



Segmentation Analysis Techniques and Identifying Stress Ratio of Human Lumbar Spine Using ANSYS

E. Punarselfam^{1,*}, T. Kalavathi Devi², A. Sagai Francis Britto³, N. B. Prakash⁴, and P. Suresh⁵

¹Department of Information Technology, Muthayammal Engineering College, Rasipuram 637408, Tamil Nadu, India

²Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Perundurai 638060, Tamil Nadu, India

³Department of Mechanical Engineering, Rohini College of Engineering and Technology, Palkulam 629401, Tamil Nadu, India

⁴Department of Electrical and Electronics Engineering, National Engineering College, Kovilpatti 628503, Tamil Nadu, India

⁵Department of Mechanical Engineering, Muthayammal Engineering College, Rasipuram 637408, Tamil Nadu, India

The Finite Element Method [FEM] used to replicate the products and systems. In this method, the abnormality estimation of the spine has developed and presented in this paper. Spine injury found on vertebrae L1–L5 and its corresponding inter-vertebral disk. Different types of filters used to eliminate obtained noise, starting the MRI image at different levels. The noiseless image was segmented using differing Edge Detection Algorithm (EDA) such as Canny Edge Detection Algorithm (CEDA), Prewitt, Sobel, and Robert from the applied segmentation algorithm the best EDA identified and the 3D model for lumbar spine was created. After the segmentation algorithm, the FEA method utilized for examining images of the 3D human lumbar spine on different loads. The experiment conducted with the stress–strain relationship and Modal Analysis on Natural Frequency (NF) calculated. The entire analysis accomplished by real-time simulation software called ANSYS.

Keywords: Spine Disc Image, Finite Element Analysis, MRI Scan, MATLAB, ANSYS.

1. INTRODUCTION

The inactive appearance dominates every person as a new life. It prevails everywhere in our day to day life when we are relaxing. The spinal cord and its vertebrae joints help to balance the body. If any damage or injury occurs in the spinal cord makes the person could not undergo their healthy life and the costs felt by everyone. One of the growing social problems is spine disease and disorders. A method of accessing the spine load is limited and often requires invasive tests [1–3]. Invasive tests avoided, and it will not make the diagnosed person make better. Instead of performing invasive tests by the clinicians, the person should make preventive methods. The prejudiced investigations which used to analyze musculoskeletal load, and it consists of marking maps that belong to the human body for contemporary message over the perception of pain [4]. Given the qualitative information, subjective investigations used to assess the problem of an epidemiological review primarily. However, it cannot analyze static load mechanisms in detail. Therefore the physician uses such methods for sustaining studies of an unusual type. The musculoskeletal load will be assessed directly at the work stand. By determining it openly, it is likely to understand how persistent work is done by making use of load indicators by taking into account how individual tasks performed. And some of the factors like

worker's anthropometrical differences, performances of workers, the performance of complex activities are not considered, and finally, it is not precise was provided in detail by NIOSH OWAS method [5–7].

Nowadays, the average CT scan exposures more radiation effects over patients. That said, anyone who has a CT scan will address the dangers of radiation exposure and the benefits of early diagnosis with their doctor. MRI scans use strong magnetic fields and radio frequency signals to generate detailed pictures of bones, soft tissues, bone, and other internal body structures, unlike CT scans that use X-rays. On an MRI image, distinctions between normal and abnormal tissue are often more evident than that of a CT. And therefore, there is no radiation present in an MRI scan, so MRI scanning technique is used for diagnosis than a CT.

FEM uses various calculating methods of variations to provide a precise solution by minimizing an associated error function. These techniques are mainly engaged in identifying the solutions to mathematical studies and problems related to the physical reality of bone. The arrangement approach of the finite analysis method is built either in light of wiping out the differential condition entirely or rendering the Partial Differential Equation into an approximating arrangement, which is numerically incorporated and utilized for standard procedures [10].

Numerical simulation of the human disease diagnosing issues were related to sheet metal forming using the FEM can be able

*Author to whom correspondence should be addressed.



Economics and impact of recycling solar waste materials on the environment and health care

Sampath Kumar Venkatachary^a, Ravi Samikannu^{b,*}, Srinivasan Murugesan^c,
Narasimha Rao Dasari^d, Ragupathy Uthandipalayam Subramaniyam^e

^a Grant Thornton, Acumen Park, Fairgrounds, Gaborone, Botswana

^b Department of Electrical Computer and Telecommunications Engineering, Botswana International University of Science and Technology, Botswana

^c Department of Electrical and Electronics Engineering, Kongu Engineering College, Erode, Tamilnadu, India

^d Department of Electrical Power Engineering, College of Engineering, Defence University, Bishoftu, Ethiopia

^e Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Erode, Tamilnadu, India

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ABSTRACT

The growth of the renewable energy sector with solar energy resources playing a pivotal role, the proliferation of waste generated from the industry is a cause for concern. Globally the installed solar capacity is over 500 GW and is expected to rise further to 5000 GW by 2050. This phenomenal growth is expected to generate huge solar waste of up to 15% given the anticipated life span of 25 years. While the recent trends in solar research are aimed at improving little efficiency importance is given to waste disposal of dismantled solar power panels. Though recycling is an option, few companies are capable of handling recycling efficiently. To address this problem while ensuring environmental conservation and resource availability & recycling, the technologies adopted in the field are discussed and reviewed in this article. By 2050 60 million tons of solar waste will be there if it is not recycled properly. There view provides an in-depth assessment and the various technical aspects of the solar panel waste recycling and recovery, environmental protection, waste management. The economics of solar power recycling, impact on health and environmental and policies are discussed to ensure feasible and non-toxic technology for further development.

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1. Introduction

The growth of the renewable energy sector offers numerous benefits in the form of safety, reliability, efficiency, effects on the environment and so on. Solar energy technology has witnessed tremendous growth in the recent past, with investments ranging over billions of dollars. The user of solar power has also contributed tremendously towards the reduction in emissions, and it is this feature that has attracted governments across to spend, invest and attract investments in the sector. It is expected that the solar power will make up and replace a significant amount of energy generated by non-renewable energy sources (Bakhiyi et al., 2014) worldwide and is likely to aid in meeting energy demands across households. The entire world is working together in the process of implementing large scale solar power plants to satisfy the energy demand (Chi et al., 2014). According to world data (Table 1), the total solar energy generated accounted for

* Corresponding author.

E-mail addresses: sampathkumaris123@gmail.com (S.K. Venkatachary), ravis@biust.ac.bw (R. Samikannu), msriniee@gmail.com (S. Murugesan), dasarinarasimharao@gmail.com (N.R. Dasari), usr@kongu.ac.in (R.U. Subramaniyam).



Performance analysis of clock pulse generators and design of low power area efficient shift register using multiplexer based clock pulse generator

R. Murugasami^{a,*}, U.S. Ragupathy^b

^a Nandha Engineering College, Erode, India

^b Kongu Engineering College, Perundurai, India

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ABSTRACT

Shift registers are the essential elements that are capable of storing and transmitting the data in sequential mode in digital circuits. It consists of D flip-flops, which are connected in a successive manner and share the common clock pulse applied to each Flip-flop. However, the clock distribution network consumes the major portion among the whole power consumption. In this paper a novel clock pulse generation scheme, called as Multiplexer based Clock Pulse Generator (MCPG) is proposed to minimize the power consumption and reduce the silicon area occupation of the shift register by reconstructing the clock distribution network using MCPG. It generates multiple non overlapped clock pulses with minimum power utilization, less area and also resolves the inequality between arrival of clock pulse and data to the consecutive Flip-flops at different time. The proposed clock distribution method reduce area and overall power consumption up to 22% and 31% respectively, compared with shift registers implemented using conventional clocking methods. The optimized MCPG with Conditional Pass Logic Dynamic D Flip-flop(CPLDDFF) is also implemented in 256-bit arrayed shift register via an 8-bit Serial In Serial Out(SISO) sub shift register, save power up to 12%. The proposed system is realized using SPICE with CMOS 0.13 μm technology.

1. Introduction

In the modern digital data transmission era, Shift registers play a vital role used for data storage and data transmission in sequential form, built by involving the number of unique data Flip flops in a serial mode driven by a universal clock signal making them as a synchronous device. It is an essential device commonly used to convert from whichever a parallel to serial or serial to parallel format in serial transceivers, calculators and personal computers to shift the data to N bit position such as, binary numbers before they are processed in ALU. Nowadays, the size of the data is increased in communication transceivers and image processing ASIC's due to the high eminence image data causes, the shift register word length increases in the range of bits to kilobits. On the other hand the important design parameters such as power consumption and area occupation of the shift register increases predominantly. The major contribution for the power utilization is caused by the clock distribution network. To optimize the above said constraints and improve the performance of the clock distribution network, several approaches had been suggested in Ref. [1–8,10,13,14]. The internal architecture of the

shift register is modified to enhance the performance was proposed in Ref. [9,11,15,16]. More than a few kilobits data handling shift registers were discussed in Ref. [17–19].

A low power H-tree based clock network was proposed in Ref. [1]. The power conservation was achieved by a sinusoidal clock signal generated using a resonant clock originator combined with the single ended conditional capture energy recovery Flip-flop. Power efficient holdup buffer architecture with gated driver tree network procedure was adopted for the clock distribution can remove the power exhausted on drivers that need not be triggered. It can also eradicate the extreme data conversion without rise the load on the global clock signal presented in Ref. [2]. A multiple pulse generator approach was implemented instead of a single pulse generator approach discussed in Ref. [3]. Here the dynamic power consumption was diminished by reconstructs the existing circuit topology by grouping the pulsed latches and the number of pulse generator insertion depends upon the data load.

