz, respectively. The proposed structure offers structural symmetry, and hence, it is polarization-insensitive. The proposed five-band absorber has good angular stability consistent with many research works reported in the literature and has a small frequency ratio of 1:2.3:2.7:3.4:3.9. The proposed absorber can be used as a permittivity sensor and its sensitivity is estimated to vary from 5.8 GHz/permittivity unit (PU) to 23.56 GHz/PU.

Keywords THz absorbers · Five-band resonances · Metamaterial · THz sensors and detectors

Introduction

With the rapid increase in the demand for high data rate systems, researchers are continuously exploring high frequencies for use in information and communication. Terahertz (THz) communications have gained momentum in the recent past which has led to the development of novel components for use in THz systems. One such component is the THz absorber which is predominantly used in applications such as sensing, THz imaging, and detection. THz frequencies in the range of 0.1–10 THz is less explored, and hence, researchers worldwide are developing novel components for use in the above said electromagnetic spectrum. With the advent of intelligent algorithms, the sensor performance has been greatly increased in recent times. The intelligent algorithms include the soft computing and neuro fuzzy techniques as described in [1–10]. The intelligent algorithms discussed in

[1–10] describe the efficiency enhancement of sensor performance in the IR and mid-IR and THz frequency ranges. Thus, the research on novel THz sensors becomes a need of the hour. Though several parameters can be taken as reference in estimating sensing performance, this research predominantly focuses on the absorption characteristics of the metamaterials to accomplish sensing.

In literature, THz absorbers are developed using perfect metamaterials which provide interesting properties such as high absorptivity and better stability. Since naturally occurring materials do not provide enough design flexibility at THz frequencies, metamaterials are the perfect choice for the development of THz absorbers. Landy et al. in 2008 [11] first developed a perfect metamaterial absorber (PMA) for use in the THz range. Since then, several researchers have attempted to develop PMA using interesting unit cells. In the earlier research, the attention was on the development of single narrow band absorbers which is limited by poor resolution. However, due to the modern technological requirement, the design of multiband and broadband PMA has attained a research focus. This is because multiband/broadband THz absorbers provide better sensitivity and higher stability. The multiband PMAs are realized using

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Novel tri-band series fed microstrip antenna array for THz MIMO communications

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Abstract

A novel tri-band series fed microstrip two-element array antenna is reported in this paper for Terahertz (THz) multiple-input multiple-output (MIMO) communications. Each series-fed array consists of four radiating sections constructed using graphene material. The radiating sections consist of a square loop loaded with a diamond-shaped radiator to offer multi-frequency operation. The proposed antenna operates at 2.3 THz, 3.2 THz and 4.5 THz. The antenna offers an effective 10 dB reflection coefficient bandwidth of 38 GHz, 43 GHz and 60 GHz centred at 2.3 THz, 3.2 THz and 4.5 THz respectively. The isolation enhancement between the antenna elements is achieved using a serpentine resonator. The port-to-port isolation is greater than 15 dB in all the operating bands. The realized antenna gain is greater than 5 dBi in all the operating frequencies. The MIMO metrics of the proposed two-element antenna array is estimated and the results are presented. The envelope correlation coefficient (ECC) is less than 0.2, the diversity gain is close to the theoretical limit of 10 dB and the mean effective gain is close to unity.

Keywords THz antennas · MIMO antennas · Isolation enhancement

1 Introduction

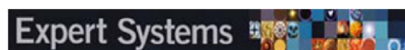
THz communications have received a recent research momentum due to its capability of offering a high data rate. THz occupies the electromagnetic spectrum between the microwave band and the infra-red region. The frequency range between 0.1 and 10 THz has received considerable attention in the recent past due to its attractive features such as good penetration characteristics with minimal attenuation, non-ionizing radiation with very low power level requirement, less scattering and capability to collimate with good ease (Mukherjee and Gupta 2008). These advantages enable the use of THz wave in imaging and spectroscopy applications. Researchers worldwide are currently involved in the design of novel components and circuits that can be used for THz communications. The importance of MIMO systems at the THz spectrum is widely studied by researchers in Faisal

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ORIGINAL ARTICLE



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A proactive model to predict osteoporosis: An artificial immune system approach

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Abstract

Osteoporosis disease is caused by hormonal changes, vitamin D, and calcium deficiency. With current technologies, the identification of osteoporosis requires many tests with the support of medications. Bone mineral density is a typical measure implemented using a DEXA scan which can be very costly. Such high technology equipment is usually not accessible for remote people, and thus a low-cost screening system is very appealing. This article proposes an osteoporosis prediction system that effectively determines its possibility of occurrence based on essential factors such as smoking habits and calcium level so that the people at high risk can be referred to access the DEXA scanner. Our proposed system is implemented by an improved version of the artificial immune system, enabling care providers to take precautionary measures at the right time to avoid the early development of osteoporosis. The experiments demonstrated a promising result of 94% prediction accuracy that proved its usefulness in identifying people with potential osteoporosis in the future.

KEYWORDS

artificial immune system, bio-inspired, bone mineral density, classifiers, convolutional neural network, machine learning, osteoporosis

1 | INTRODUCTION

The skeleton of our human system comprises bones, and they support our body in getting the shape and support. Also, at the time of injury, they safely care for our internal organs, which are soft, like our heart and brain. The strong bones, along with the muscles, help in moving the body freely. To our notice, people over 200 million get affected by osteoporosis, causing 8.9 million fracture cases per year globally (Kastner et al., 2018). The bones with their outer surface, solid in nature, are termed compact bone. Spongy bones are another form of our human bones, which are the inner bones and are less dense when compared to compact bones. They will also have holes that are too tiny to be visible. The human bones contain two forms of cells. The first one is osteoblasts that help our human system to construct bone tissues using calcium and phosphate. The other form is osteoclasts that always try to break down the tissues of the bone. Several hormones, like internal secretion hormone, androgenic hormone, and sex hormone, facilitate to keep the amount and secretion of osteoblasts over osteoclasts such that fewer bones are removed than created. People can build their bones denser and stronger by continuous exercise with physical pressure. Continuous exercising helps young adults' and youngsters' bones to grow sturdy. Individuals in their 30s usually have stronger bones, which are also denser, showing a high rate of peak bone mass. After the 30s, it starts reducing gradually since the count of osteoclasts gets increased over the count of osteoblasts. As a result of the weakening of bones, osteoporosis may cause fractures and easy breaking of bones.

Bones that are healthy and strong always will be able to defend and support the body. It can also handle minor injuries and stresses of movement. Most of the people affected by osteoporosis have an abnormal type of skinny bones with holes in spongy bones. Osteoporosis may be of two kinds. Primary osteoporosis is typically associated with older age, likewise as a reduced quantity of sex hormone in girls; secondary

Network Traffic Prediction Using Radial Kernelized-Tversky Indexes-Based Multilayer Classifier

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Received: 09 April 2021; Accepted: 15 May 2021

Abstract: Accurate cellular network traffic prediction is a crucial task to access Internet services for various devices at any time. With the use of mobile devices, communication services generate numerous data for every moment. Given the increasing dense population of data, traffic learning and prediction are the main components to substantially enhance the effectiveness of demand-aware resource allocation. A novel deep learning technique called radial kernelized LSTM-based connectionist Tversky multilayer deep structure learning (RKLSTM-CTMDSL) model is introduced for traffic prediction with superior accuracy and minimal time consumption. The RKLSTM-CTMDSL model performs attribute selection and classification processes for cellular traffic prediction. In this model, the connectionist Tversky multilayer deep structure learning includes multiple layers for traffic prediction. A large volume of spatial-temporal data are considered as an input-to-input layer. Thereafter, input data are transmitted to hidden layer 1, where a radial kernelized long short-term memory architecture is designed for the relevant attribute selection using activation function results. After obtaining the relevant attributes, the selected attributes are given to the next layer. Tversky index function is used in this layer to compute similarities among the training and testing traffic patterns. Tversky similarity index outcomes are given to the output layer. Similarity value is used as basis to classify data as heavy network or normal traffic. Thus, cellular network traffic prediction is presented with minimal error rate using the RKLSTM-CTMDSL model. Comparative evaluation proved that the RKLSTM-CTMDSL model outperforms conventional methods.

Keywords: Cellular network traffic prediction; connectionist Tversky multilayer; deep structure learning; attribute selection; classification; radial kernelized long short-term memory

1 Introduction

Cellular network communication is a most admired and ubiquitous telecommunication technology. A mobile cellular network creates huge spatial and temporal data. Analysis of such a volume of big data



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Energy Efficient QoS Aware Cluster Based Multihop Routing Protocol for WSN

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Abstract: Wireless sensor networks (WSN) have become a hot research area owing to the unique characteristics and applicability in diverse application areas. Clustering and routing techniques can be considered as an NP hard optimization problem, which can be addressed by metaheuristic optimization algorithms. With this motivation, this study presents a chaotic sandpiper optimization algorithm based clustering with groundwater flow optimization based routing technique (CSPOC-GFLR). The goal of the CSPOC-GFLR technique is to cluster the sensor nodes in WSN and elect an optimal set of routes with an intention of achieving energy efficiency and maximizing network lifetime. The CSPOC algorithm is derived by incorporating the concepts of chaos theory to boost the global optimization capability of the SPOC algorithm. The CSPOC technique elects an optimum set of cluster heads (CH) whereas the other sensors are allocated to the nearer CH. Extensive experimentation portrayed the promising performance of the CSPOC-GFLR technique by achieving reduced energy utilization, improved lifetime, and prolonged stability over the existing techniques.

Keywords: Clustering; routing; wireless sensor networks; energy efficiency; network lifetime; metaheuristics

1 Introduction

The current development in the area of wireless communications, MEMS (microelectromechanical system), and digital electronics have led to the growth of microsensors. This small sensor comprises multifunction, transfer easily on shorter distance, requires lower power, and inexpensive [1]. The sensor nodes are accountable for sensing, processing, and delivering data to the base station (BS). They must operate together to create a wireless sensor network (WSN). A WSN comprises a huge amount of sensor nodes that are manually/arbitrarily placed in a provided coverage area. The nodes collect the local physical data, aggregate, and transmit them to BS named sink. For public notable events, the BS is linked to the internet. Rather than transmitting raw data to the node accountable for data fusion, the sensor node could utilize their functioning capabilities to execute evaluation, and fusion operation is to transfer the required data [2]. This feature of wireless sensor allows utilizing in several fields particularly for monitoring and surveillance.



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Wireless Communication without the Need for Pre-Shared Secrets is Consummate Via the Use of Spread Spectrum Technology.

Y Sucharitha^{1*}, S Vinothkumar², Vikas Rao Vadi³, Shafiqu Abidin⁴, Naveen Kumar⁵, and G Shobanay⁶

Abstract

Researchers describe the utilization of wideband chirp signals in domestic environments for frequency hopping technologies. Chirp transmission and pulse compressing are used in the system principles described. Varied modulating systems for chirp impulses leading to different application performance and complexities are evaluated for AWGN and frequency-dependent inside radio stations, in terms of their bit accuracies. We show similar calculations and measuring findings for the production of the chirp signals using demonstration systems that employ Superficial Auditory Waves (SSAW) sensors. The proposed system is equipped with 2.5 GHz, 358.8 MHz, and 85 MHz of RF and IF frequencies and communication bandwidth. The technology is not susceptible to selected frequency fading, CW interfering and sound owing to a processor increase of 16 dB—enabling its use of SAW devices—as well as the broad communication bandwidth.

Keywords: Wireless communication; Chirp transmission; Superficial Auditory Waves (SSAW)

Introduction

Internal telecommunications has been receiving more and more attention over several years and is expected to a significant increase in its market share over the next few decades, owing to benefits over cable providers, including data movement, wire removal, and flexibility. Principal applications include skilled and flexible data transfer connections among sensors, controllers, robotics, and monitoring systems in commercial processes as well as a wireless, local community network for home-based and workplace applications. The comprehensive communication connection is an incredibly significant element of the WLAN communication network, owing to an unfriendly engineering environment, including harsh electronic emission from other equipment and substantial aberrations caused by multi-path propagation [1].

Even in highly loud radio settings, the spread spectrum technique is ideal for providing such a comprehensive information transmission [2]. Dispersion functions in the transmitter and receiver are the key

processes in spread spectrum devices. The unpleasant program is a hard process in general ideas synchronization, requiring significant calculation effort. Another type of propagation-spectrum approach may be implemented with well FM chirp-signals with related pulse compression techniques and their huge computational gain, extensively utilized in radar systems [3-8]. In this system concept, the propagation is utilized exclusively to counteract multi-way aberrations, while the multiplex access (CDMA) code division can only be achieved by the introduction of extra coding.

The spreading and disperse of chirping impulses may simply be achieved by the use of barked signals of the ground transducer. Small and low-cost systems may be used for these devices and the complicated sync circuitry could be reduced because of the analog correlation method. We discuss several incoherently and coherently modulated methods of chirp spreading spectrum systems after insertion into the theory of chirp signals. Simulations and initial observations are provided with a device demonstration.

Chirp Theory

A chirp frequency is written as

$$\Omega(T) = A(T) \cos[\Theta(T)] \dots \dots \dots (1)$$

where $\Theta(T)$: Phase, and $A(T)$: Chirp signal at 'a' time for length 'T'.

The instantaneous can be stated as:

$$F(T) = (1/2\pi) (d\Theta/dt) \dots \dots \dots (2)$$

The chirp change value is shown as:

$$\mu(T) = (dF/dt) = (1/2\pi) (d^2\Theta/dt^2) \dots \dots \dots (3)$$

Here with $\mu(T) > 0$: Upchirps; $\mu(T) < 0$: Down-chirps.

For a linear chirp $\mu(T)$: constant,

Waveform centered (T) = 0

$$\phi(T) = a(T) \cos [2\pi fT + \pi\mu T^2 + \theta_0] \dots \dots \dots (4)$$

$$B = \mu(T) \dots \dots \dots (5)$$

A matching filter's reaction to a nonlinear chirping input is a chirping signal once more, but it has the chirping rate of the negative polarity. The output signal usually has a low IF pitch in the chirp center frequency when a shaft shape is supplied in its filter circuit [9]. If we look at smooth domain waveform and consider the template matching centered in $t=0$, then an analytical model may be provided for the output voltage $g(t)$ of the filter circuit. We've got

$$G(T) = H(T) * A(T) = \mu(T) \dots \dots \dots (6)$$

Where $\mu(t)$ is the relative function of $A(T)$.

$$\Theta(T) = (Sq.BT) (\sin/\mu BT (1-(t/T)\mu BT) \cos (2\pi FT)) \dots \dots \dots (7)$$

The reference voltage should be specified as $1/B$. Consequently, the moment combination TB defined as both the compressive ratio or processing efficiency is the proportion of the outputs and inputs pulses length. An important parameter is the reject of the rectangular time-frequency A , which is around 14 dB in chirp signals (T). The use

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DTW Algorithm – Dementia Detection For Driving Pattern In Smart Phones

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ABSTRACT ; Dementia is a term that covers a group of symptoms that include memory loss and difficulty, as well as challenges with thinking, problem-solving, and language. Dementia is caused by disorders that break the mind, such as Alzheimer's disease or a series of strokes. There are hundreds of requests available to assist persons who have been diagnosed with dementia. However, there are no apps or multimedia that can tell a person whether or not they have dementia. To recognize dementia, approved approaches include a variety of exams and diagnostic procedures. These dementia tests often include mental ability tests, blood tests, and brain imaging. In this work, an unique technique for detecting dementia is proposed, which involves detecting repeated changes in a person's steering outline using smartphone sensors and the DTW algorithm, as well as prescribing medication before the condition deteriorates if the individual is diagnosed with dementia.

Keywords: Dementia, Alzheimer's, DTW (Dynamic Time warping), accelerometer, magnetometer, gyroscope, SMA (simple moving average).

1. INTRODUCTION

Dementia is a symptom, not a disease. It's a broad word that refers to a slew of symptoms associated with a loss of memory or other thinking skills severe enough to limit a person's ability to carry out daily chores. Due to the wide range of dementia symptoms, at least two of the following core mental functions must be considerably impaired in order to be diagnosed with dementia:

1. Memory
2. Communication and language
3. Ability to focus and wage attention
4. Reasoning and judgment
5. Visual perception

Dementia is caused by damage to brain cells. The ability of mind cells to communicate with one another is harmed as a result of this injury. When brain cells don't interact properly, it might have an impact on one's thoughts, actions, and emotions. There is no single test that



Multi-criteria-based approach for job scheduling in industry 4.0 in smart cities using fuzzy logic

Priyan Malarvizhi Kumar¹ · Gokulnath Chandra Babu² · Anandamurugan Selvaraj³ · Mohsin Raza⁴ · Ashish Kr. Luhach⁵ · Vicente García Díaz⁶

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Abstract

A flexible manufacturing system (FMS) is the model used for the system produced in the manufacturing industry, and it consists of the number of interconnected workstation. Inflexible manufacturing system scheduling of jobs has become a serious problem, even for a short breakdown of the machine and for the unexpected arrival of the product. To overcome this problem, a flexible manufacturing system using fuzzy rules is proposed. In this proposed model, four input variables are considered: (1) machine allocated processing time; (2) priority of the machine; (3) priority of the due date; and (4) priority of the setup time. The priority based on the job is the fuzzy variable, which shows the status of the job, based on which the next job will be selected for the processing in the machine. In this model, the machine will be selected first, and then, the scheduling is done based on the multi-criteria scheduling system. The obtained results are compared with the existing system and from the results. The improved scheduling strategy provides better results for the scheduling problem.

Keywords Fuzzy logic · Fuzzy scheduling · Multi-criteria scheduling · Processing time · Priority

Communicated by Vicente Garcia Diaz.

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1 Introduction

In recent years, wireless sensors have taken an important role in advanced monitoring and measuring sectors. The sensors have turned out to be an essential part of various industries intended to use them in safeguarding and maintaining their assets. The wireless sensors are enabled through data processing along with communication abilities. These tiny devices are useful in the prevention of possible failures in the early stages of safety-critical in industrial and environmental monitoring applications. The wireless sensors are widely used in industrial monitoring: health monitoring of the machinery, industrial asset tracking, and harmful gas leakage detection in industries and environmental monitoring. As the cost of sensors is low, they can be deployed in more numbers in the monitoring area (Saha et al. 2013). This, in turn, poses the challenges in network management like routing, topology control, and data management protocols. The huge counts of SNs (sensor nodes) are randomly deployed to monitor a wide range of geographical space to cover the desired area. These SNs require batteries for their operations, and the life of SN depends on the batteries working condition. Once the batteries dry, battery recharging or installing a

ORIGINAL ARTICLE



Static localization for underwater acoustics sensor networks using Nelder–Mead algorithm for smart cities

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Abstract

Localization is considered as an important research concept for underwater acoustic sensor networks (UASNs). It performs significant role in diverse routing methods, estimating the node position and node recovery. In UASNs, localization methods have different characteristics compared with the terrestrial networks. The challenges involved in UASNs are varying water temperature and pressure, time synchronization of beacon nodes, complicated ocean currents, and positioning of nodes. To overcome these challenges, a virtual node is deployed using the Nelder–Mead algorithm with the static localization method. In this study, two types of localization methods namely static and dynamic methods are considered and a virtual node is deployed in a static localization manner. Since anchor nodes cannot communicate to the entire network for localization additionally, virtual nodes are deployed to measure the received signal strength indicator and error ratio for effective transmission. In addition “GPS node” is equipped with a ship for easy deployment without communication overhead. The simulation result justifies that static localization for an autonomous underwater sensor networks perform

Protecting Data Mobility in Cloud Networks Using Metadata Security

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Abstract: At present, health care applications, government services, and banking applications use big data with cloud storage to process and implement data. Data mobility in cloud environments uses protection protocols and algorithms to secure sensitive user data. Sometimes, data may have highly sensitive information, leading users to consider using big data and cloud processing regardless of whether they are secured are not. Threats to sensitive data in cloud systems produce high risks, and existing security methods do not provide enough security to sensitive user data in cloud and big data environments. At present, several security solutions support cloud systems. Some of them include Hadoop Distributed File System (HDFS) baseline Kerberos security, socket layer-based HDFS security, and hybrid security systems, which have time complexity in providing security interactions. Thus, mobile data security algorithms are necessary in cloud environments to avoid time risks in providing security. In our study, we propose a data mobility and security (DMoS) algorithm to provide security of data mobility in cloud environments. By analyzing metadata, data are classified as secured and open data based on their importance. Secured data are sensitive user data, whereas open data are open to the public. On the basis of data classification, secured data are applied to the DMoS algorithm to achieve high security in HDFS. The proposed approach is compared with the time complexity of three existing algorithms, and results are evaluated.

Keywords: Data mobility; data security; cloud computing; big data; DMoS algorithm

1 Introduction

Big data are processed in cloud storages using the Hadoop file system. However, providing security to big data in cloud databases is challenging. Content delivery networks in cloud environments are used by service providers and numerous content users, who are connected to the system. Thus, sensitive data in



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w | www.kaartech.com

December 05, 2020
Dhivakar Loganathan
Chennai

INTERNSHIP OFFER LETTER

Dear Dhivakar,

With reference to your application and subsequent interview, you had with us, we are happy to offer you internship opportunity in Kaar Technologies India Pvt. Ltd. on the following terms and conditions.

The internship period is for 6 months effective from December 07, 2020 till June 06, 2021. You will be required to attend office 5 days a week between 9.30 a.m. and 6.30 p.m. During your internship period you are eligible for a stipend amount of Rs.10,000/ Payable every month. You will be governed by work guidelines and policies of Kaar for all other matters.


This Internship letter is not a guarantee for employment, post your internship period. You are requested to meet your department head/HR for the continuation of your internship.

During the period of your internship, you are expected to maintain utmost secrecy in regard to the affairs of the company and shall keep confidential any information, instruments, documents, etc., relating to the company that may come to your professional knowledge as an intern of the company

Kindly sign a duplicate copy of the Letter and return it to us at the earliest as a token of acceptance of this offer.

We welcome you to Kaar and look forward for a mutually rewarding association with you.

For Kaar Technologies India Pvt. Ltd.,


Authorized Signatory.

September 9, 2020,

Dear Koushik D,

Congratulations! We are happy to offer you internship at Coda from **September 7, 2020 for three months**. We hope it will be a great learning experience and will provide the right exposure when you start with us full time. During this period, Coda will be happy to provide a stipend of **INR 16,000/month**.

Wishing you all the best and "Do Something Great Every day!"

For Coda Software Solutions Pvt Ltd



Gopinathan Pandurangan (Sep 10, 2020 09:15 GMT+5.5)

Gopinathan Pandurangan

VP Solution Delivery

September 9, 2020,

Dear Naveen kumar Mohanasundaram,

Congratulations! We are happy to offer you internship at Coda from **September 7, 2020 for three months**. We hope it will be a great learning experience and will provide the right exposure when you start with us full time. During this period, Coda will be happy to provide a stipend of **INR 16,000/month**.

Wishing you all the best and "Do Something Great Every day!"

For Coda Software Solutions Pvt Ltd



Gopinathan Pandurangan (Sep 10, 2020 09:15 GMT+5.5)

Gopinathan Pandurangan

VP Solution Delivery

Place: perundurai

Date: 31-12-2020

Permission Letter

From,

G. Janani (ITITR040),

Final year - B.Tech - IT - A,
Kongu Engineering College,
perundurai - 638052

To,

The Head of the Department,
Department of Information Technology,
Kongu Engineering College,
perundurai - 638052

Respected Sir,

Sub: Regd. Internship program

I have got placed in Aalam info solutions during the placement drive conducted on (30-12-20). Aalam offers 3 months full internship for the freshers. As per the mail received from Aalam, my internship starts from January 4th (4-1-21). Due to this, I will not be able to attend my academic classes. So, I request you to permit me

to do my internship for this semester and also consider my absence as on-duty for the internship period. I also request you to consider my internship work as academic project.

HOD to check whether work is enough to be converted into project.