To improve the performance and reduce the power expenditure, an adaptive timing control system was introduced in the conventional clocking method employed in pipelines. It resolves the timing error

* Corresponding author.

E-mail addresses: murugasami.r@gmail.com (R. Murugasami), ragupathy.us@gmail.com (U.S. Ragupathy).

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ENGINEERING SCIENCES

Assessment of Drug Flow Rate in Skin Cancer Therapy for Enhancing the Drug Delivery System

MRUNALINI THANARAJ, RAJASEKAR RATHANASAMY &
PRAKASH M. JEGANATHAN

Abstract: The major impact in the clinical field is the harm posed by cancer. One most common type of cancer occurs in the skin. Though the conventionally existing modalities are successful in some cases, there is a need for new sensible methods to detect tumors at their initial stage. In accordance to these reasons and in addition to the incapability of the drugs to cross cellular barriers in skin the conventional administration methods are often compromised. To eradicate these problems the research work aims to develop the electrical analogue of skin involving layers like dermis, subcutaneous tissues, bones and muscular layers. The mathematical model has been developed to determine the electrical network of skin. The response of different skin layers are analyzed through simulation studies. It is observed that the cells present in each layer absorbs some amount of drug and let out the remaining to the neighboring layers. Further to minimize the diffusion rate of the drug a conventional controller has been incorporated and the results are analyzed by the contrast of the absorption and diffusion capacities for different layers of skin.

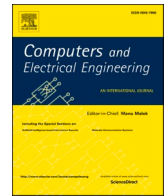
Key words: absorption rate, diffusion rate, drug delivery, electrical analogue, mathematical modeling, skin cancer.

INTRODUCTION

Cancer is a disease at the cellular level involving heritable disorders in cellular control mechanisms. The reason for this disease largely remains unknown. However various factors have been implicated. Certain undifferentiated cells proliferate uncontrollably and gives rise to tumors. According to microbial hypothesis either a virus or a microbe is a causative agent to induce cancerous growth. Some human cancer may be caused by retro viruses such as adult T cell leukemia. An inhibited immune response from aging, stressor severe systematic infection may promote cancer by preventing the body from destroying and recognizing cancer cells. Tumors are classified based on their origin and histological characters.

SKIN CANCER

Skin cancers may arise due to the ability of abnormal cells to invade or spread across body parts. There are three main types of skin cancer: Basal Cell Cancer (BCC), Squamous Cell Cancer (SCC) and Melanoma. The first two types along with a number of less common skin cancers are known as Non Melanoma Skin Cancer (NMSC). Basal-cell cancer grows slowly and can damage the tissue around it



IoT Based monitoring and control of fluid transportation using machine learning

Priyanka E. Bhaskaran^{a,*}, C. Maheswari^b, S. Thangavel^b, M. Ponnibala^c,
T. Kalavathidevi^c, N.S. Sivakumar^d

^a Senior Research Fellow, Department of Mechatronics Engineering, Kongu Engineering College, Perundurai, India

^b Faculty, Department of Mechatronics Engineering, Kongu Engineering College, Perundurai, India

^c Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Perundurai

^d Faculty, Department of Mechatronics Engineering, Tishk International University(TIU), Erbil, Iraq

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ABSTRACT

It is important to concentrate on monitoring and control of the pipeline transportation system before the failure resulting in fatal accidents. To enhance the supervision performances, the SCADA (Supervisory Control and Data Acquisition) platform is incorporated with IoT by utilizing the NB-IOT module holding a high-level engineering interface. In the proposed methodology, SCADA with the LQR-PID controller serves as Local Intelligence. When the local intelligence fails to react proactively during risk occurrences, immediately its performance is deactivated by the webserver through the NB (Narrow Band)-IoT module. For experimental real-time validation of the proposed work, a lab-scale DCS (Distributed Control System) based fluid transportation system is undertaken where flow and pressure prevail to be the most influencing parameters during risk occurrences in the pipelines. Also, the performance analyses are validated experimentally using unsupervised K-means clustering to identify abnormality caused by blockage and crack in the pipeline on the cloud-stored data.

1. Introduction

In recent years, communication occurs wirelessly to the remote information analytics center to examine and interpret the process behavior and provide the appropriate decision in case of risk circumstances. Through the use of the Proportional-Integral-Derivative (PID) controller, automated control systems facilitate complex transportation processes to be functioning safely and cost-effectively. This is attained by continually measuring operating parameters such as temperature, pressure, level, flow, and concentration, and creating decisions to open or close a valve, slow down or speed up a pump, or increase or decrease heat so that selected process measurements are sustained at the set range values. The main motivation for advanced control systems is safety since the loops having adequate performance are only 68% which are in manual mode. Hence in recent scenarios, the need for an advanced controller is increased to determine the optimal system performances [1]. Remote monitoring and controlling of the sub-station equipment are an important issue for the transportation management department which is normally done manually or using an expensive PLC and SCADA system. With the emergence of the internet and the computational era, a smart monitoring and reliable controlling system over the entire pipeline sensor parameters are highly desirable that can be achieved by introducing the Internet of Things (IoT) technology.

* Corresponding author.

E-mail address: priyankabhaskaran1993@gmail.com (P.E. Bhaskaran).

Moving Human Target Detection and Tracking in Video Frames

Manikandaprabu NALLASIVAM^{1*}, Vijayachitra SENNIAPPAN²

¹ Nandha Engineering College, Erode, 638052, Tamil Nadu, India
manikandaprabube@gmail.com (*Corresponding author)

² Kongu Engineering College, Erode, 638052, Tamil Nadu, India
dr.svijayachitra@gmail.com

Abstract: The conventional method for moving human target detection and tracking has come across a major setback due to various hindering factors such as environmental lighting conditions, temperature, etc. Similarly, it has been noticed that the manual selection of moving human targets in a video sequence does not provide convincing results either. In this paper, a new method for moving human target detection and tracking is proposed. It involves two stages. The first stage consists in the detection of moving human targets and the second one in target tracking based on the Continuously Adaptive Mean-Shift (CAMShift) algorithm. In the first stage, in order to select the moving target, the background subtraction method and frame subtraction method are combined. The Region Of Interest (ROI), which is usually the moving target is identified. In the second stage, target tracking is performed by choosing a centroid pixel point over the ROI, which is then used by the CAMShift algorithm. The proposed method has shown outperforming results for various performance parameters such as precision, accuracy, recall, and the F1-score under three different lighting conditions. The results obtained also show a reduction in time complexity in comparison with the state-of-the-art algorithms.

Keywords: Background subtraction, Frame subtraction, CAMShift algorithm, Target detection, Target tracking.

1. Introduction

Surveillance video systems are being increasingly used for everyday security. Surveillance cameras are available with various resolutions. The frame rate of each camera differs based on the resolution. Usually, the frame rate for a camera of average quality (1280 x 720) is around 30 fps. In an automated video surveillance system, moving target detection and tracking of dynamic circumstances remains a challenging task. For the detection of a moving target, a fixed background model is necessary, from which the foreground moving target can be extracted.

On the other hand, the foreground moving target may be extracted based on various features such as color, shape, edges, texture, etc. Trainable classifiers play a major part in automated systems and have proved to work efficiently in target detection with recorded video databases (Rahmaniar, Wang & Chen, 2019). The major drawback of the trainable classifiers is that the computational time for processing each frame exceeds the average frame rate of a camera (Guerrero-Ibáñez, Zeadally & Contreras-Castillo, 2018). Similarly, the application of a deep learning algorithm for this type of problem has become too expensive due to the need for a dedicated Graphical Processing Unit (GPU), and the database framing time and training time are also high when compared with the proposed algorithm (Algabri & Choi, 2020; Dou, Qin, & Tu, 2019).

These drawbacks are avoided by designing a simple, efficient algorithm for live monitoring in the automated surveillance system.

This paper is organized as follows. Section 2 presents the related works. Section 3 sets forth, the target detection process using background subtraction and frame subtraction methods. Section 4 describes the target tracking process using the CAMShift algorithm. Section 5 includes the experimental analysis and the related results. Finally, the conclusion is presented in Section 6.

2. Related work

Akli et al. (2021) proposed an active contour-based moving object detection and Kalman filter-based tracking with camera motion compensation. The active contour algorithm detects the exact boundary of the moving object and the detected object was tracked by Kalman filter. The implementation of Smooth Variable Structure Filter (SVSF) improved the robustness in motion estimation. Video stabilization achieved by using a homography matrix, reduces the unwanted camera vibrations, shakes, and motion blur. Similarly, another approach based on the Kalman filter and fusion of multi-resolution features was proposed by (Zhou & Zhang, 2019), it provides a solution for overcoming the shortcomings in the Siamese network. The Kalman filter was used

PERFORMANCE ANALYSIS OF VLSI ARCHITECTURE
OF VITERBI DECODER IN WLAN USING THE SLEEPY
KEEPER TECHNIQUE

Kalavathi Devi Thangavel, Sakthivel Palaniappan*,
Sathish Kumar Shanmugam**

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Abstract

Rapid developments in the field of wireless communication have created a rising demand for Viterbi decoder with long battery life, low power dissipation, and low weight. There is a necessity in high data bandwidth continuing to drive communications systems in convolutional coding for error control. In this paper, two techniques are incorporated to address the issues. The first is by including the circuit level design of the architecture of the Viterbi decoder using a sleepy keeper technique, which reduces the leakage power dissipation. The second method is by proposing the modified register exchange algorithm, which reduces the occurrence of error probability with low power in signal transmission in the wireless domain. The simulation of the design at the transistor level is carried out in T-SPICE with 45 nm TSMC. The results of the simulation specify that the proposed method improves the overall performance in terms of low power, high speed, and signal to noise ratio or BER which is used in WLAN application.