Thanking you,

company has asked her to join physically on 4th of January. So, kindly permit her to join
(M. Parimalan)

yours faithfully,
JSP.
(G. JANANI)

(P.O.O)

31/12/2020

Submitted to the Principal

As she is required to do the internship physically in the Chennai office, she may be permitted to attend the internship.

✓ she is instructed to make use of google meet recordings for the class sessions.

Y 31.12.2020 **Permitted**
W 12.12.20

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Dear Janani,

Congratulations!

We are pleased to offer you the full time position of **"Intern"** with a Stipend of **10,000/Month** based on the outcome of the interviews that you have attended with us. We trust that your knowledge, skills and experience will be amongst our most valuable assets and we are all excited about the potential that you would bring to our company.

On successful and satisfactory completion of your training period of 3 months, you will be confirmed as a employee of the company depending on your performance.

**** TDS applicable as per Govt. Norms**

You will be issued the offer letter on your Date of Joining. You are requested to join us on **4th January 2021.**

If you choose to accept this offer, please sign, scan, and email the letter to **hr@aalamsoft.com** by **31 December 20** and revert back to us in case of any queries.

You are requested to report to the below address on the date of joining at **9.30am**.

Address :No.75, II Floor, M Block, III Avenue, Anna Nagar East, Chennai 600 102, India.

You are requested to submit the following documents while coming for joining formalities (if applicable):

3 colored passport size photographs & 1 stamp size photograph

Address proof: Photocopies of any three of the following (2 copies)

- Passport
- Election id card
- Aadhar Card (Mandatory)
- Driving license
- Pan card (Mandatory)

Originals and Photocopies of your educational certificates:

- 10th mark sheet
- 12th mark sheet
- Degree marks sheet (All year semester marks sheets, consolidated mark sheet, degree certificate)
- PG marks sheet (All year semester marks sheets, consolidated mark sheet, degree certificate)

Photocopies of your other course experience certificates:

Email ids and phone numbers of at least 2 references. Reference email id and phone number – a must from your Training institution and College.

If on verification, at the time of appointment or at a later date it is found that you have furnished wrong information, your services with the company will be liable for termination.

We are all looking forward to having you on our team.

Best regards,
Patricia Diaz
HR Specialist

Date: 25-November-2020

To,
Priyadarshini Gopal

Copy To,
Kongu engineering college, IT
Erode

Sub: Offer of Internship

We would like to congratulate you on being selected for Internship with Soliton Technologies Private Limited. All of us at Soliton are excited that you will be joining our team!

As such, your internship will include training and orientation. The focus will primarily be on learning and developing new skills and gaining a deeper understanding of concepts through hands-on application.

Your internship shall be subject to the following terms and conditions:

Position Title : Intern
Start Date : 1-December-2020
End Date : 31-March-2021
Base Location : Soliton Technologies Pvt. Ltd
305, Third Floor, Tidel Park,
Coimbatore

Conditions of the Agreement:

1. The stipend applicable during the internship period is Rs.10,000/- per month.
2. There will be an additional allowance of Rs.5,000/- per month for outstation Interns towards accommodation. This will be applicable upon relocation and for the duration during which the Intern works from the base location.
3. The total number of working hours shall be 9 hours per day inclusive of lunch break for 1 hour, from Monday to Saturday.
4. You will be eligible for holidays on Sundays and on all declared company holidays.
5. You will receive direct and close supervision by appropriate supervisors.
6. As an intern, you will not receive any of the regular employee benefits that includes, but not limited to health insurance, educational allowance, paid leaves, or social security benefits.
7. An internship completion letter will be issued after the completion of internship, which needs to be submitted to your college.

The Intern agrees to and acknowledges the following:

- Company may at any time at its sole discretion, terminate the internship without notice or cause.

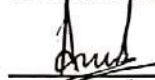
- You will maintain a regular internship schedule determined by the supervisor.
- You will demonstrate honesty, punctuality, courtesy, cooperative attitude, proper health and grooming habits, appropriate dress and a willingness to learn.
- You will adhere to the workplace policy provisions of Soliton Technologies and comply with Soliton business practices and procedures.
- You will furnish your supervisor with all necessary information pertaining to your assignments and reports.
- Under no circumstances will the Intern leave the internship without first conferring with Intern's supervisor.
- Transportation to and from the internship location is your responsibility.

Intellectual Property and confidential Information:

During your internship, you may have access to trade secrets and confidential business information belonging to the Company. By accepting this offer of employment, you acknowledge that you must keep all this information strictly confidential, and refrain from using it for your own purposes or from disclosing it to anyone outside the Company. In addition, you agree that, upon conclusion of your employment, you will immediately return to the Company all its property, equipment, and documents, including electronically stored information.

Please indicate your acceptance of the Internship by signing this letter and return a copy to HR department.

Yours Sincerely



Anu Antony
HR Manager

ACCEPTANCE:

I, Priyadarshini Gopal, hereby acknowledge that the above-mentioned Internship Program, is a learning experience to enhance my continuing education.

Signed in accepted by:



INTERN

Date: 11.03.2021

IT

LS375/1

Permission Letter

21/01/2021,

Perundurai.

From

Sri Hari Harran B (17ITR096),

Final year, B.Tech - IT - B,
 Department of Information Technology,
 Kongu Engineering College,
 Perundurai-638060.

To

The Head of the Department,
 Department of Information Technology,
 Kongu Engineering College,
 Perundurai-638060.

Internship permission
 But online classes to
 be attended / finished up.
 All tests / exams to be
 attended as per schedule.
 21/1/21

Respected Sir,

Sub: Regd. Internship program

I have been selected as Software Engineer - DEVNET in DIGIKRIYA, #33-03, International Plaza, Singapore - 079903. In this regard, I need to join the internship by 18th January 2021 for a period of four months. Due to this, I will not be able to attend my academic classes. So, I request you to permit me to undergo internship for this semester and also consider my absence as on-duty for the internship period. I also request you to consider my internship work as academic project.

Thank You,

Sir,

Yours Faithfully,
 Sriharan

A. S. S. S.
 (Class Advisor)

The above Company
 "DIGIKRIYA" had a cubical in
 our TBI. Student will do
 The Internship in our TBI
 only. May be permitted

May kindly be permitted.

R. S. S. S. ✓ 21.01.2021
 Head/IT

P. S. S. S.
 (Project Coordinator)

CAT Exam is
 will be attended
 by the student
 as per schedule
 R. S. S. S.
 (Test Co-ordinator)

S. S. S. S.
 21/01/21
 (M. Ramalingam)

Appointment Letter

Date: Jan 10, 2021

Mr. Srihariharan.B

56, Madhava Krishna Street,
Erode 638001,
Tamilnadu,
INDIA.

Email : srihariharanb@gmail.com

Dear Srihariharan,

Sub: Student Internship & Employment Offer

DIGIKRIYA is pleased to extend an offer you for a Student Internship position within our DEVNET Department. The Position is for STUDENT INTERN for a period of 4 months based in Perundurai, Tamil Nadu India 638052, effective **Jan 11, 2021**

You will be paid a fixed stipend of **INR 25,000 (TWENTY-FIVE THOUSAND Indian Rupees)** for your 4-month internship.

Further to fulfilling your University requirements and Subject to successful completion of your current Bachelor's Degree Course and Student Internship program, DIGIKRIYA wishes to further extend offer of employment of **SOFTWARE ENGINEER – DEVNET** Position, effective **May 11, 2021** as per the terms and conditions specified below.

- a) You will be placed within the salary range of **INR 1.8Lakhs to INR 2.5 Lakhs Annualized Salary (Indian Rupees Only)** at the discretion of company based on your performance during student Internship. The exact breakup of the salary will be confirmed after your Student Internship more fully described in the updated employment offer letter.
- b) You will be entitled for **INR 20,000** as joining bonus which will be paid along with May 2022 salary upon completion of **12months** from the date of joining. The joining bonus will automatically void if you are not on the payrolls of the company effective May 01, 2022.
- c) In addition, you will be eligible to be considered for an incentive bonus for each fiscal year of the Company. The bonus (if any) will be awarded based on your Individual Performance and Company financial performance overall objective or subjective criteria established by the Company's Chief Executive Officer Your target bonus will be up to **15% of your annual salary**. Any bonus for the fiscal year in which your employment begins will be prorated, based on the number of days you are employed by the Company during that fiscal year. Any bonus for a fiscal year will be paid in December after the close of that calendar year, but only if you are still employed by the Company at the time of payment. The determinations of Company Management with respect to your bonus will be final and binding.

Date: Jan, 10 2021



KONGU ENGINEERING COLLEGE

(Autonomous)

THOPPUPALAYAM (PO) PERUNDURAI - 638 060 ERODE (Dt)

TAMILNADU INDIA

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)



21st January 2021

Dr.R. Thangarajan

Professor & Head / Department of Information Technology

E-mail: hod_it@kongu.ac.in, rt.cse@kongu.edu

Phone: 04294 - 226570(Off.), +91-9443014942

To

Dr Norshakirah A Aziz

Assistant Professor, Department of Information Technology

Universiti Teknologi, Petronas.

SUBJECT: NOMINATION

Dear Prof. Dr Norshakirah A Aziz

I am writing to request internship placement of my student to Universiti Teknologi, PETRONAS, IN SPECIFIC UNDER YOUR SUPERVISION. The conditions are as follows:

1. Student Name : Bhuvaneswari M
2. Time Period : 8 weeks
3. Start Date : January 2021
4. Research subject: Data Quality and Pre-processing for Cluster 1 of Corrosion Groups
5. Internal Supervisor from KEC: Dr.C.Nalini/ Professor

If you have any inquiry or need further information about this request, please feel free to email me at rt.cse@kongu.edu. I am looking forward to receive your positive reply soon.

Thank you.

With kind regards,

(Dr.R.Thangarajan)

Dr. R.THANGARAJAN

PROFESSOR AND HEAD

DEPT. OF INFORMATION TECHNOLOGY

KONGU ENGINEERING COLLEGE

THOPPUPALAYAM (Po)

PERUNDURAI (TK), ERODE - 638 080.

CERTIFICATE

of Completion

This is to certify that

BHUVANESWARI .M

from

KONGU ENGINEERING COLLEGE, INDIA

has successfully completed

Virtual Research Attachment Program

from 20 January 2021 to 19 March 2021

at

Universiti Teknologi PETRONAS

Topic:

Data Quality and Pre-processing for Cluster 1 of Corrosion Groups

Shahiraah Binti

Ts. Dr. Norshahirah Binti Ab Aziz

Supervisor

Computer & Information Sciences

Universiti Teknologi PETRONAS

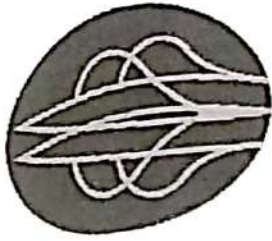
Nurhidia Bt Mansor

Assoc. Prof. Dr. Nurhidia Bt Mansor

Senior Director

Centre for Student Development

Universiti Teknologi PETRONAS



UNIVERSITI
TEKNOLOGI
PETRONAS



June 21, 2021

To: Janani C K

Congratulations **Janani**! We are happy to welcome you to Grootan Technologies and we are pleased to offer you the role of **Junior Engineer**.

With reference to the same, mentioned below are the details of your joining the company:

- 1. Internship Start Date: August 02,2021**
- 2. Stipend:10K Per Month (During Internship Period)**
- 3. Location: Grootan Technologies Pvt Ltd, #364 & 365, Vaibogh,5th Link Street
Nehru Nagar, Perungudi-600096**

Your role carries a total annual compensation and benefits of INR **5,00,004** (refer to the breakup of salary components). Below package will be applicable once you join the company full time.

Salary Break-Up	Per Month	Per Annum
Basic	16,667	200,004
House Rent Allowance	10,000	120,000
Conveyance Allowance	1000	12,000
Professional Dev Allowance	2,500	30,000
Performance Allowance	7,500	90,000
Attire Allowance	1,000	12,000
Business Communication	1,000	12,000
Medical Reimbursement	2,000	24,000
Gross Salary	41,667	500,004

Please keep the salary information confidential. As a token of acceptance, please sign a copy of this document and email to hr@grootan.com within three days of receiving this letter else this offer will be deemed to be cancelled.

Wishing you all the best and let's "Grow together" !