Key words: convolutional codes, power dissipation, SPICE, wireless communication, Viterbi decoder, bit error rate, leakage current, sleepy keeper technique



Diagnosis of lung cancer using hybrid deep neural network with adaptive sine cosine crow search algorithm

Surendar P.^{a,*}, Ponni Bala M.^b

^a Department of ECE, Vivekanandha College of Engineering for Women, Tiruchengode, 637205, India

^b Department of EIE, Kongu Engineering College, Erode, 638060, India

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Fast non local means filter

ABSTRACT

Lung cancer is a leading cause of cancer related deaths in all around the world. The identification of lung nodules is the significant step in the diagnosis of earlier lung cancer which can develop into a tumor. In the lung disease analysis, valuable information is provided by the Computed Tomography (CT) scan. The key objective is to find the malignant lung nodules and categorize the lung cancer whether it is benign or malignant. In this paper, propose a diagnosis of lung cancer using hybrid deep neural network with adaptive optimization algorithm. Initially, the preprocessing stage is performed using the fast non local means (FNLMM) filter. For the segmentation process, the Masi entropy based multilevel thresholding using salp swarm algorithm (MasiEMT-SSA) is used to segment the cancer nodule from the lung images. Using the grey-level run length matrix (GLRLM), different features are mined in the feature extraction. The binary grasshopper optimization algorithm (BGOA) is applied to select the optimum features for the feature selection (FS) process. Then the selected features are classified using the hybrid classifier named as deep neural network with adaptive sine cosine crow search (DNN-ASCCS) algorithm. The proposed hybrid classifier accurately detects the lung cancer. The proposed (DNN-ASCCS) is implemented by MATLAB using the Lung Image Database Consortium and Image Database Resource Initiative (LIDC-IDRI) datasets. The different performance metrics are evaluated and related to the existing classifiers and different state-of-art approaches. The simulation outcomes verified that the developed scheme is achieved a high classification accuracy (99.17 %) compared to other approaches.

1. Introduction

In bio-medical applications, image processing (IP) methods are generally applied [1]. Digital image processing plays a significant role in medical diagnostics [2]. Bio-medical image processing refers to the provision of digital image processing for biomedical sciences. Biomedical imaging is a dominant tool is used to envisioning the inner structures of the body and its infections [3]. To enhance the accuracy of detection approach, the real-time processing is a significant step in bio-medical field. In addition, the bio-medical imaging is used to analyse the fatal diseases like cancer in early stages which leads to more active treatments [4].

The most dangerous disease is cancer that causes deaths in humans [5]. Using the progressive methods, the various types of cancer like lung cancer [6], breast cancer [7], prostate cancer [8] and colon cancer [9] are identified. The early diagnosis of cancer plays a significant task to avoid cancer cells from spreading and multiplying [10]. Cancer patients

have more treatment options and a far great chance of survival when cancer is detected at its initial state. For the cancer analysis, a different imaging modalities such as CT, chest X-ray, magnetic resonance imaging (MRI) and positron emission tomography (PET) are utilized.

The CT scanner occupied the several detailed images and these images are merged by the computer into image of slices in which some nodules are round figured but not accurately malignant [11]. Therefore, the tumor analysis for a radiologist is a serious and time consuming task. CT image is more sensitive to discover the tumor size. In the early detection of lung cancer, the Computer Aided Diagnosis (CAD) has been referred a new step [12]. To improve the specificity, sensitivity, accuracy and cost-effectiveness of lung cancer, the CAD system is used [13]. To highlight the visible region that are affected by the disease, CAD system utilizes the digital images [14]. For the lung cancer prediction, the researchers have been developed the numerous CAD systems [15]. By deliberating the system-generated outcome with the clinical analysis, such systems support the radiologist to create a final decision.

* Corresponding author.

E-mail addresses: surenecmkce@gmail.com (S. P.), ponnibala@kongu.ac.in (P.B. M.).

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Analysis of Overloading in Trucks using Embedded Controller

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Kalavathi Devi Thangavel; Sakthivel Palaniappan; Gokul Chandrasekar; Chitra Muthusamy All Authors

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Abstract:

The primary cause for the rise in accidents is because of vehicle overloading, drunk driving. The overloading is either because of single mandrel or combination of tractor-trailer arrangement. It causes the problem to the proprietor, the driver and the authorities by allowing an increase in the number of accidents and damages to the road and public property. If the difficulty of overcapacity is not controlled, this burden is transferred to the road user; in terms of charges for the fuel expenses, vehicles toll fees, and fine by RTO. In this project, the weight or load of the vehicle is measured with the load cell that is placed under the chassis. Measured data is sent to the cloud with the help of Server. With the developed mobile app the information about the vehicle is monitored by the owner. Controlling is done through the ignition circuit used to turn off the engine. Therefore, the result shows that a surplus load can be monitored and controlled.

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Contents

I. Introduction

The objective of the proposed work mainly concentrates in the prevention of damage of roads by humans because of overloading and unauthorized, unlicensed driving. Common transportation availed by the public is the roadways. Every individual is accessed to the roadways by all means of communication. Apart from transportation [1] roadways help in developing the economy and improve the lifestyle of the people. As per the NHTSA (National Highway Traffic Safety Administration), due to truck accidents around 3900 fatalities and 104000 injuries happened during 2012. Mainly the accidents are happening as the truck collision takes place due to drivers control is out of focus. Although there are laws enforced by the central and state

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Comparison of BPN, RBFN and wavelet neural network in induction motor modelling for speed estimation

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Automatic Barrier Control in the Zebra crossing of Roads for Pedestrian Safety

S J Suji Prasad^{*1}, P Yugananth², R Kumaravelan³, R Suresh Kumar⁴, V Aravindan⁵, VA Harish⁶, S Janani⁷, and S D Kausika⁸

¹Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Erode, India. sjsujiprasad@gmail.com

²ADE – Nambiyur, Highways Department, C&M Wing, Coimbatore, India.

³Department of Mechanical Engineering, Velalar College of Engineering and Technology, Erode, India.

^{4,5,6,7,8} Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Erode, India.

*Email: sjsujiprasad@kongu.ac.in

Abstract. In the urban areas, the heavy road traffic makes the road crossing unsafe to the pedestrians. This paper aims to avoid accidents happening in the pedestrian crossing of traffic signals. The pedestrian collisions occur due to the unethical behaviour of the drivers skipping the signals. The proposed paper prevents these accidents by introducing automatic barriers for the zebra crossing. These barricades automatically lift during the pedestrian crossing and lay down during vehicle traffic. The defaulters of traffic signals are also monitored through the camera.

Keywords: Barrier control, Zebra crossing, Pedestrian crossing, Accident prevention.

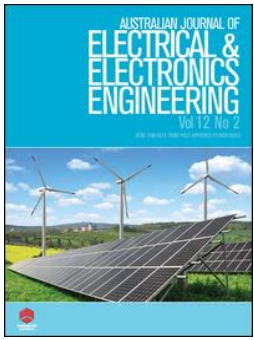
1. Introduction

Road transport is essential for mobility of people and goods as well as it contribute for India's development. The risk of road accidents exposes people to injuries and fatalities. The growth of population and lack of road infrastructure leads to poor road traffic in India and which results in unacceptable accidents, injuries and fatalities. In the year 2017, 4,64,910 road accidents were reported that claimed 1,47,913 human lives and 4,70,975 persons become injured. Out of four and half lakh lives, 13.8 percentage persons are pedestrians [7]. Safe walking on the road side and protection of pedestrians are to be promoted considering the risk factors. [13].

Smartphone play a major role in this development a vehicle pedestrian safety system. Smartphone generally help to reduce the 4, 00,000 fatalities from the pedestrian collision. This system warned both the pedestrian and the person who drives the vehicle. With the collaborative effort of two years with the Honda and Qualcomm to leverage safety system, so that vehicles can easily communicate through mobile phones to predict the possible collision between the pedestrian and the vehicle. The overview of the work is to warn both the driver and pedestrian so that they can easily take another action before the collision [14].

The simulation methodology was developed by [3] for pedestrian protection system. The system consists of active and passive protection systems with pedestrian warning system, hood lift system and airbags for pedestrians. Their results indicated that the proposed system can reduce pedestrian fatalities by 90 %.





Low power sleepy keeper technique based VLSI architecture of Viterbi decoder in WLANs

Kalavathi Devi Thangavel & Sakthivel Palaniappan

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ARTICLE



Low power sleepy keeper technique based VLSI architecture of Viterbi decoder in WLANs

Kalavathi Devi Thangavel^a and Sakthivel Palaniappan^b

^aEIE, Kongu Engineering College; ^bEEE, Velalar College of Engineering and Technology, Erode

ABSTRACT

Wireless communication technologies have advanced from cellular networks to satellite systems which create an advancing demand for low power battery operated decoding unit. Widely used error correction technique in the wireless communication systems is the channel coding. In channel coding, convolutional codes are commonly used for the transmission of data over a noisy channel. The methodologies adopted in the proposed design to achieve low power and increase in performance is by designing the architecture of the Viterbi decoder at circuit level design using a sleepy keeper technique, which curtails the leakage power dissipation. The second method is by including the modified register exchange algorithm, which reduces the occurrence of error probability with low power in signal transmission in the wireless domain. Simulation of the design is executed in 45nm TSMC in Tanner-SPICE. Promising results are obtained with reduction in power 31.54% with the CMOS technology for the WLAN frequency of 2.5MHz. BER performance of the design also found to be low in the channel environment.