Thanks,

Lokesh Ravichandru
Co-Founder & CTO

Sasikumar T
Director of Project Delivery & HR



MAERSK

Dear Karthick M,

Date: 17 May 2021

We are pleased to confirm your Internship with Maersk Global Service Centers (India) Pvt. Limited (hereinafter referred as "Company") on the following terms and conditions with effect from **31 May 2021** for a period of six months. Accordingly, your internship will come to an end on **30 November 2021**.

1. **Scope:** You will perform internship in **Maersk Platform on Access Management & KYC** and such other scope of work as intimated by the Company from time to time.
2. **Location:** Your location for Internship with the Company will be **Bangalore**.
3. **Intern Mentor:** An employee from **Harsha Alakeshwar's** team will act as your 'Mentor' during the tenure of your internship with the Company and will supervise all aspects of your internship. If for any reason, the assigned Mentor is unable to continue to serve as your Mentor, the Company shall appoint another person as the Mentor under whose aegis you shall continue your internship. Your assignment and schedule would be as per the discussions with your Mentor.
4. **Business hours:** Unless otherwise agreed upon, the working hours during your internship would be from 9:30 a.m. to 6:30 p.m. from Monday to Friday.
5. **Review meetings:** The Intern Mentor along with such other individuals as deemed appropriate by the Company may conduct periodic review meetings (as needed) with you to discuss on progress of various parameters agreed upon, assessment of milestones as well as any issues arising from your internship.
6. On completion of your internship you will be required to submit the project report (if applicable) to your Mentor and the HR team, basis which the Company will issue the internship completion certificate.
7. You will perform your assignments in an independent capacity, and nothing in this offer/ Agreement shall be construed to give you the power or authority to act for, bind, or commit on behalf of the Company in any way. Nothing herein shall be construed to create the relationship of partners, employer and employee, or principal and agent.
8. **Stipend:** In consideration of your performance during the internship, the Company agrees to pay a fixed sum of **INR 40,000** per month as Stipend with effect from the Effective Date, subject to deduction of applicable taxes. The above sum represents the entire compensation for your internship with the Company for the tenure agreed upon.

MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

Ground Floor, Block 1, Milestone Buildcon SEZ, Bhartiya City
Thanisandra Main Road, Chokanahalli, Bangalore- 560064

Regd. Office : 4th & 5th Floor, Prudential Building, Central Avenue Road, Hiranandani Business Park, Powai,
Mumbai - 400 076. India. Phone : 91-22-6679 9999 Fax : 91-22-6679 9030/40 - www.maerskline.com

Corporate Identity Number (CIN) : U72900MH2003PTC143195



MAERSK

9. By virtue of your internship with the Company, you shall not be entitled for default extension of your internship for any further period, or for any permanent employment with the Company. You shall not be entitled for or participate in Company's benefit plans, schemes or programs.
10. **Confidentiality:** Close cooperation between you and the Company may require disclosure of certain confidential information by the Company to you. You shall not under any circumstances, unless authorized in writing by the Company, (i) make or attempt to make any copy of the Confidential Information provided to you for any purpose other than for inclusion in the scope defined for your internship, (ii) transfer any copy to a person, company or agency outside of the Company, or (iii) retain any such copy beyond the term of your internship or use the same for your benefit.
11. **Intellectual Property Ownership:** The Company shall remain for all purposes hereunder the sole and exclusive owner of all right, title, and interest in and to its intellectual property. The Intern acknowledges that it acquires no rights under this internship on the Company's intellectual property. The Intern hereby assigns to the Company, without additional compensation, all of such technology/ material and associated Intellectual Property Rights to the research and any work generated hereunder whether jointly with the Company or otherwise. All such inventions and discoveries, whether patentable or otherwise protectable, that have been requested, accepted, created for, or paid for by the Company shall, subject to any third-party materials contained therein, be considered the sole property of the Company. The Intern shall execute all documents and perform all acts deemed necessary by the Company to assign to the Company, title in the work. To the fullest extent permitted by applicable law, all such materials/ Research that are subject to copyright protection shall be deemed works made for hire. To the extent that title to any materials/ Research may not, by operation of law, vest with the Company or to the extent that such materials/ Research may not be considered works made for hire, the Intern hereby irrevocably assigns to the Company all right, title, and interest in and to any materials/ Research.
12. All information/material or other Company assets, which you have access to during the tenure of your internship, is the sole property of the Company. On completion of your internship; you will return documents, IT assets, equipment, and all other property in your possession with the Company.
13. **Termination:** a) Basis your performance evaluation in the review meetings (Article 5 above) or for any breach of terms hereunder, the Company reserves the right to terminate your internship with immediate effect.; b) Either the Company or You may terminate the internship by giving the other party 15 days' prior notice.
14. You must strictly abide by the 'IT security policy, Email and Internet policy', 'Data Privacy Policy', 'Code of conduct', 'Commit rules' and other applicable policy issued by the Company.

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Corporate Identity Number (CIN) : U72900MH2003PTC143195



MAERSK

You are kindly requested to confirm your agreement to the above terms and conditions, by signing and returning the duplicate of this Letter.

We welcome you to our organization and trust that your association with us will be a happy and mutually rewarding one!

Yours faithfully,
For MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

Gautam Shetty
India Hiring Lead

Agree

Date 18.05.2021

KARTHICK M

MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

Ground Floor, Block 1, Milestone Buildcon SEZ, Bhartiya City
Thanisandra Main Road, Chokanahalli, Bangalore- 560064

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Corporate Identity Number (CIN) : U72900MH2003PTC143195

Classification: Confidential



Dear Giridharan P,

Date: 17 May 2021

We are pleased to confirm your Internship with Maersk Global Service Centers (India) Pvt. Limited (hereinafter referred as "Company") on the following terms and conditions with effect from **31 May 2021** for a period of six months. Accordingly, your internship will come to an end on **30 November 2021**.

1. **Scope:** You will perform internship in **GCD/Customs Compliance on Development & Testing**, and such other scope of work as intimated by the Company from time to time.
2. **Location:** Your location for Internship with the Company will be **Bangalore**.
3. **Intern Mentor:** An employee from **Avinash Seetharamu's** team will act as your 'Mentor' during the tenure of your internship with the Company and will supervise all aspects of your internship. If for any reason, the assigned Mentor is unable to continue to serve as your Mentor, the Company shall appoint another person as the Mentor under whose aegis you shall continue your internship. Your assignment and schedule would be as per the discussions with your Mentor.
4. **Business hours:** Unless otherwise agreed upon, the working hours during your internship would be from 9:30 a.m. to 6:30 p.m. from Monday to Friday.
5. **Review meetings:** The Intern Mentor along with such other individuals as deemed appropriate by the Company may conduct periodic review meetings (as needed) with you to discuss on progress of various parameters agreed upon, assessment of milestones as well as any issues arising from your internship.
6. On completion of your internship you will be required to submit the project report (if applicable) to your Mentor and the HR team, basis which the Company will issue the internship completion certificate.
7. You will perform your assignments in an independent capacity, and nothing in this offer/Agreement shall be construed to give you the power or authority to act for, bind, or commit on behalf of the Company in any way. Nothing herein shall be construed to create the relationship of partners, employer and employee, or principal and agent.
8. **Stipend:** In consideration of your performance during the internship, the Company agrees to pay a fixed sum of **INR 40,000** per month as Stipend with effect from the Effective Date, subject to deduction of applicable taxes. The above sum represents the entire compensation for your internship with the Company for the tenure agreed upon.

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P. Giridharan.



MAERSK

9. By virtue of your internship with the Company, you shall not be entitled for default extension of your internship for any further period, or for any permanent employment with the Company. You shall not be entitled for or participate in Company's benefit plans, schemes or programs.
10. **Confidentiality:** Close cooperation between you and the Company may require disclosure of certain confidential information by the Company to you. You shall not under any circumstances, unless authorized in writing by the Company, (i) make or attempt to make any copy of the Confidential Information provided to you for any purpose other than for inclusion in the scope defined for your internship, (ii) transfer any copy to a person, company or agency outside of the Company, or (iii) retain any such copy beyond the term of your internship or use the same for your benefit.
11. **Intellectual Property Ownership:** The Company shall remain for all purposes hereunder the sole and exclusive owner of all right, title, and interest in and to its intellectual property. The Intern acknowledges that it acquires no rights under this internship on the Company's intellectual property. The Intern hereby assigns to the Company, without additional compensation, all of such technology/ material and associated Intellectual Property Rights to the research and any work generated hereunder whether jointly with the Company or otherwise. All such inventions and discoveries, whether patentable or otherwise protectable, that have been requested, accepted, created for, or paid for by the Company shall, subject to any third-party materials contained therein, be considered the sole property of the Company. The Intern shall execute all documents and perform all acts deemed necessary by the Company to assign to the Company, title in the work. To the fullest extent permitted by applicable law, all such materials/ Research that are subject to copyright protection shall be deemed works made for hire. To the extent that title to any materials/ Research may not, by operation of law, vest with the Company or to the extent that such materials/ Research may not be considered works made for hire, the Intern hereby irrevocably assigns to the Company all right, title, and interest in and to any materials/ Research.
12. All information/material or other Company assets, which you have access to during the tenure of your internship, is the sole property of the Company. On completion of your internship; you will return documents, IT assets, equipment, and all other property in your possession with the Company.
13. **Termination:** a) Basis your performance evaluation in the review meetings (Article 5 above) or for any breach of terms hereunder, the Company reserves the right to terminate your internship with immediate effect.; b) Either the Company or You may terminate the internship by giving the other party 15 days' prior notice.
14. You must strictly abide by the 'IT security policy, Email and Internet policy', 'Data Privacy Policy', 'Code of conduct', 'Commit rules' and other applicable policy issued by the Company.

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You are kindly requested to confirm your agreement to the above terms and conditions, by signing and returning the duplicate of this Letter.

We welcome you to our organization and trust that your association with us will be a happy and mutually rewarding one!

Yours faithfully,
For MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

A handwritten signature in blue ink, appearing to read "Gautam Shetty".

Gautam Shetty
India Hiring Lead

Agree P. Giridharan

Date 18/05/2021

GIRIDHARAN P

MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

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Corporate Identity Number (CIN) : U72900MH2003PTC143195



June 21, 2021

To: Uthaya Sankar N

Congratulations **Uthaya Sankar**! We are happy to welcome you to Grootan Technologies and we are pleased to offer you the role of **Junior Engineer**.

With reference to the same, mentioned below are the details of your joining the company:

- 1. Internship Start Date: August 02,2021**
- 2. Stipend:10K Per Month (During Internship Period)**
- 3. Location: Grootan Technologies Pvt Ltd, #364 & 365, Vaibogh,5th Link Street Nehru Nagar, Perungudi-600096**

Your role carries a total annual compensation and benefits of INR **5,00,004** (refer to the breakup of salary components). Below package will be applicable once you join the company full time.

Salary Break-Up	Per Month	Per Annum
Basic	16,667	200,004
House Rent Allowance	10,000	120,000
Conveyance Allowance	1000	12,000
Professional Dev Allowance	2,500	30,000
Performance Allowance	7,500	90,000
Attire Allowance	1,000	12,000
Business Communication	1,000	12,000
Medical Reimbursement	2,000	24,000
Gross Salary	41,667	500,004

Please keep the salary information confidential. As a token of acceptance, please sign a copy of this document and email to hr@grootan.com within three days of receiving this letter else this offer will be deemed to be cancelled.

Wishing you all the best and let's "Grow together" !

Thanks,

Lokesh Ravichandru
Co-Founder & CTO

Sasikumar T
Director of Project Delivery & HR



MAERSK

Dear Vishva Bharathi C,

Date: 03 November 2021

We are pleased to confirm your Internship with Maersk Global Service Centers (India) Pvt. Limited (hereinafter referred as "Company") on the following terms and conditions with effect from **24 November 2021** for a period of six months. Accordingly, your internship will come to an end on **24 June, 2022**.

1. **Scope:** You will perform internship in **Service Operations on Developing Scripts** and such other scope of work as intimated by the Company from time to time.
2. **Location:** Your location for Internship with the Company will be **Pune**.
3. **Intern Mentor:** An employee from **Wilson Michael Fernandes** team will act as your 'Mentor' during the tenure of your internship with the Company and will supervise all aspects of your internship. If for any reason, the assigned Mentor is unable to continue to serve as your Mentor, the Company shall appoint another person as the Mentor under whose aegis you shall continue your internship. Your assignment and schedule would be as per the discussions with your Mentor.
4. **Business hours:** Unless otherwise agreed upon, the working hours during your internship would be from 9:30 a.m. to 6:30 p.m. from Monday to Friday.
5. **Review meetings:** The Intern Mentor along with such other individuals as deemed appropriate by the Company may conduct periodic review meetings (as needed) with you to discuss on progress of various parameters agreed upon, assessment of milestones as well as any issues arising from your internship.
6. On completion of your internship you will be required to submit the project report (if applicable) to your Mentor and the HR team, basis which the Company will issue the internship completion certificate.
7. You will perform your assignments in an independent capacity, and nothing in this offer/ Agreement shall be construed to give you the power or authority to act for, bind, or commit on behalf of the Company in any way. Nothing herein shall be construed to create the relationship of partners, employer and employee, or principal and agent.
8. **Stipend:** In consideration of your performance during the internship, the Company agrees to pay a fixed sum of **INR 40,000** per month as Stipend with effect from the Effective Date, subject to deduction of applicable taxes. The above sum represents the entire compensation for your internship with the Company for the tenure agreed upon.

MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

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Classification: Confidential



MAERSK

9. By virtue of your internship with the Company, you shall not be entitled for default extension of your internship for any further period, or for any permanent employment with the Company. You shall not be entitled for or participate in Company's benefit plans, schemes or programs.
10. **Confidentiality:** Close cooperation between you and the Company may require disclosure of certain confidential information by the Company to you. You shall not under any circumstances, unless authorized in writing by the Company, (i) make or attempt to make any copy of the Confidential Information provided to you for any purpose other than for inclusion in the scope defined for your internship, (ii) transfer any copy to a person, company or agency outside of the Company, or (iii) retain any such copy beyond the term of your internship or use the same for your benefit.
11. **Intellectual Property Ownership:** The Company shall remain for all purposes hereunder the sole and exclusive owner of all right, title, and interest in and to its intellectual property. The Intern acknowledges that it acquires no rights under this internship on the Company's intellectual property. The Intern hereby assigns to the Company, without additional compensation, all of such technology/ material and associated Intellectual Property Rights to the research and any work generated hereunder whether jointly with the Company or otherwise. All such inventions and discoveries, whether patentable or otherwise protectable, that have been requested, accepted, created for, or paid for by the Company shall, subject to any third-party materials contained therein, be considered the sole property of the Company. The Intern shall execute all documents and perform all acts deemed necessary by the Company to assign to the Company, title in the work. To the fullest extent permitted by applicable law, all such materials/ Research that are subject to copyright protection shall be deemed works made for hire. To the extent that title to any materials/ Research may not, by operation of law, vest with the Company or to the extent that such materials/ Research may not be considered works made for hire, the Intern hereby irrevocably assigns to the Company all right, title, and interest in and to any materials/ Research.
12. All information/material or other Company assets, which you have access to during the tenure of your internship, is the sole property of the Company. On completion of your internship; you will return documents, IT assets, equipment, and all other property in your possession with the Company.
13. **Termination:** a) Basis your performance evaluation in the review meetings (Article 5 above) or for any breach of terms hereunder, the Company reserves the right to terminate your internship with immediate effect.; b) Either the Company or You may terminate the internship by giving the other party 15 days' prior notice.
14. You must strictly abide by the 'IT security policy, Email and Internet policy', 'Data Privacy Policy', 'Code of conduct', 'Commit rules' and other applicable policy issued by the Company.

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MAERSK

You are kindly requested to confirm your agreement to the above terms and conditions, by signing and returning the duplicate of this Letter.

We welcome you to our organization and trust that your association with us will be a happy and mutually rewarding one!

Yours faithfully,
For MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

Gautam Shetty
India Hiring Lead

Agree 

Vishva Bharathi C

Date 06/11/2021

MAERSK GLOBAL SERVICE CENTRES (INDIA) PVT LTD

Ground Floor, Block 1, Milestone Buildcon SEZ, Bhartiya City
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Corporate Identity Number (CIN) : U72900MH2003PTC143195



PAAVAI ENGINEERING COLLEGE

(Autonomous Institution)

(Approved by AICTE and Affiliated to Anna University)

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Paavai Nagar, NH - 7, PACHAL, NAMAKKAL - 637 018. Tamil Nadu

☎ 04286-243038, 58,88 & 98 Fax: 04286-243068 Email: pecprincipal@paavai.edu.in website: <http://pec.paavai.edu.in>

Date: 26.06.2020

To whomsoever it may concern

We are very grateful to **Dr.P.Suresh**, Associate Professor, Department of Information Technology, Kongu Engineering College, Erode for his wonderful contribution as Resource Speaker for the Webinar on "**Data Science using Python**" conducted on 26th June 2020 organized by the Department of Computer Science and Engineering.

We hope that his support and cooperation is solicited in future.



PRINCIPAL
PRINCIPAL

PAAVAI ENGINEERING COLLEGE
NH-7 PACHAL Post, NAMAKKAL Dis'



WAVOO WAJEEHA WOMEN'S COLLEGE OF ARTS AND SCIENCE

(Run by : Wavoo SAR Educational Trust)

(Affiliated to Manonmaniam Sundaranar University)

Tiruchendur Road, Kayalpatnam-628 204, Thoothukudi Dist.

Phone : 04639-285900 Office : 04639-280900, Mobile : 99442 77939

E-mail : wavoo_college@yahoo.co.in

Dr. Mrs. R.C.VASUKI, M.A., Ph.D., DGT
Principal.

Date: 03.07.2020

To whomsoever it may concern

We are very grateful to **Dr.P.Suresh,** Associate Professor, Department of Information Technology, Kongu Engineering College, Erode for his wonderful contribution as Resource Speaker with the topic "**Data Manipulation and Visualization using Python**" on 02.07.2020 in the Online Faculty Development Programme on "**Crash Course to Build Neural Network from scratch using Python**" held from 29 June 2020 to 03 July 2020 organized by the Department of Computer Science and Information Technology.

We hope that this support and cooperation is solicited in future.

With regards,

R. C. Vasuki

PRINCIPAL

WAVOO WAJEEHA WOMEN'S COLLEGE
OF ARTS & SCIENCE

Tiruchendur Road, Kayalpatnam-628 204



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www.sairamit.edu.in



DEPARTMENT OF
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in Association with
COMPUTER SOCIETY OF INDIA



Certificate of Appreciation

This is to certify that Mr. / Ms. / Dr. **R. Devi Priya**
of **Kongu Engineering College** has presented a lecture on
the topic "**Machine learning using python with Real time Examples**"
on **6/8/2020** in the AICTE sponsored Six days
Virtual Short Term Training Programme (STTP) on "**Predictive Modeling and Data Analysis using
Python Based Machine Learning Technique**" held from 03/08/2020 to 08/08/2020 (Phase I)

Dr. B. Sreedevi
HOD/CSE
STTP COordinator

Dr. K. Palanikumar
Principal

Sai Prakash LeoMuthu
Chairman & CEO,
Sairam Institutions





VELALAR

COLLEGE OF ENGINEERING AND TECHNOLOGY

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Affiliated to Anna University, Chennai and Accredited by NAAC with 'A' Grade

Dr. M. JAYARAMAN ME, PhD, FIE
Principal

Ref. No.:VCET/ATAL-FDP/IT/ 152 /2020-21

07.09.2020

To

Dr. R. Devi Priya,
Associate Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai.

Dear Madam,

Sub: Letter of Appreciation for acted as **Resource Person in AICTE ATAL FDP-Reg.**

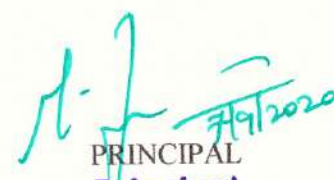
Greetings from Velalar College of Engineering and Technology!

I would like to take this opportunity to express my heartfelt thanks to you for your very active participation as a resource person in our AICTE Training and Learning sponsored Faculty Development Program on "Artificial Intelligence" during 24th to 28th August 2020.

The presentation on 24.08.2020 titled "Adversarial Search and Constraint Satisfaction Problems" to faculty members triggered an upsurge in all our spirits. Your sparkling viewpoints and your motivating words helped to fresh up the minds of all the participants. We hope to get a chance to you in the future also.

Thanking You




PRINCIPAL
Principal
Velalar College of Engineering and Technology.
Erode - 638 012.



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Affiliated to Anna University, Chennai and Accredited by NAAC with 'A' Grade

Dr. M. JAYARAMAN ME, PhD, FIE
Principal

Ref. No.: VCET/ATAL-FDP / IT / 96 /2020-21

20.08.2020

To

Dr. K. Lalitha,

Assistant Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai.

Dear Madam,

Sub: Request to deliver the lecture in ATAL sponsored Five-day FDP on
"Artificial Intelligence", - reg.,

We are happy to inform you that our Department has sanctioned AICTE ATAL FDP, in the thrust area of "Artificial Intelligence" from 24 to 28 August. In this regard, I wish to invite you to deliver an informative talk on the topic "Search Algorithms: Uninformed Search and Informed Search Strategies" on 24.08.2020 forenoon session (11.30 am to 01.00 pm).

Your expertise and experience in your field will be a great contribution to this program and it will highly benefit the participants. We do very much hope that you will be to accept this invitation.

Thanking you,



PRINCIPAL

Principal

Velalar College of Engineering and Technology
Erode - 638 012.



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(Autonomous)



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Thindal, Erode – 638012, Tamilnadu, India

DEPARTMENT OF INFORMATION TECHNOLOGY
(Accredited by NBA)

ATAL Online Faculty Development Program (FDP) on
“ARTIFICIAL INTELLIGENCE”

RECEIPT DETAILS

RESOURCE PERSON NAME : Dr. R. Thangarajan
DESIGNATION : Professor and Head/ IT
COLLEGE NAME : Kongu Engineering College, Perundurai,
WHATSAPP MOBILE NO. : 94430-14942
E-MAIL ID : rt.cse@kongu.edu
DATE, SESSION & TOPIC : 27.08.2020 @ 9:30 AM to 11:00 AM
Introduction to Neural Networks and RNN

ATAL



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www.sairamit.edu.in



**DEPARTMENT OF
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ENGINEERING**



in Association with **COMPUTER SOCIETY OF INDIA**

Certificate of Appreciation

Dr. DEVI PRIYA R

This is to certify that Mr. / Ms. / Dr.
of **KONGU ENGINEERING COLLEGE** has presented a lecture on
the topic "**Data Analytics using R**"

....." on **08.09.2020** in the AICTE sponsored Six days
Virtual Short Term Training Programme (STTP) on "**Predictive Modeling and Data Analysis using
Python Based Machine Learning Technique**" held from 07/09/2020 to 12/09/2020 (Phase II)

Dr. B. Sreedevi
HOD/CSE

Dr. K. Palanikumar
Professor & Principal
Co-ordinator

Sai Prakash LeoMuthu
Chairman & CEO,
Sairam Institutions



CERTIFICATE OF APRECIATION



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PROUDLY PRESENTED TO

DR.R.DEVI PRIYA

*ASSOCIATE PROFESSOR, KONGU ENGINEERING COLLEGE,
ERODE, TAMIL NADU.*

acted as **Resource Person** and delivered the talk on

***The Art of Structuring Paper
for Publishing in Quality Journals***

in the **First International Conference on Advancement in
Management, Engineering and Technology (IC-AMET Online)**
in collaboration with
International Research Journal on Advanced Science Hub (IRJASH)
10th and 11th October 2020

**Editor in Chief
Dr.R.Ranjith
(RSP Conference Hub)**
📍 Coimbatore, Tamilnadu, India

RSP Conference Hub
10, Vaiyapuri Nagar,
Vazhiyampalyam, Coimbatore



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(Affiliated to VTU, Belagavi, Approved By AICTE, New Delhi,
Recognized by UGC with 2(f) & 12(B) Status
Accredited By NBA and NAAC)

Certificate of Appreciation

This is to certify that Dr./Mr./Ms. **Dr. M. Thangamani** has delivered lecture as resource speaker for the topic **Ontology & Automation** in the AICTE Sponsored six days Short Term Training Programme on “Research Challenges and Emerging Trends in Ontology and Data Science for Deep Learning”, jointly organized by AICTE & Department of Information Science and Engineering, MVJ College of Engineering, Bangalore from 12th October to 17th October 2020.