ARTICLE HISTORY

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KEYWORDS

Convolutional codes; circuit; power dissipation; spice; signal to noise ratio; wireless communication; Viterbi decoder; bit error rate; frequency; leakage current; sleepy keeper technique; power

1. Introduction

Wireless Communication is the rapid growing and the largest part energetic technological region in the communication domain. The most important benefit of wireless communication is its mobility. Apart from mobility, it also provides flexibility and comfort in usage, possibly making it increasingly popular day by day. Advancements in Data Transmission through wireless communications have the chance to impress with various noises and interferences. The carrier signals which carry the information bits experience (Mandwale and Mulani 2015) modifications in their original content. It results in the corruption of the transmitted message. To sustain the ability of high-error correction in the signal at the transmission side Convolution coder is commonly employed in digital communications. At the receiver end to get the error-free signal, the maximum likelihood decoder that is the Viterbi decoder is furnished to get the original data.

Initially proposed in Viterbi (1967) as an error-correction method that suits for noisy digital communication. The Viterbi algorithm seems to be an efficient method for forward Error Correction (FEC), which increases the channel reliability. At present, convolution code is generally used in several digital communication systems in applications like satellite, deep-space communications, and 802.11 wireless LANs (Local Area Networks). The technique is also commonly used in speech recognition, keyword

spotting, and computational linguistics. A typical example of the Viterbi decoder is in the wireless LAN – IEEE 802.11a. There are so many blocks to be discussed in the block diagram representation, but in particular, the error detection capability is with the Viterbi Decoder located on the receiver side, which can restore and correct the original bitstream encoded from a noisy received message by the convolution coder. In signal transmission Leakage current is currently considered to be one of the key issues limiting the performance of the computer processor. If the reduction of leakage is not considered, then the application of Moore's law in circuit design would require not only new material solutions but also proper system design. With the aid of sleepy keeper methodology, this paper discusses the problems of leakage current reduction. The next point to be discussed is the use of a modified register exchange method to reduce the power minimisation with the occurrence of error reduction. Several authors have discussed Viterbi decoder architectures for the past two decades considering power reduction techniques (Mandwale and Mulani 2015), (Jinjin et al. 2012), (Naiping 2006); still, there is a demand for low power and high data rate when the communication is wireless. Design of the Viterbi decoder to obtain limited errors in Add Compare and Select (ACS) using two supply voltages is described in Abdallah and Shanbhag (2012). The low power VLSI architectures for the Viterbi decoder using Self Reset logic, Gate Diffusion Input, Asynchronous Dual-Rail logic is proposed in



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Abstract:
The main objective of this paper is to develop a Friendly Sewage Cleaning Robot to remove the blocks manually. To replace the human being in sewage cleaning by automated system and to prevent from hazardous chemicals. Presently, the sewage blocks are removed only by means of manual intervention. Because of this method, there is a threaten to cause many health hazards. Hence a methodology has been developed to reduce the work of high human effort. In this paper, Robot with an IR camera and IR sensor has been used. Blocks in the sewage can be identified using IR camera as well as IR sensor. The camera continuously captures the image in the sewage which can be monitored using PC. As the robot moves inside the sewage, IR sensor detects the presence of block. Once the block is detected, IR sensor gives the signal to the microcontroller, so that the blocks can be removed by means of arm movement of robot. This system limits the human involvement for the sewage cleaning process of sewaging system and prevents the infection of diseases to the mankind.

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Opportunities in Fruit Disease Identification and Classification with Machine Learning Algorithms

Suji Prasad S. J ^{1*}, Thangatamilan M², Vinosha B and Dr.V.Priya⁴

^{1*}Associate Professor, Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Erode, Tamilnadu, India

²Assistant Professor, Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Erode, Tamilnadu, India

³PG Student, Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Erode, Tamilnadu, India.

⁴Associate Professor, Department of Computer Science and Engineering, Mahendra Institute of Technology, Namakkal, Tamilnadu, India

ABSTRACT

Fruit disease causes a lot of economic loss and significant loss in agricultural production all over the world. The crops are affected by rough climatic conditions. Because of that, diseases on the plant are increased and agriculture yield is decreased. Nowadays, the requirements become worst because of bacterial infections and expanding population burdens farmers to increase yield. Modern agriculture will overcome this type of effect and improves agriculture. This paper focuses on the review of literature which studied fruit disease identification and control. The researchers used various algorithms for image segmentation, feature extraction, training and classification of fruit disease.

KEY WORDS: DISCRETE WAVELET TRANSFORM, FRUIT DISEASE, IMAGE PROCESSING, K-MEANS CLUSTERING, SVM.

INTRODUCTION

In the olden days, people identify fruit disease by their eye observability and made precautions. In this paper, three fruits namely apple, pomegranate, grapes and its diseases, are explained (Al-Hiary et al., 2011). Plant disease and fruit disease may affect the yield of growth. There are several spectroscopic and imaging techniques are used. Some fruit diseases can be identified by their

leaves, which get affected (Vimala Devi and Vijayarekha et al., 2014; Shiv Ram Dubey and Jalal et al., 2012). Fruit disease is automatically detected by using an automatic detection method to overcome the spreading of infection to the growing fruit. Pathogens, viruses, fungi attacks and affect the fruit. This will cause several diseases to the people who eat such fruit (Rashmi Pandey et al., 2013). So, several methods were implemented to identify fruit disease using image processing.

The several algorithms are used with the help of Matlab to this process. Discrete wavelet transform is one of the methods which help to identify in visual form. There are two methods one is a destructive method and the other is a non-destructive method. In the destructive method, the fruit will be removed and the process will be carried out (Rashmi Pandey et al., 2013; Anshuka Srivastava

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*Corresponding Author: sjsujiiprasad@gmail.com

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A Review on Recent Development for Diagnosis of Glaucoma

M.Ponni Bala¹, P.Rajalakshmi², A.Maria Sindhuja³, S.Naganandhini⁴

¹Associate Professor, Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Perundurai, Erode. ponnibala@kongu.ac.in

²PG student, Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Perundurai, Erode. rajikavi5398@gmail.com

³Department of Electrical and Electronics Engineering, M.Kumarasamy College of Engineering, Karur. mariasindhuja.eee@mkce.ac.in

⁴Department of Computer Applications, PSNA College of Engineering and Technology, Dindigul. nandhu.be2010@psnacet.edu.in

Abstract

Glaucoma is the prominent retinal diseases which amends the Optic Nerve Head in the retina of human eye. It cannot be completely treated, but earlier diagnosis prevents vision loss. In the medical domain, broad array of applications can be carried out using an image processing techniques. Diagnosis of retinal diseases is the major employment in image processing techniques. Recently the new non-invasive modality called Optical Coherence Tomography Angiography which could be applied for better analysis of eye diseases such as Age Related Macular Degeneration, Glaucoma and Diabetic Retinopathy. This paper deals with the exploit of Deep Learning techniques for Glaucoma diagnosis and its automated diagnosis system that helps the physicians to lighten their task crucially.

Key words-Glaucoma, Fundus Image, Retinal Nerve Fiber Layer (RNFL), Angio-OCT images, Vessel density, Deep Learning Techniques

1 Introduction

Glaucoma is one of leading retinal diseases results in visual impairments and its predicted to affect more than 118.2million people by the year 2040 [1]. Earlier diagnosis can prevent the vision loss. Thus, it is essential to do eye screening for detecting the glaucoma at earlier stage[2]. The major reason for Glaucoma is the frequent thinning of Retinal Nerve Fiber Layer(RNFL)[3]. Reducing the Intra Ocular pressure(IoP) is the promising treatment for better progression [4] . The typical treatment comprises of regular optometrist checkup, doubtful persons needs to perform a supplementary tests for final verification[5,6]. The entire study usually includes entire record of a patient and comprehensive eye examination [7]. However, these techniques has major drawbacks that it is a time consuming process and its available only in high cost[8].Currently, the fundus images, OCT modality and Angio-OCT images are commonly employed modality for examining the optic nerve.

The ratio of optic cup and optic disk is the main parameter to assess the Optic Nerve Head (ONH). When the optic nerve fibers gradually disappears, it may leads to glaucomatous stage. Fundus images intended feature such as Cup to Disk Ratio for classifying severity level of Glaucoma[9-11]. OCTA modality intended features such as Capillary, parafoveal density, vessel density and RNFL thickness measurements. OCT measured thickness parameter for classifying normal and eyes with mild to severe Glaucoma[12,13]. Parafoveal density shows good progression with excellent accuracy. Parafoveal superficial vessel density in healthy eyes is $(48.10 \pm 2.82\%)$ whereas in glaucomatous stage vessel density

Policy Approximations toward PV-Storage Energy Management Systems Using Machine Learning

Subramaniam.G¹,*P.Vidhyalakshmi²,

S Allirani³,S.Sivaranjani⁴,

B.Gunapriya⁵,K Selvaraj⁶

¹Department of Electrical and Electronics Engineering, ¹M.Kumarasamy College of Engineering, Karur, Tamilnadu, India.

²Department of electronics & instrumentation engg Assistant professor (Selection Grade),.Kongu Engineering college,Perundurai,Tamilnadu,India

³Associate Professor,Sri Ramakrishna Engineering College,Coimbatore.

⁴Assistant Professor, Department of Electrical and Electronics Engineering,Sri Krishna College of Engineering and Technology,Coimbatore.

⁵ Associate Professor, Department Of Electrical & Electronics Engineering, New Horizon College Of Engineering, Bengaluru.

⁶Professor, department of IT,PSNA College of Engineering and Technology,Dindgul.

(*Corresponding author's e-mail: gsubramaniamg@gmail.com)

Abstract

In this paper, we will propose a Policy Function Approximation (PFA) algorithmic program by applying machine learning to viably oversee Photovoltaic (PV) stockpiling frameworks. The algorithmic guideline utilizes a disconnected arrangement system designing stage and an online strategy execution stage. Inside the designing stage, a worthy machine learning strategy is utilized to concoct models that guide states (sources of info) and choices (yields) via training dataset. The training dataset is created by settling a settled smart home energy management drawback utilizing a suitable streamlining method [e.g., numerical programming or dynamic programming (DP)]. The representation created by the machine learning algorithmic the principle is then familiar with produce present decisions. Since the decisions are regularly made continuously, this approach will consider forward-thinking data on PV yield, electrical needs and battery condition. Besides, we will utilize PFA models over an extended measure of your time (for example months) without refreshing them anyway, every gaincomparative quality arrangement. Our outcomes show that the arrangements from the PFAs are near the very edge of the best arrangements acquired utilizing dynamic programming and surmised dynamic programming,thathastheburdenofrequiringastreamliningthe downside to being settled before the beginning of consistently or as new information on-request or PV become open. The vitality meter is upheld between network frameworks for this outline for power lawful offence examination. At the point when we get the abundant voltage from the board, it offers help to the lattice; thebatteryvitalitymeterisincorporatedintothe framework.

Keywords: Distributed Energy Resources(DER), demand response, policy function approximations, smart home energy management, machine learning, approximate dynamic

Performance Evaluation on Category Classification of an Images Using Convnet

K. Sheikdavood¹, K. Prabhu, S. Allirani³

¹Assistant Professor, Department of ECE, M. Kumarasamy College of Engineering, Karur, Tamilnadu

¹Associate Professor, Department of EIE, Kongu Engineering College, Perundurai, Tamilnadu

¹Associate Professor, Senior IEEE Member, Department of EEE, Sri Ramakrishna Engineering College, Coimbatore, Tamilnadu

Abstract:

To category, unknown things sometimes a very difficult task for a human and also machine in required commercial purposes. Unknown things like flowers, food, animals, medical modalities, and items that are not very known are unable to identify by us. The main objective of this work is helping the people who very poor in identifying things can do better with this system. Even for kids, we can train them from childhood as a PlayStation to make them master in their knowledge by using this system. This is a pre-trained deep learning system with more than 500 images as a database in each specific category. When a test image has been loaded it can give us test data belong to which category. This makes people know about unknown things with the highest efficiency. This system classified all the test data with efficiency above 97 %. The pre-trained deep learning system evolves with convolutional neural networks. It can convolve with all the features of the training image and forming the layers to provide an efficient classifier system for commercial purposes.

Keywords: CNN, ResNet 50

Introduction:

Human has very great functioning of system which is capable of categories the thing which we have come across in day to day life. But in the case of people in reserve places or very poor in identifying the things which are not familiar like medical image modalities were suffering to categories he things in general. Image modalities mostly categorized as CT, MRI, Ultrasound, PET, X-Ray, etc.. but these modalities not fixed for particular human organs. For example, consider the ultrasound image, it can be used to scan some parts of a body. But most of the time it can be used for the purpose of scanning to monitor the womb in women. This system is a more powerful system, to identify the test report and also to get which belong to a particular organs report. In context to above, this system can also support to find and category of living and non-living things in the universe based on our pre-training to the system through convolution

Closed Loop Speed Control of Blde Motor with Design and Modelling Using Fuzzy Logic Controller

TM Navinkumar¹, A.Anci Manon Mary², P.V. Gokila³,A.Saranya⁴,**M.Sasireka**⁵,S.Naganandhini⁶

¹Assistant Professor, Department of EEE, K.Ramakrishnan College of Engineering, Samayapuram.
E.mail:tmnavinkumar@gmail.com

²Assistant Professor, Department of EEE, Karpagam College of Engineering, Coimbatore.
E.mail:ancimary.a@kce.ac.in

³Assistant Professor, Department of EEE, J.K.K.N College of Engineering and Technology, Komarapalayam. E.mail:pvgokila@gmail.com

⁴Assistant Professor, Department of EEE, M.Kumarasamy College of Engineering, Karur.
E.mail:asaranyae2012@gmail.com

⁵Assistant Professor (Selection Grade), Department of EIE, Kongu Engineering College, Perundurai
Email:sasireka@kongu.ac.in.

⁶Assistant Professor, Department of CSE, PSNA College of Engineering and Technology, Dindigul.
Email:nandhu.be2010@psnacet.edu.in.

* Corresponding author mail id: asaranyae2012@gmail.com, tmnavinkumar@gmail.com

Abstract— Brushless Less DC motors have certain features such as large initial twisting speed, efficiency and long life and are also referred to as a compatible magnetic motor. Due to the making of similar motor for censorious application it is majorly applied in the industrial area. By analysing the BLDC motor with the normal induction motor and the DC motor has so many advantages such as longevity and no necessity for machine replacement. To stabilize the machine in this paper we have used the Proportional Integral Derivative controller and the sensible controller. In BLDC Motor by providing the gate signal a theta angle value is given. Using MATLAB Simulation features of BLDC vehicles such as rear EMM, speed, current limit.

Keywords— BLDC motor, Fuzzy logic controller, PID controller, Inverter circuit model.

I. INTRODUCTION

The DC motor main problem is maintenance and also the brushes are the main issue. In recent trends the brushless DC motor is the load utilised as it has high efficiency and reliability of the machine leads towards less maintenance [1-4]. The brushless DC motor is activated by electronically commutated method by means of voltage source inverter by modifying the frequency based on load. The rotor position modified by maintaining the electronic switches with stator winding properly energised in correct way so as to get continuous rotating emf on motor. In this way the electromagnetic interference sparking and friction can be eliminated.

By controlling the size and quantity of stator power the motion of the Brushless DC motor is balanced and the ratio of stator power to frequency is always maintained. Compared to a standard regulator the paper can examine high in different explanations [5]. The crossover Fuzzy drive regulator is utilized that changes the regulator to make it work better with a Brushless DC vehicle. Using the PWM process the switching process is generated according to overshoot, oscillation and other conflicting losses [6][11][12]. With the Xilinx FPGA Software 400E processor the incomprehensible control model is used in real time. Under

Research Article

Investigation on Dielectric Properties of Press Board Coated with Epoxy Resin, Quartz, and Rice Husk Ash

Banumathi S. ¹, Karthik T. S. ², Sasireka M. ³, Kiran Ramaswamy ⁴, Vishnu J. ¹,
Yuvan M. K. ¹, Kavin R. R. ¹ and Sathish Kumar S. ¹

¹Department of Electrical and Electronics Engineering, M.Kumarasamy College of Engineering, Anna University, Karur, Tamilnadu, India

²Department of Electronics and Communication Engineering, Aditya College of Engineering and Technology, Surampalem, Andhrapradesh, India

³Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Anna University, Perundurai, Tamilnadu, India

⁴Department of Electrical and Computer Engineering, Ambo University, Addis Ababa, Ethiopia

Correspondence should be addressed to Kiran Ramaswamy; maruthirkiran@gmail.com

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Epoxy resin mixed with rice husk ash and quartz powder increases its dielectric strength. This paper presents the dielectric properties of the press board coated with this epoxy mixture. In this work, the press board, which is used in the transformer, is coated with three components: epoxy resin, rice husk ash, and quartz powder. The nanometer-sized quartz powder and rice husk ash are mixed in the particular ratio with the epoxy resin. The mixture of epoxy resin, quartz powder, and rice husk ash is coated on both sides of the press board. The dielectric constant, volume resistivity, and Tan Delta (dissipation factor) of the coated press board are compared with the noncoated press board. The results reveal that the coated board is having high dielectric constant and volume resistivity when compared to the noncoated board.

1. Introduction

Insulators play a major role in electrical power transmission and distribution system. As the demand for electricity is increasing day by day, transmitting extrahigh voltage or ultrahigh voltage has become indispensable. So researchers are interested in doing many research studies with insulators. In the power system, three types of insulators commonly used are solids, liquids, and gases. Dielectric property and reliability are most important characteristics of any insulator. Introducing ecofriendly insulators or using naturally available materials along with the conventional insulator with increased dielectric strength has turned into a trend. In addition to the insulating property, the excellent mechanical and thermal properties are also required for an insulator for the consistent operation of electric power apparatus [1–6].

Insulators are the one which are essential parts of high-voltage engineering and are used to separate live conductors from the earthed objects such as transmission towers in transmission system and transformer tanks in transformers. Along with the understanding of the design, consistency, and protection, the researcher must know about its physical and chemical properties because only these properties decide the dielectric property of the particular insulating material.