Dr. P Mahabaleswarappa
Principal, MVJCE.



MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408. Namakkal Dt., Tamil Nadu.

Date: 06.11.2020

Greetings from Muthayammal Engineering College, Rasipuram. The Department of Computer Science has organized two days Workshop titled "Code Yourself- Introduction to Project Development" on 05th November & 06th November 2020. Dr. M. Thangamani, Associate Professor, Department of Computer Technology – UG, Kongu Engineering College, Perundurai, Erode has handled the topic "Data Analytics using WEKA, Hadoop Map Reduce Processing". The Sessions was very useful to the participants. Thank you for making the session successful, and we appreciate your continued support.

Thanking You,


HOD/CSE

DR. G. KAVITHA
Head of the Department
Department of Computer Science and Engineering
Muthayammal Engineering College
RASIPURAM - 637 408.



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Website : www.vilms.ac.in email id : mbapincipal@gmail.com


VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

Dr.V.Mohanasundaram., MBA.,M.Phil.,Ph.D
Director/VIIMS

09th Nov,2020

APPRECIATION LETTER

This is to certify that **Dr. R. Rajadevi**, Assistant Professor (SLG), Department of Information Technology, Kongu Engineering College, Erode has acted as a resource person for the Webinar on "**Big Data Analytics Frameworks and Applications**" on 9th November 2020. We appreciate her effective lecture and interaction with participants.

✓ 
DIRECTOR
DIRECTOR,
Vivekanandha Institute of Information
and Management Studies,
Elayampalayam P.O., Tiruchengode Tk
Namakkal Dt, Tamil Nadu - 637 205



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Website : www.vilms.ac.in email id : mbapincipal@gmail.com


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EDUCATIONAL INSTITUTIONS

Dr.V.Mohanasundaram., MBA.,M.Phil.,Ph.D
Director/VIIMS

09th Nov,2020

APPRECIATION LETTER

This is to certify that **Mr.A.P.Ponselvakumar**, Assistant Professor (SRG), Department of Information Technology, Kongu Engineering College, Erode has acted as a resource person for the Webinar on "Twitter Data Analysis" on 9th November 2020. We appreciate his wonderful session and interaction with our students.


DIRECTOR
DIRECTOR,
Vivekanandha Institute of Information
and Management Studies,
Elayampalayam P.O., Tiruchengode Ta
Namakkal Dt, Tamil Nadu - 637 205

NALVINAI Energy Systems

TBI, Kongu Engineering College,
Perundurai, Erode Dist., Tamil Nadu – 638060
nalvinaies@gmail.com

Date: 31-03-2021

To

Dr T. Abirami,

Associate Professor,
Department of Information Technology,
Kongu Engineering College.

We would like to thank you for having accepted our invitation to give a valuable lecture on the topic of “**Machine Learning Techniques and its Industrial application**”, on 13-11-2020 and 14-11-2020.

It was an enlightening session. We thank you for your service and look forward to your valuable support for the growth our company.



Vaithilingam K.

Vaithilingam K

Managing Director

NALVINAI Energy Systems

TBI, Kongu Engineering College,
Perundurai, Erode Dist., Tamil Nadu – 638060
nalvinaies@gmail.com

Date: 31-03-2021

To

Dr T. Abirami,
Associate Professor,
Department of Information Technology,
Kongu Engineering College.

We would like to thank you for having accepted our invitation to give a valuable lecture on the topic of "**Data Structure**", on 05-02-2021.

It was an enlightening session. We thank you for your service and look forward to your valuable support for the growth our company.



Vaithilingam K

Vaithilingam K
Managing Director



Muthayammal Engineering College-Information Technology-Thanks for National Seminar-Reg



Dr.E.M.Roopadevi

Fri 12/24/2021 10:43 AM



To: Chandrasekar L.

E.M.Roopadevi,
Assistant Professor,
Department of IT,
Kongu Engineering College,
Ph.No : 7358056979

Thanks!

Ok.

Cool!

☐ Are the suggestions above helpful? Yes No

Reply

Forward

From: Hod IT <hod.it@mec.edu.in>

Sent: Friday, December 4, 2020 11:14 AM

To: Dr.E.M.Roopadevi <roopadevi@kongu.ac.in>

Subject: Muthayammal Engineering College-Information Technology-Thanks for National Seminar-Reg

Respected Madam,

Warm Greetings,

Very thankful for your esteemed presence at the National Seminar on **“Modern Web Application Development with Apache Struts 2”** on **1st December 2020**. We were glad to hear the Interesting and Informative session from you for the Students as well as the faculty fraternity. We will be delighted for your another session in our Institution, if it happens so. Let us hope our endeavour continues in future.

Thank You

On Mon, Nov 30, 2020 at 10:35 AM Hod IT <hod.it@mec.edu.in> wrote:
Respected Sir/Madam,

Warm Greetings from Muthayammal Engineering College,

Department of Information Technology is Organizing National Seminar on **“Modern Web Application Development with Apache Struts 2”** on **1st December 2020**. we privileged to invite **Dr.E.M.Roopadevi, Associate Professor , Department of Information Technology** as the resource person for the session(**2.30 PM to 3.30 PM**).Kindly accept the Invitation and Depute Dr.E.M.Roopadevi as a resource Person to make this program a Valuable and Informative to the Students.

Thanking you

With Regards,

Dr.E.PUNARSELVAM,
Professor & Head,



Arasu Engineering College

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Chennai Main Road, Kumbakonam - 612 501, Tamil Nadu.
Phone : (0436) 2777 777 - 82



E-mail : arasuengg@aec.org.in arasuengg@gmail.com website: www.aec.org.in

Dr. T. Bala Murugan, M.E., Ph.D.,
Principal

December 4, 2020

LETTER OF APPRECIATION

It is a great pleasure to record our sincere thanks to **Dr. R. Devi Priya,** Associate Professor, Department of Information Technology, **Kongu Engineering College,** Erode, for sparing her valuable time to deliver a special lecture in the One day Workshop on "Machine Learning using R" held on 03.12.2020, organized by the Department of Computer Science and Engineering, Arasu Engineering College, Kumbakonam, Tamilnadu.



Principal
PRINCIPAL

ARASU ENGINEERING COLLEGE
Kumbakonam - 612 501



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Dr. M. JAYARAMAN ME, PhD, FIE
Principal

Ref No:VCET/ CSE/AICTE STTP/ 549 /2020-21

Date: 09.12.2020

Letter of Appreciation

We would like to thank **Dr.R.Devi Priya**, Associate Professor, Department of Information Technology, Kongu Engineering College, Perundurai for delivering a lecture on “Integrating BIoT – Theoretical & Programming aspects” scheduled on 05.12.2020 in the AICTE Sponsored 6 days online Short Term Training Programme on “Internet of Things (IoT) with Blockchain - Applications and Challenges” conducted by the Department of Computer Science and Engineering from 30.11.2020 to 05.12.2020 (Series-I).

The session was very informative with a very good feedback from the participants.



[Handwritten Signature]
Principal

Velalar College of Engineering and Technology,
Erode - 638 012.



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Dr. M. JAYARAMAN ME, PhD, FIE
Principal

Ref. No: VCET/ATAL-FDP / CSE / 424 / 2020-21

16.11.2020

To

Dr. R. Devi Priya,

Associate Professor,

Department of Information Technology,

Kongu Engineering College,

Perundurai,

Dear Madam,

Sub: Request to deliver the lecture in ATAL sponsored Five-days FDP on
“Augmented Reality (AR) / Virtual Reality (VR)”-reg.,

We are happy to inform you that our Department has sanctioned with AICTE ATAL FDP, in the thrust area of “Augmented Reality (AR) / Virtual Reality (VR)” from 07th to 11th December 2020. In this regard, we wish to invite to deliver an informative talk on the topic
“AR / VR in Healthcare” on **08.12.2020** in forenoon session (09.30 am to 11.00 am).

Your expertise and experience in your field will be a great contribution to this program and it will highly benefit the participants. We do very much hope that you will accept this invitation.

Thanking you,



(Signature)
PRINCIPAL
Principal

Velalar College of Engineering and Technology
Erode 638 012.



SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)
S.R.M. Nagar, Kattankulathur - 603 203.



DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

Appreciation Certificate

We appreciate the efforts put in by **Dr.P.SURESH**, Associate Professor, Department of Information Technology, Kongu Engineering College, Erode, for delivering Expert talk on “Cat Swarm Optimization”, on December 12, 2020 in the AICTE Sponsored virtual Short Term Training Program (STTP) on “Modern Optimization tools used in Engineering Field-V” (Season - 5) from 07.12.2020 to 12.12.2020 organized by the Department of Electronics and Instrumentation Engineering, SRM Valliammai Engineering College, Kattankulathur, Chennai-603203.

HOD/EIE

PRINCIPAL



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Website : www.vilms.ac.in email id : mbapincipal@gmail.com

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EDUCATIONAL INSTITUTIONS

Dr.V.Mohanasundaram., MBA.,M.Phil.,Ph.D
Director/VIIMS

24th Dec, 2020

APPRECIATION LETTER

This is to certify that **Ms.N.ANITHA**, Assistant Professor (SLG), Department of Information Technology, Kongu Engineering College, Erode has acted as a resource person for the Webinar on "Python - Industrial Perspective" on 24th December 2020. We appreciate her wonderful session and interaction with our students.


DIRECTOR
DIRECTOR,
Vivekanandha Institute of Information
and Management Studies,
Elayampalayam P.O., Tiruchengode Dt.
Namakkal Dt, Tamil Nadu - 637 205



VELAMMAL COLLEGE OF ENGINEERING & TECHNOLOGY

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Dr. N. Suresh Kumar, M.E., Ph.D.

Principal

Phone : 0452 - 2465285 / 2465849, TeleFax : 0452 2465289

Web : www.vcet.ac.in

E-mail : principal@vcet.ac.in

Date: 26.12.2020

Respected Sir,

Greeting from Velammal College of Engineering and Technology, Madurai. The Department of Computer Science and Engineering organized a Guest Lecture "Research on Deep Learning" on 24.12.2020. **Dr. M. Thangamani**, Associate Professor, Department of Information Technology, Kongu Engineering College, Perundurai, Erode has handled the online session. The Online session was very informative and useful to the Participants.

Thanking You

Convener

Dr. R. Vijayalakshmi

Associate Professor

Department of CSE



VIVEKANANDHA

COLLEGE OF TECHNOLOGY FOR WOMEN

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

WEBINAR

On

“Web Designing for Beginners”



RESOURCE PERSON

Dr.R.Rajadevi, AP[SLG]

Department of Information Technology,
Kongu Engineering College

Join with Google Meet:

<https://meet.google.com/jqv-gyap-hsn>



31st DECEMBER 2020



03:00 PM – 04:00 PM





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Dr. M. JAYARAMAN ME, PhD, FIE
Principal

RefNo:VCET/ CSE/AICTE STTP/772/2020-21

Date: 19.01.2021

Letter of Appreciation

We would like to thank **Dr.R.Devi Priya, Associate Professor,** Department of Information Technology, Kongu Engineering College, Perundurai for delivering a lecture on “Blockchain and IoT Programming” scheduled on 09.01.2021 in the AICTE Sponsored 6 days online Short Term Training Programme on “Internet of Things (IoT) with Blockchain - Applications and Challenges” conducted by the Department of Computer Science and Engineering from 04.01.2021 – 09.01.2021 (Series-II).

The session was very informative with a very good feedback from the participants.




Principal
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ERODE - 638 012.



KONGU ARTS AND SCIENCE COLLEGE

ERODE - 638 107, TAMILNADU, INDIA.



Autonomous Institution	Affiliated to Bharathiar University	Approved by UGC & AICTE	Accredited by NAAC	DBT Star College Scheme	ISO 9001 : 2015 Certified Institution
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Dr. N. RAMAN
Principal

26.02.2021

To

Dr.K.R.Prasannakumar,
Assistant Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai, Erode.