In high-voltage power apparatuses, epoxy resin is used extensively because of its exceptional insulating behavior towards electricity, extraordinary resistance to heat, and good mechanical properties. Nanoparticles-filled epoxy exhibits good properties when compared to the epoxy filled with micrometer filler. The epoxy material with SiO₂ shows good dielectric properties when compared to the other fillers [7–10]. Silica obtained from the materials shows good

Research Article

Computational Investigations of Fixed-Free and Fixed-Fixed Types Single-Wall Carbon Nanotube Mass Sensing Biosensor

K. Umapathi ¹, Yalamanchili Sangeetha ², A. N. Shankar ³, P. Vidhyalakshmi ⁴,
R. Ramkumar ⁵, S. Balakumar ⁶ and D. Magdalinmary ⁷

¹Department of Electrical and Electronics Engineering, M.Kumarasamy College of Engineering, Karur, India

²Department of Information Technology, VR Siddhartha Engineering College, Vijayawada-7, Andhra Pradesh, India

³Department of HSE & Civil Engineering College, University of Petroleum & Energy Studies, Dehradun, Uttarakhand, India

⁴Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Perundurai, Tamilnadu, India

⁵Department of Electrical and Electronics Engineering, K.Ramakrishnan College of Technology, Trichy, Tamilnadu, India

⁶Faculty of Electrical and Computer Engineering, Arba Minch University, Arbaminch, Ethiopia

⁷Department of Electrical and Electronics Engineering, Sri Krishna College of Technology, Coimbatore, Tamilnadu, India

Correspondence should be addressed to S. Balakumar; sbk25dec@gmail.com

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Using carbon nanotubes for sensing the mass in a biosensor is recently proven as an emerging technology in healthcare industry. This study investigates relative frequency shifts and sensitivity studies of various biological objects such as insulin hormone, immunoglobulin G (IgG), the most abundant type of antibody, and low-density lipoproteins (LDL) masses using the single-wall carbon nanotubes as a biomass sensor via continuum mechanics. Uniform distributed mass is applied to the single-wall carbon nanotube mass sensor. In this study, fixed-free and fixed-fixed type single-wall carbon nanotubes with various lengths of relative frequency shifts are studied. Additionally, the sensitivity analysis of fixed-free and fixed-fixed type CNT biological mass sensors is carried out. Moreover, mode shapes studies are performed. The sensitivity results show better, if the length of the single-wall carbon nanotube is reduced.







1. Introduction

After discovering carbon nanotubes (CNT's) [1, 2], its utilization is found to be in diverse range of applications, such as nanomechanical resonators and nanobiological sensors. The unique great physical properties of the carbon nanotube lead to various usage in different fields such as nanoelectromechanical systems and actuators. [3–6]. The use of CNT in medical fields is enormous. Applications of CNT in electrochemical sensing [7–14], nanoactuators [15, 16], and nanosensors [5, 6, 17] are demonstrated. Nanomechanical resonators have been demonstrated in weigh cell, biomolecules, and gas molecules [18]. There is an increasing attention of CNTs in biological applications [5, 6, 19–21]. Difficulties of experimental and advantages of the theoretical modeling of nanoscale devices and CNTs are explained [3–5, 18, 22, 23].

By using CNT-based sensors, the sensing of volatile organic compounds related to human diseases is demonstrated [24], glucose oxidase (GOD) sensing using CNT is performed [25], and the extraordinary low detection limit of CNT working electrodes is shown [26]. Producing biosensors using CNT is an emerging trend. Many articles show the modeling techniques of elastic continuum mechanics concepts for analyzing the vibration of carbon nanotubes. The theory of the mechanical behaviors of materials dealing with continuous mass is called as continuum mechanics. There are two significances for the continuum modeling approach. It needs less work of the computational process than the molecular dynamics modeling, and nanostructures behavior analysis is much cheaper through the continuum model. Continuum beam and shell models have been elaborately studied. The beam theory concepts implemented using the single-wall carbon nanotube are explored [10]. The elastic

Research Article

Industrial Waste Water Recycling Using Nanographene Oxide Filters

P. Yuvarani ¹, S. Vijayachitra ², V. Ranganayaki³, S. Sathish Kumar ⁴,
K. Srujan Raju ⁵, M. Sivachitra ⁶, and Ishwarya Komalnu Raghavan ⁷

¹Department of EIE, M. Kumarasamy College of Engineering, Karur, Tamilnadu, India

²Department of EIE, Kongu Engineering College, Perundurai, Erode, Tamilnadu 638052, India

³Department of EEE, Dr.NGP Institute of Technology, Coimbatore, Tamilnadu, India

⁴Department of EEE, M. Kumarasamy College of Engineering, Karur, Tamilnadu, India

⁵Department of Computer Science and Engineering, CMR Technical Campus, Hyderabad, Telangana, India

⁶Department of EEE, Kongu Engineering College, Perundurai, Erode, Tamilnadu 638052, India

⁷Department of Electromechanical Engineering, Faculty of Manufacturing, Institute of Technology, Hawassa University, Hawassa, Ethiopia

Correspondence should be addressed to Ishwarya Komalnu Raghavan; ishwarya138@hu.edu.et

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Nanomaterials play a vital role in healthcare, electronics, manufacturing industries, biotechnology, and security systems. One such material is graphene and its oxides are specifically used for recycling industrial waste water. Graphene, a single layer in honeycomb cross section, provides excellent attention because of its significant optical, mechanical, and physical properties. GO was utilized to decrease the acidic or essential centralization of the mechanical wastewater into reusable water for the modern reason utilizing graphene channels. In this paper, sample solution (waste water) is taken from paper industry. Graphene channels can be created from the pencil graphite. Graphene has the high goals of separating capacity, and graphene is considered as “a definitive RO film” in light of its stronger, thinner, and more chemically safe nature than the polymer layers. Graphene oxide layers are likewise to be used in the desalination plant in place of the RO membrane.

1. Introduction

Nowadays, waste water coming from industries produces major problem to surroundings as well as creates pollution to the environment. Public and government forced the industries to recycle or reduce the waste coming out to stringent standards. Water is one of the primary sources for the process industries such as chemical industry, paper industry, food processing, and cement industry, as well as some other industries which used as coolants' boiler feed water. So, the water used should be free from toxic substances, scale-forming solutes, corrosive substances, and pathogens. Improper treatment will cause contaminations and reduction in processes and may result in poor performance, product deterioration, and sometimes overall

process failure. So, various factors need to be considered before designing the plant such as quality and quantity of water resources, water recycle, and discharge standards. So, appropriate water treatment facility should be planned earlier. Another important aspect in water treatment is that it should be fully investigated in order to analyse the nature of the constituents in the waste water because it may contain some microorganisms, other relative hazards, and metal ions. So, waste water treatment may be done in several levels. So, many industries are looking forward to implement better and portable treatment technologies. Graphene is obtained from pencils, and then, the oxidation process is carried out in order to scatter the carbon layers with oxygen molecules; then, carbon layers are completely separated into single or multilayer by means of reduction



An efficient LoRa-based smart agriculture management and monitoring system using wireless sensor networks

S. J. Suji Prasad, M. Thangatamilan, M. Suresh, Hitesh Panchal, Christober Asir Rajan, C. Sagana, B. Gunapriya, Aditi Sharma, Tusharkumar Panchal & Kishor Kumar Sadasivuni

To cite this article: S. J. Suji Prasad, M. Thangatamilan, M. Suresh, Hitesh Panchal, Christober Asir Rajan, C. Sagana, B. Gunapriya, Aditi Sharma, Tusharkumar Panchal & Kishor Kumar Sadasivuni (2021): An efficient LoRa-based smart agriculture management and monitoring system using wireless sensor networks, International Journal of Ambient Energy, DOI: [10.1080/01430750.2021.1953591](https://doi.org/10.1080/01430750.2021.1953591)

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An efficient LoRa-based smart agriculture management and monitoring system using wireless sensor networks

S. J. Suji Prasad^a, M. Thangatamilan^a, M. Suresh^b, Hitesh Panchal^c, Christoher Asir Rajan^d, C. Sagana^e, B. Gunapriya^f, Aditi Sharma^g, Tusharkumar Panchal^h and Kishor Kumar Sadasivuniⁱ

^aDepartment of Electronics and Instrumentation Engineering, Kongu Engineering College (Autonomous), Perundurai, India; ^bDepartment of Electronics and Communication Engineering, Kongu Engineering College (Autonomous), Perundurai, India; ^cDepartment of Mechanical Engineering, Government Engineering College, Patan, India; ^dDepartment of Electrical and Electronics Engineering, Pondicherry Engineering College, Puducherry; ^eDepartment of Computer Science and Engineering, Kongu Engineering College (Autonomous), Perundurai, India; ^fDepartment of Electrical and Electronics Engineering, New Horizon College of Engineering (Autonomous), Bengaluru, India; ^gDepartment of Computer Science and Engineering, Quantum University, Roorkee, India; ^hGujarat Technological University, Ahmedabad, India; ⁱCentre for Advanced Materials, Qatar University, Qatar.

ABSTRACT

The objective of this paper is to build up a LoRa-based smart agricultural management and monitoring system using Wireless Sensor Networks (WSNs) in rural areas, in order to replace the current technology of the agricultural monitoring system. A private network server is created and interfaced with a gateway that collects data or signals from end nodes and transmits the data to the cloud without the use of routers. The data can be used for end user application. The network interface is fulfilled by LoRa by solving communication failure problems and energy saving data transmission. This intelligent agriculture platform improves the efficiency of agricultural techniques.

ARTICLE HISTORY

Received 24 May 2021
Accepted 5 July 2021

KEYWORDS

LoRa; smart agriculture; Wi-fi; wireless sensor networks; temperature

1. Introduction

In recent years, due to the decrease in the usage of water and an increase in the crop yields, the implementation of the automated agricultural monitoring system is an important thing (Suresh et al. 2020; Karthik et al. 2020; Subasri et al. 2020). The availability of computer systems and modern electronics in the field of agriculture has shaped new research challenges. In recent years, many surveys and studies were conducted to measure the impact of agriculture transformation. In the past years, ZigBee and Bluetooth standards majorly established the low-power and short-range networks, enabling the users to use mesh network topology (Nishikori et al. 2017; Xiao and Li 2020). Even though they are considered for low cost, their major drawback is the coverage, usually up to 100 m (Dharshan et al. 2021; Kaushik et al. 2021; Patel et al. 2021; Senthil Kumar et al. 2021; Sharmila et al. 2021). Low Power Wide Area Network provides another solution for building long range and power, and also low rate transmission technology (Kabeel et al. 2020; Sheela et al. 2020; Ashokkumar et al. 2021). Long-range radio links are the major difference between LPWAN and previous technologies (Mekki et al. 2019). Another important key characteristic of LPWAN is star topology. LoRaWAN, NB-IoT and Sigfox are some examples of LPWAN. Each and every technology has its own advantages and disadvantages. All these technologies have a coverage distance of several kilometres and have their own advantages and disadvantages, in terms of the scalability, cost, data rate and power consumption. Among them, Lora is a new technology having the highest of which the LoRaWAN protocol operates (Germani

et al. 2019). It has the highest radio link budget and the best cost effective in this range against power tradeoff among its models. That is the reason for choosing LoRa modem as a radio link. At present, there are lot of developments happening in LPWAN networks. But, single technology cannot provide solutions to all the challenges. Thus LPWANs area unit employed to handle exclusively some on challenges in IoT. LPWANs are used specifically when there is a need for extended coverage, need of low power consumption network, involving devices with high data rates and with some delay tolerance. Particularly, monitoring the system conditions is perfect where LPWANs work perfectly. The main objective of the paper is to incorporate IoT and transceiving technology into the smart field environment (Siddique et al. 2019). Various types of sensor data are measured with their accuracy and these data integrated into the input of the sensor component.

An automatic miniaturised greenhouse monitoring system was developed (Ibrahim et al. 2019). This system will monitor constantly and continuously on environmental factors in the orangery, to make sure that it stay in preset levels of temperature and humidity. If the greenhouse surrounding condition is slightly diverge from preset values, and then the monitoring system will automatically turn the sensors in the devices to compensate the preset level conditions. For this monitoring system, four different types of sensors were used for automatic greenhouse monitoring setup implementation. All the data and signals from the sensor are given to the microcontroller which acts as the main control unit. These values are transferred to the

Early Detection of Lung Carcinoma Using Machine Learning

A. Sheryl Oliver¹, T. Jayasankar², K. R. Sekar^{3,*}, T. Kalavathi Devi⁴, R. Shalini⁵, S. Poojalaxmi⁵ and N. G. Viswesh⁵

¹Department of CSE, St. Joseph College of Engineering, Chennai, 600119, Tamilnadu, India

²Department of Electronics and Communication Engineering, University College of Engineering, BIT Campus, Anna University, Tiruchirappalli, 620024, Tamilnadu, India

³School of Computing, SASTRA Deemed University, Thanjavur, 613401, Tamilnadu, India

⁴Department of Electronics and Instrumentation Engineering, Kongu Engineering College, Erode, 638060, Tamilnadu, India

⁵School of Computing, SASTRA Deemed University, Thanjavur, 613401, Tamilnadu, India

*Corresponding Author: K. R. Sekar. Email: krsekarsastra@gmail.com

Received: 28 December 2020; Accepted: 07 May 2021

Abstract: Lung cancer is a poorly understood disease. Smokers may develop lung cancer due to the inhalation of carcinogenic substances while smoking, but non-smokers may develop this disease as well. Lung cancer can spread to other parts of the body and this process is called metastasis. Because the lung cancer is difficult to identify in the initial stages. The objective of this work is to reduce the mortality rate of the disease by identifying it at an earlier stage based on the existing symptoms. Artificial intelligence plays active roles in tasks such as entropy extraction through preprocessing strategies, ordinal to cardinal value conversions, table normalizations for easy meta computations, and preparation of machine learning tools for iterative processes to achieve rational convergence. The machine learning methodologies incorporated in this work are the cross-validation classification tree, random forest cross-validation classification, and random tree, all of which are included in an ensemble algorithm. The ensemble algorithm classifies lung cancer with maximum precision rates. The outcome of the classification provides 94.3% accuracy, which is the highest precision rate in comparison with the conventional methodologies. Semantics preprocessing of a lung cancer training set is performed with least entropy, and then translation, aggregation, and navigation based methodologies are applied for identifying the disease at its initial stage.

Keywords: Carcinogenic; cross-validation; classification tree; random forest; cross-validation; classification; random tree; translation; aggregation

1 Introduction

Lung cancer is one of the most common types of cancer today. It is a malignant tumour capable of growing at rapid rates in an uncontrolled manner. The malignancy of the tumour can be determined with the help of the ground-glass capacity strategy as well as image cropping and feature extraction using gray-level co-occurrence matrices (GLCM). Classification procedures have been accomplished with the



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Facial Expression Recognition Using Enhanced Convolution Neural Network with Attention Mechanism

K. Prabhu^{1,*}, S. SathishKumar², M. Sivachitra³, S. Dineshkumar² and P. Sathiyabama⁴

¹Department of EIE, Kongu Engineering College, Perundurai, 638060, Tamilnadu, India

²Department of EEE, M.Kumarasamy College of Engineering, Karur, 639113, Tamilnadu, India

³Department of EEE, Kongu Engineering College, Perundurai, 638060, Tamilnadu, India

⁴Department of EEE, CSI Engineering College, Ketti, 643215, Tamilnadu, India

*Corresponding Author: K. Prabhu. Email: kprabhuresearch1@gmail.com

Received: 24 April 2021; Accepted: 14 June 2021

Abstract: Facial Expression Recognition (FER) has been an interesting area of research in places where there is human-computer interaction. Human psychology, emotions and behaviors can be analyzed in FER. Classifiers used in FER have been perfect on normal faces but have been found to be constrained in occluded faces. Recently, Deep Learning Techniques (DLT) have gained popularity in applications of real-world problems including recognition of human emotions. The human face reflects emotional states and human intentions. An expression is the most natural and powerful way of communicating non-verbally. Systems which form communications between the two are termed Human Machine Interaction (HMI) systems. FER can improve HMI systems as human expressions convey useful information to an observer. This paper proposes a FER scheme called EECNN (Enhanced Convolution Neural Network with Attention mechanism) to recognize seven types of human emotions with satisfying results in its experiments. Proposed EECNN achieved 89.8% accuracy in classifying the images.

Keywords: Facial expression recognition; linear discriminant analysis; animal migration optimization; regions of interest; enhanced convolution neural network with attention mechanism

1 Introduction

Human expressions are one of the most effective forms of communications between humans. An expression can provide information on the internal emotional state of a human being. Expressions can flow from a speaker to a listener in a conversation and vice versa. In case of automatic recognitions, an expression can be treated as a deformation of the human face or changes in facial pigmentations [1]. A facial expression transfers around 55% of the intent in a communication which is more than what voice and language can convey together [2]. Researchers have been analyzing emotions, behavior and psychology of humans using FER which has generated significant interest in the areas of HCI, mental health assessments [3] and intelligent transport systems [4]. Moreover, Multimedia gadgets based on FER



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Sustainable Energy Technologies and Assessments

Volume 45, June 2021, 101125

Migrating from traditional grid to smart grid in smart cities promoted in developing country

Omnia Saidani Neffati ^a✉, Sudhakar Sengan ^b✉, Kalavathi Devi Thangavelu ^c✉, Sharma Dilip Kumar ^d✉, Roy Setiawan ^e✉, Mohanraj Elangovan ^f✉, Devi Mani ^a✉, Priya Velayutham ^g✉

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Abstract

Smart Grid is a term that encompasses the economic benefits of an intelligent and advanced power grid to reach changing responsibilities related directly to sustainability and energy efficiency. Considering the shortfall of alternative fuels in developed regions, the new smart grids, in order to have access to their environmental hazard, show that the average non-renewable and renewable energy sources can be integrated to reduce environmental disasters to improve production costs significantly. In order to provide reliable, secured, and cost-effective power grid functions, infrastructures can quickly and effectively co-ordinate power-sharing between several renewable energy sources freely accessible and economically demand costs. This article reviews the conceptual model, goals, architecture, potential benefits, and power grid issues with a complete and accurate understanding of the different defenders and people involved in the worldwide region scenario. The article examined energy and transmission issues, including smart grids and grid barriers, comprehensively.