Sir,

Sub: Department of Computer Applications – Hands-on Workshop on Mobile Application Development held on 25.02.2021 and on 26.02.2021 – Thanks giving – Reg.

Greetings!

We like to express our heartfelt and sincere thanks to you for your gracious presence and presentation on the occasion of the **Hands-on Workshop on Mobile Application Development** on 25.02.2021 conducted by the Department of Computer Applications.

Your interesting presentation and insightful ideas on the occasion will be helpful to the students to explore much more in the field of Mobile Application Development.

We hope that we may be able to get your continued co-operation, support and assistance in our future endeavors also.

With Warm Regards,


PRINCIPAL

KONGU
Assuring the Best


26/2/2021

Office : 0424 - 2242802, 2242999	e-mail : konguarts@kasc.ac.in	Website : www.kasc.ac.in
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KONGU ARTS AND SCIENCE COLLEGE

ERODE - 638 107, TAMILNADU, INDIA.



Autonomous Institution	Affiliated to Bharathiar University	Approved by UGC & AICTE	Accredited by NAAC	DBT Star College Scheme	ISO 9001 : 2015 Certified Institution
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Dr. N. RAMAN
Principal

26.02.2021

To

Mr.K.Logeswaran,
Assistant Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai, Erode.

Sir,

Sub: Department of Computer Applications – Hands-on Workshop on Mobile Application Development held on 25.02.2021 and on 26.02.2021 – Thanks giving – Reg.

Greetings!

We like to express our heartfelt and sincere thanks to you for your gracious presence and presentation on the occasion of the **Hands-on Workshop on Mobile Application Development** on 26.02.2021 conducted by the Department of Computer Applications.

Your interesting presentation and insightful ideas on the occasion will be helpful to the students to explore much more in the field of Mobile Application Development.

We hope that we may be able to get your continued co-operation, support and assistance in our future endeavors also.

With Warm Regards,


PRINCIPAL

KONGU
Assuring the Best


26/2/2021



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------------------------	-------------------------------------	-------------------------	--------------------	-------------------------	---------------------------------------

Dr. N. RAMAN
Principal

26.02.2021

To

Mr.A.P.Ponselvakumar,
Assistant Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai.

Sir,

Sub: Department of Computer Applications – Hands-on Workshop on Mobile Application Development held on 25.02.2021 and on 26.02.2021 – Thanks giving – Reg.

Greetings!

We like to express our heartfelt and sincere thanks to you for your gracious presence and presentation on the occasion of the **Hands-on Workshop on Mobile Application Development** conducted by the Department of Computer Applications on 25.02.2021 and on 26.02.2021.

Your interesting presentation and insightful ideas on the occasion will be helpful to the students to explore much more in the field of Mobile Application Development.

We hope that we may be able to get your continued co-operation, support and assistance in our future endeavors also.

With Warm Regards,


PRINCIPAL

KONGU
Assuring the Best


26/2/2021



K.S.R. COLLEGE OF ENGINEERING

(An Autonomous Institution, Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai,
Accredited by NAAC with 'A' Grade and ISO 9001:2008 Certified Institution)

R. SRINIVASAN B.B.M.,
Chairman cum Managing Trustee

Dr. P. SENTHIL KUMAR M.E., Ph.D.,(IITM)
Principal

Ref.: KSRCE/CSE/2020-21/AICTE

Date: 13-03-2021

To

Mr. K. Logeswaran

Assistant Professor (Sr.G)

Department of IT

Kongu Engineering College

Perundurai.

Dear Sir/Madam,

Sub.: Thanking letter for being a Resource Person -Reg.

On behalf of the Computer Science and Engineering Department from K.S.R. College of Engineering, we would like to extend our heartfelt thanks for your participation as a Resource Person on 13.03.2021 for AICTE Sponsored Two Weeks Faculty Development Programme titled "Intelligent Objects & Technologies for Building Applications on Data Science with Machine Learning Techniques Using Internet of Things" from 08th – 21st March, 2021. Your lecture has been informative and motivational force to our participants greatly.

Thanking You,




Yours truly,

PRINCIPAL
K.S.R. COLLEGE OF ENGINEERING
K.S.R. Kalvi Nagar, Tiruchengode-637 215
Namakkal Dist., Tamilnadu



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN



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Elayampalayam - 637 205. Tiruchengode, Namakkal Dt., Tamil Nadu.

Phone : 04288 - 234560 (7 Lines), FAX : 04288 - 234033.

VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

Ref: VICAS/CS&CA/2019-2020/01/02

15.03.2021

Dr.V. PADMANABAN.,M.Sc.,M.Phil.,Ph.D.,
DEAN

CERTIFICATE OF APPRECIATION


To whomsoever it may concern

This is to certify that Dr. R. Rajadevi, Associate Professor(SLG),

Department of Information Technology, Kongu Engineering College, Erode **gave the informative Webminar on "Machine Learning Concepts" to our final year UG and all PG students of our Department of Computer Science and Applications on 13.03.2021.** Our students were very much impressed with her effective and informative session. Her quality of clarifying doubts of participants was also highly appreciated by one and it will motivate the students for their higher studies and achievements.

We are grateful for her enthusiastic contribution and excellent delivery of her knowledge.




DEAN
DEAN, PG and Research Department of CS and CA,
Vivekanandha College of Arts and Sciences
for Women (Autonomous).
Elayampalayam-637 205. Tiruchengode Tk. Namakkal Dt.

Dr. N. Mahalingam
Founder Chairman

Dr. M. Manickam
Chairman

Shri. M. Hari Hara Sudhan
Correspondent

Dr. C. Ramaswamy
Secretary

Dr. A. Rathinavelu
Principal

Ref.No: MCET/AUT/IT/BoS-13/2021/OF-

Date: 10.04.2021

To

Dr.S.Varadhaganapathy
Professor

Department of Information Technology,
Kongu Engineering College,
Perundurai, Erode-638060

Dear Sir,

Sub: MCET-IT – BoS meeting – Invitation to attend – Reg.

Greetings!!!

Thank you for accepting our invitation (through phone) to attend **Thirteenth Board of Studies (BoS) meeting** for Information Technology Board on **17th April 2021 (Saturday) at 11.00 AM** through online mode. Kindly join the meeting using the following Google Meet link (<https://meet.google.com/txt-rhtx-woi>). We will send you the draft curriculum and syllabi by email for your reference. We are looking forward to have your valuable suggestions during the said meeting. Sitting fee and DA will be provided as per the college norms.

For further clarification and assistance feel free to contact:

Dr.S.Ramakrishnan, Professor and Head, Dept. of IT,
Chairman IT BoS,
Mobile: **9442443181, 9942955547**
Email: hod_it@drmcet.ac.in, ramki@drmcet.ac.in

Thanking you,

Yours faithfully


PRINCIPAL

PRINCIPAL



VELAMMAL COLLEGE OF ENGINEERING & TECHNOLOGY

(Accredited by NAAC with 'A' Grade and by NBA for 5 UG Programmes)

(Approved by AICTE and affiliated to Anna University, Chennai)

Velammal Nagar, Madurai - Rameswaram High Road, Viraganoor, Madurai - 625 009, Tamilnadu.

Dr. N. Suresh Kumar, M.E., Ph.D.
Principal

Phone : 0452 - 2465285 / 2465849, Tele Fax : 0452 2465289
Web : www.vcet.ac.in E-mail : principal@vcet.ac.in

Date: 5.5.2021

Respected Sir,

Greeting from Velammal College of Engineering and Technology, Madurai. The Association of Computer Science and Engineering, organized a Seminar on "Data Analytics using open-source software for final year students on 3.5.2021.

Dr. M. Thangamani, Associate Professor, Department of Information Technology, Kongu Engineering College, Perundurai, Erode has handled the online session in the topic "Data Analytics" on 3.5.2021. The Online session was very informative and useful to the students.

Thanking You

Faculty In-charge

Dr.R.Vijayalakshmi

Associate Professor

Department of CSE



THAVATHIRU SANTHALINGA ADIGALAR ARTS SCIENCE TAMIL COLLEGE

Affiliated to Bharathiar University | Accredited by NAAC
Perur, Coimbatore-10.

This certificate is awarded to

Dr. M. Thangamani

ThavaThiru Santhalinga Adigalar Arts Science Tamil College

for her delivered lecture in National Level Webinar on “**THE IMPORTANCE OF SIDDHA MEDICINE AT THE PERIOD OF COVID-19 (Virtual Mode)**” organized by the Department of Mathematics, TSAAST College, Perur, Coimbatore, Tamilnadu, India on 16.05.2021.

DR. N. TAMILCHELVI
Principal

DR. THAVATHIRU MARUDHASALA ADIHAL
President Perur Aodheenam & Secretary of TSA Institution



Narasu's Sarathy Institute of Technology

Approved by AICTE | Accredited By NAAC | Affiliated to Anna University
Poosaripatty, Kadayampatti Taluk, Salem - 636 305, Tamil Nadu, India.

Phone: 04290 - 249661
04290 - 249662
Fax : 04290 - 249663
Mobile : 93449 72274

admin@nsit.edu.in

21.05.2021

To

Mr. K.Logeswaran

Assistant Professor (Sr.G) / IT
Kongu Engineering College,
Perundurai

Dear Sir,

Sub: Letter of appreciation – reg.

Thank you very much for delivering an informative and thought provoking Guest Lecturer Programme on **Application of Artificial Intelligence** held on 20.05.2021 for Narasu's Sarathy Institute of Technology Students through online mode.

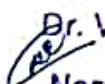
It was really a splendid presentation which exposed students in the field of Artificial Intelligence.

We appreciate you for making time in your busy schedule to speak with our students. Once again, we thank you for acted as a resource person.

Thanking you,


PRINCIPAL 21.05.21

(Dr.Munusami Viswanathan)


Dr. V. MUNUSAMI, M.E., Ph.D.,
PRINCIPAL
Narasu's Sarathy Institute
of Technology
Poosaripatty, SALEM - 636 305.





K.S.R. COLLEGE OF ENGINEERING

(An Autonomous Institution, Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai,
Accredited by NAAC with 'A' Grade and ISO 9001:2008 Certified Institution)

R. SRINIVASAN B.B.M.,
Chairman cum Managing Trustee

Dr. P. SENTHIL KUMAR M.E., Ph.D.,(IITM)
Principal

Ref.: 026/KSRCE/IT/SSD-IT/2020-21.

Date: 12.06.2021

To

Dr. P. Suresh

Associate Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai – 638060,
Erode District, Tamilnadu, India.

Sir,

**Sub.: Appreciate and convey thanks “Hands –On Training” for Students Skill
Development (SSD) Series - Reg.**

This is to certify that Dr. P. Suresh, Associate Professor, Department of Information Technology, Kongu Engineering College, Perundurai – 638052, Erode District, Tamilnadu, India, acted as resource person for the Technical Talk for Students Skill Development (SSD) Series in the title **“Hands – On Training Programme on Python for Data Science”**, held on 12th (Saturday), June 2021; in the Department of Information Technology, K.S.R. College of Engineering(Autonomous), Tiruchengode, Namakkal District, Tamilnadu, India. He shared his more informative ideas on Python for Data Science and his presentation was interactive. We appreciate and convey thanks for his valuable contributions.

Best Regards

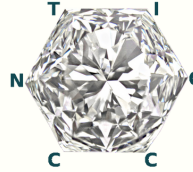


PRINCIPAL

PRINCIPAL

K.S.R.COLLEGE OF ENGINEERING
K.S.R.Kalvi Nagar, Tiruchengode-637 215
Namakkal Dist., Tamilnadu

Copy to: 1) Resource person
2) Department –IT File copy



THE TWELFTH INTERNATIONAL CONFERENCE ON COMPUTING, COMMUNICATION AND NETWORKING TECHNOLOGIES

July 6 - 8, 2021, Indian Institute of Technology - Kharagpur,
Kharagpur, West Bengal, India.

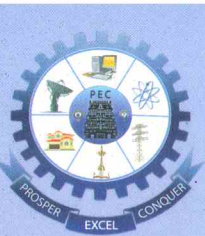
Certificate Of Appreciation

This is to commend

Suresh P

for his excellent contribution as Session Chair for
INTERNATIONAL CONFERENCE ON COMPUTING.
COMMUNICATION AND NETWORKING TECHNOLOGIES 2021,
July 6 - 8, 2021, held at IIT Kharagpur, India.

Conference Chair / Co-Chair



PAAVAI ENGINEERING COLLEGE

(Autonomous Institution)

(Approved by AICTE and Affiliated to Anna University)

(Accredited by National Board of Accreditation, New Delhi & NAAC (UGC) with 'A' Grade)

Paavai Nagar, NH - 7, PACHAL, NAMAKKAL - 637 018. Tamil Nadu

☎ 04286-243038, 58,88 & 98 Fax: 04286-243068 Email: pecprincipal@paavai.edu.in website: <http://pec.paavai.edu.in>

Date: 31.08.2021

Certificate

This is to certify that **Dr. M. Thangamani**, Associate Professor, Department of Information Technology, Kongu Engineering College, Perundurai, Erode had handled a session on the topic " Insight into Deep Learning " on 31.08.2021 in CSI Sponsored Workshop organized by the Department of Computer Science and Engineering of Paavai Engineering College, Namakkal. The Session was useful to the Faculty.

V.R.
31/8/21

Convener

V .Ravindra Krishna Chandar
Department Of Computer Science and Engineering



Presents

IEEE Technically Sponsored International Conference on

**ADVANCEMENTS IN
ELECTRICAL, ELECTRONICS,
COMMUNICATION, COMPUTING
AND AUTOMATION**
ICAECA 2021

**CERTIFICATE
OF APPRECIATION**

This is to certify that

DR. P. SURESH

KONGU ENGINEERING COLLEGE, ERODE.

in honour of his/her outstanding contribution as Technical Reviewer for
the manuscripts in 2021 International Conference on Advancements
in Electrical Electronics Communication Computing and Automation
(ICAECA2021) organized by Kumaraguru College of Technology, Coimbatore
and technically co-sponsored by IEEE Madras Section
conducted on 8 & 9 October 2021.

General Chair
Dr. P. Thirumoorthi
ICAECA'21

Principal
Dr. D. Saravanan
Kumaraguru College of Technology



AVP.

COLLEGE OF ARTS AND SCIENCE

[Affiliated to Bharathiar University, Coimbatore]

📍 No 4, Chettipalayam, T.M Poondi [P.O], Tirupur – 641 652, Tamil Nadu.

24.09.2021

ATTENDANCE CERTIFICATE

This is to certify that **Dr. M. Ramalingam**, Associate Professor, Department of IT, Kongu Engineering College, Perundurai has acted as the Resource Person for the one day webinar on the topic "**Recent Advancements in Networking**" organized by the Department of Computer Science, A.V.P. College of Arts & Science, Tirupur on 24.09.2021.



H. Anurag
24.9.21

PRINCIPAL

PRINCIPAL
A.V.P. COLLEGE OF ARTS AND SCIENCE
4, CHETTIPALAYAM, T.M POONDI (PO),
TIRUPUR - 641 652



KONGU ARTS AND SCIENCE COLLEGE

ERODE - 638 107, TAMILNADU, INDIA.



Autonomous Institution	Affiliated to Bharathiar University	Approved by UGC & AICTE	Accredited by NAAC	DBT Star College Scheme	ISO 9001 : 2015 Certified Institution
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Dr. N. RAMAN
Principal

27.09.2021

To

Mr.K.Logeswaran,
Assistant Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai, Erode.

Sir,

Sub: Department of Computer Applications – Workshop on Mobile Application Development held on 25.09.2021 and on 27.09.2021 – Thanks giving – Reg.

Greetings!

We like to express our heartfelt and sincere thanks to you for your gracious presence and presentation on the occasion of the **Workshop on Mobile Application Development** on 25.09.2021 conducted by the Department of Computer Applications.

Your interesting presentation and discerning ideas on the occasion will be helpful to the students to explore much more in the field of Mobile Application Development.

We hope that we may be able to get your continued co-operation, support and assistance in our future endeavors also.

With Warm Regards,

PRINCIPAL

KONGU
Assuring the Best



KONGU ARTS AND SCIENCE COLLEGE

ERODE - 638 107, TAMILNADU, INDIA.



Autonomous Institution	Affiliated to Bharathiar University	Approved by UGC & AICTE	Accredited by NAAC	DBT Star College Scheme	ISO 9001 : 2015 Certified Institution
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Dr. N. RAMAN
Principal

27.09.2021

To

Mr.A.P.Ponselvakumar,
Assistant Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai.

Sir,

Sub: Department of Computer Applications – Workshop on Mobile Application Development held on 25.09.2021 and on 27.09.2021 – Thanks giving – Reg.

Greetings!

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With Warm Regards,


PRINCIPAL





KONGU ARTS AND SCIENCE COLLEGE

ERODE - 638 107, TAMILNADU, INDIA.



Autonomous Institution	Affiliated to Bharathiar University	Approved by UGC & AICTE	Accredited by NAAC	DBT Star College Scheme	ISO 9001 : 2015 Certified Institution
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Dr. N. RAMAN
Principal

27.09.2021

To

Dr.K.R.Prasannakumar,

Assistant Professor,
Department of Information Technology,
Kongu Engineering College,
Perundurai, Erode.

Sir,

Sub: Department of Computer Applications – Workshop on Mobile Application Development held on 25.09.2021 and on 27.09.2021 – Thanks giving – Reg.

Greetings!

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With Warm Regards,

PRINCIPAL

KONGU
Assuring the Best

1.11.2021

Letter of Appreciation

We would like to thank Dr. R. Devi Priya, Associate Professor, Department of Information Technology, Kongu Engineering College, Perundurai for delivering a webinar on "Machine Learning and its Application" scheduled on 30-10-2021 between 2:00 PM to 3:30 PM conducted by the Department of Computer Science and Engineering & Information Technology. The session was very informative with a very good feedback from the participants.

nendur 01/11/2021
Dr.S.M.Nandhagopal., M.E., Ph.D.,

Head of the Department
Dept. of Computer Science and Engineering
Adithya Institute of Technology
Sathy Main Road, Kurumbapalayam,
Coimbatore - 641 107.



FACULTY TRAINING CENTRE

Government College of Technology, Coimbatore – 641 013

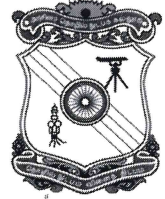
Tamil Nadu State Government Sponsored

Five Day Online Faculty Development Programme

On

“Emerging Trends in Internet of Things (IoT)”

22-11-2021 to 26-11-2021



CERTIFICATE OF APPRECIATION

This is to certify that **Mr. A. Jeevanantham / Assistant Professor / Information Technology / Kongu Engineering College, Erode** has delivered a guest lecture on the topic of “**IoT Open Source Data Visualization Tools**” on **24-11-2021** (FN) organized by the Faculty Training Centre, Government College of Technology, Coimbatore in association with Department of Electronics and Communication Engineering, Periyar Centenary Polytechnic College, Vallam, Thanjavur through *online mode*.



Professor / FTC

PROFESSOR

Faculty Development Training Centre
Government College of Technology
Coimbatore - 641 013.



MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)
Rasipuram - 637 408. Namakkal Dt., Tamil Nadu.

Date: 26.11.2021

Greetings from Muthayammal Engineering College, Rasipuram. The Department of Computer Science and Engineering and Technology Learning Centre in Association with Institution of Engineers (India)- IE(I). has organized two days workshop on 24.11.2021 and 25.11.2021. Ms. R. Aarthi, Assistant Professor/ IT, Kongu Engineering College, Perundurai, Erode has handled the topic "Zero Coding: Data Analysis for IoT using Node-Red". The sessions was very useful to the participants. Thank you for making the session successful and we appreciate your continued support.

Dr. G. KAVITHA, Ph.D.,
Professor

Department of Computer Science and Engineering
MUTHAYAMMAL ENGINEERING COLLEGE
(AUTONOMOUS)
RASIPURAM-637 408, NAMAKKAL Dist.
TAMILNADU.



MUTHAYAMMAL ENGINEERING COLLEGE

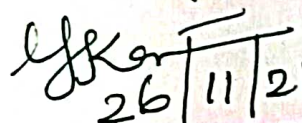
(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408. Namakkal Dt., Tamil Nadu.

Date: 26.11.2021

Greetings from Muthayammal Engineering College, Rasipuram. The Department of Computer Science and Engineering and Technology Learning Centre in Association with Institution of Engineers (India)- IE(I). has organized two days workshop on 24.11.2021 and 25.11.2021 .Dr.M.Thangamani, Associate Professor/ IT, Kongu Engineering College, Perundurai ,Erode has handled the topic "Zero Coding: Data Analysis for IoT using Node-Red ".The sessions was very useful to the participants. Thank you for making the session successful and we appreciate your continued support.


26/11/21
Dr. G. KAVITHA, Ph.D.,
Professor

Department of Computer Science and Engineering
MUTHAYAMMAL ENGINEERING COLLEGE
(AUTONOMOUS)
RASIPURAM-637 408, NAMAKKAL Dist.
TAMILNADU.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

AICTE - ISTE SPONSORED ONE WEEK ONLINE

INDUCTION/ REFRESHER PROGRAM ON

“Big Data Analytics for Smart Grid”

14.12.2021 to 20.12.2021



Organizing Committee

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Smt. S. Malarvizhi

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Managing Trustee

Patron

Dr. J. Janet

Principal

Convener

Dr. K.C. Ramya

Professor & Head
EEE

Coordinator

Dr. S. Sivaranjani

Professor, EEE

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Associate Professor, EEE

Dr. G. Radhakrishnan

Associate Professor, EEE

Organizing Members

Dr. B. Karthikeyan

Associate Professor, EEE

Ms. D. Gunapriya

Assistant Professor, EEE

Mr. S. Boobalan

Assistant Professor, EEE

Ms. D. Maladhi

Assistant Professor, EEE

02.12.2021

To

Prof.A.Jeevanantham,

Assistant Professor,
Department of Information Technology,
Kongu Engineering College, Erode.

Dear Sir/Madam,

Warm Greetings from Sri Krishna College of Engineering and Technology, Coimbatore!

We are organizing an AICTE ISTE sponsored one week online Induction/Refresher program on ‘Big Data Analytics of Smart Grid’ during 14.12.2021 to 20.12.2021.

In this regard, we are elated to invite you as a Resource Person to handle a Session on “Big Data Analytics for Smart Grid-Case Studies” on 20.12.2021 between 11.15 am to 12.45 pm. We look forward to your expertise and believe that the knowledge sharing in this domain would add to an excellent technical feast to the aspiring participants.

Looking forward towards the association.

With Thanks and Regards



Dr. K.C. Ramya
Professor & Head,
Department of EEE,
SKCET/ Coimbatore
ramyakc@skcet.ac.in

23.12.2021

Letter of Appreciation

We would like to thank **Dr. R. Devi Priya**, Associate Professor, Department of Information Technology, Kongu Engineering College, Perundurai for delivering an informative talk on “**Machine learning on IoT applications**” on 20-12-2021 and 21-12-21 FN conducted by the Department of Computer Science and Engineering & Information Technology. The session was very informative with a very good feedback from the participants.


Dr.S.M.Nandhagopal., M.E., Ph.D., 23/12/2021

Head of the Department
Dept. of Computer Science and Engineering
Adithya Institute of Technology
Sathy Main Road, Kurumbapalayam,
Coimbatore - 641 107.

23.12.2021

Letter of Appreciation

We would like to thank **Mr.N.Adhithyaa**, Assistant Professor, Department of Information Technology, Kongu Engineering College, Perundurai for delivering an informative talk on “**Machine learning on IoT applications**” on 21-12-21 AN conducted by the Department of Computer Science and Engineering & Information Technology. The session was very informative with a very good feedback from the participants.


Dr.S.M.Nandhagopal., M.E., Ph.D.,

Head of the Department
Dept. of Computer Science and Engineering
Adithya Institute of Technology
Sathyam Road, Kurumbapalayam,
Coimbatore - 641 107.