[Previous](#)

Next



Keywords

Smart grid; Sustainable energy; Smart city; Solar; Wind; Energy storage

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FEEDBACK

IoT Based Moisture Control and Temperature Monitoring In Smart Farming

P R Karthikeyan^{1*}, Gokul Chandrasekaran², Neelam Sanjeev Kumar³, Elango Sengottaiyan⁴, Prabu Mani⁴, D T Kalavathi⁵, and V Gowrishankar⁶

¹Department of Electronics and Communication Engineering, Saveetha School of Engineering, Chennai, Tamil Nadu, India

²Department of Electrical & Electronics Engineering, Velalar College of Engineering and Technology, Erode, Tamil Nadu, India

³Department of Electronics and Communication Engineering, Anna University Chennai, Tamil Nadu, India

⁴Department of Electrical & Electronics Engineering, Nandha Engineering College, Erode, Tamil Nadu, India

⁵Department of Electronics & Instrumentation Engineering, Kongu Engineering College, Erode, Tamil Nadu, India

⁶Department of Electronics & Communication Engineering, Velalar College of Engineering and Technology, Erode, Tamil Nadu, India

Email: *karthikeyanpr.sse@saveetha.com

Abstract. The Internet of Things (IoT) has made a revolution in all the fields of human life by making the work be smart and effective. The IoT devices like sensors, controller, Wi-Fi module and the cloud play a significant part in smart farming which acquires yield in the field of farming and lessens the wastage. The goal of this paper is to propose the IoT based framework for the farmers by analyzing the live information like (moisture, temperature) in the cloud. The agrarian device is equipped with Arduino innovation and can be received through web servers with different sensors and live information transmissions through Thingspeak.com. The smart agriculture stick is proposed through this paper which is integrated with controller, sensor and live data that can be monitored through the cloud.

Keywords: IoT; Wi-Fi Module; Microcontroller; Agriculture; Sensors; Moisture; Temperature.

1. Introduction

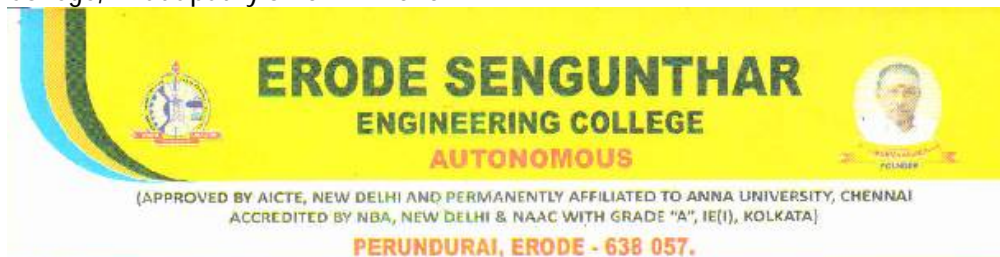
A greenhouse is a building or a house for plant growth. The dimensions of this structure range from small sheds to industrial buildings, depending on the unit requirements. The heat sink is a miniature house or a mini greenhouse. The greenhouses offer better control over the growing climate of the plants due to their smaller size. They allow the user to change or use them for small research purposes. Adjustable key factors, depending on the technical specifications of the greenhouse, include temperature, sun, shade, intensity, drainage, fertilizer and soil, and humidity. Greenhouses are valuable for solving scarcity or low productivity due to crop characteristics which include limited growing seasons and poor light, thereby increasing peripheral food production and saving time. Cash management technology is rapidly demanding precise, accurate and reliably quantifiable details outlined with the advancement of greenhouse gardening. In some nations, cable contact was used in most of the current cash management schemes, and the management states were also in the process of replacing other cables. This included high costs as well as problems with installation and maintenance,



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Contribution		Faculty Performance Evaluation -Others	
Criteria / Category		Outside world interactions (Knowledge transfer activities)	
S.No		Caption	Outside world interactions (Knowledge transfer activities)
Total Mark Claimed		6	

1. **Delivered an expert lecture** - AICTE Sponsored STTP on "Hybrid and Electric Vehicles: Development, Integration and Challenges" organized by Erode Sengunthar Engineering College, Thudupathy on 07.11.2020



Dr. V. VENKATACHALAM, B.E., M.S., M.Tech., Ph.D.
Principal

Ref: ESEC / AICTE – STTP / IQAC / EEE / 2020 - 21 06.11.2020

To

Dr S Vijayachitra
Professor and Head
Department of EIE
Kongu Engineering College
Perundurai 638060

Dear Madam,

Sub.: ESEC EEE AICTE / STTP – Resource Person –Request – Reg.

Warm Greetings from Erode Sengunthar Engineering College.


Erode Sengunthar Engineering College (An Autonomous Institution) approved by AICTE and permanently affiliated to Anna University, Chennai was established in the year 1996 for the upliftment of urban and rural youth by the philanthropic visionaries of Erode Sengunthar Educational Trust. The college offers twelve UG programmes, Nine PG programmes in Engineering and Technology and Master in Computer Application and Master of Business Administration. Civil Engineering, Computer Science and Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Mechanical Engineering and Chemical Engineering department are accredited by NBA, New Delhi. Our Institution is accredited by NAAC with highest grade 'A' and IE(I), Kolkata.

As a person of having good exposure and rich experience in Electrical field, we are very much happy to have you as a resource person for a session on the topic of "Vehicle Dynamics Control of Electric Vehicles" on 07.11.2020 Forenoon session (10.00 am to 12.00 pm). We strongly believe that your session will help us to enhance the knowledge in the field.

We request your consent and expecting your favorable reply for the same.


Thanking you,
With regards,
Principal

Dr.V.VENKATACHALAM, M.S., M.Tech., Ph.D.
PRINCIPAL
Erode Sengunthar Engineering College,
Thudupathy, Erode - 638 057



• Office: 04294 - 232701 / 702 / 703 • Fax: 04294 - 232705 • Principal : 04294 - 232705
• E-mail: contact@esec.ac.in • Visit us: www.erode-sengunthar.ac.in


2. **Delivered an expert lecture** - AICTE Sponsored STTP on "Hybrid and Electric Vehicles: Development, Integration and Challenges" organized by Erode Sengunthar Engineering College, Thudupathy on 28.11.2020



ERODE SENGUNTHAR

ENGINEERING COLLEGE

AUTONOMOUS



(APPROVED BY AICTE, NEW DELHI AND PERMANENTLY AFFILIATED TO ANNA UNIVERSITY, CHENNAI
ACCREDITED BY NBA, NEW DELHI & NAAC WITH GRADE "A", IE(I), KOLKATA)

PERUNDURAI, ERODE - 638 057.

Dr. V. VENKATACHALAM, B.E., M.S., M.Tech., Ph.D.
Principal

Ref: ESEC / AICTE – STTP / IQAC / EEE / 2020 - 21 24.11.2020

To

Dr S Vijayachitra
Professor and Head
Department of EIE
Kongu Engineering College
Perundurai 638060

Dear Madam,

Sub.: ESEC – EEE – AICTE / STTP – Resource Person – Request – Reg.


Warm Greetings from Erode Sengunthar Engineering College.

Erode Sengunthar Engineering College (An Autonomous Institution) approved by AICTE and permanently affiliated to Anna University, Chennai was established in the year 1996 for the upliftment of urban and rural youth by the philanthropic visionaries of Erode Sengunthar Educational Trust. The college offers twelve UG programmes, Nine PG programmes in Engineering and Technology and Master in Computer Application and Master of Business Administration. Civil Engineering, Computer Science and Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Mechanical Engineering and Chemical Engineering department are accredited by NBA, New Delhi. Our Institution is accredited by NAAC with highest grade 'A' and IE(I), Kolkata.

As a person of having good exposure and rich experience in Electrical field, we are very much happy to have you as a resource person for a session on the topic of "Vehicle Dynamics Control of Electric Vehicles" on 28.11.2020 Forenoon session (10.00 am to 12.00 pm). We strongly believe that your session will help us to enhance the knowledge in the field.

We request your consent and expecting your favorable reply for the same.

Thanking you,
With regards,



Principal
PRINCIPAL,
Erode Sengunthar
Engineering College,
Thudupathy, Erode-638 057.



• Office: 04294 - 232701 / 702 / 703 • Fax : 04294 - 232705 • Principal : 04294 - 232706
• E-mail: contact@esec.ac.in • Visit us: www.erode-sengunthar.ac.in

3. **Delivered an expert lecture** - AICTE-ISTE sponsored FDP on "Industrial Automation using PLC & SCADA " by Sakthi Polytechnic, Appakkudal on 03.02.21



SAKTHI POLYTECHNIC COLLEGE

AICTE Approved, Government Aided ISO 9001 -2008 Certified Institution
(A Unit of Sakthi Foundation)
NACHIMUTHUPURAM, APPAKOODAL, SAKTHINAGAR - 638 315
ANDHIYUR Tk, ERODE Dt. TAMILNADU.



Er. K.R.PALANISAMY M.E., MISTE.,
PRINCIPAL IN CHARGE

Off : 04256 - 246254, 246910

SPC/ ECE/ISTE/ 2021

22.01.2021

To

The Principal
Kongu Engineering College,
Perundurai, Erode, Tamilnadu-638060

Dear Sir,

Sub: AICTE-ISTE- Sponsored FDP- Deputing Resource person requisition- regarding

Greetings from Sakthi Polytechnic College.

We wish to state that we are conducting an AICTE-ISTE Sponsored Induction/Refresher Programme on "Industrial Automation using PLC & SCADA" for the Faculty members of Engineering Colleges/Polytechnic Colleges from 03.02.21 to 09.02.2021.

In this regard we request you to kindly depute your faculty member, Dr S.Vijayachitra, Professor & Head, Department of Electronics and Instrumentation to act as Resource person for a session on "INTRODUCTION TO AUTOMATION AND ITS TYPES" on 03.02.2021 (Wednesday).

Thanking you,

Copy to

Dr S.Vijayachitra,
Professor and Head
Department of EIE

With Regards


PRINCIPAL

3/6

HoD

4. **Delivered an expert lecture** - AICTE Sponsored Webinar STTP on " Art of rejuvenating the minds of students to overcome socio-economic issues and manage stress" TCE, Coimbatore on 05.02.2021

2/1/2021


Mail - Dr.S.Vijaya Chitra - Outlook

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Request to grant Permission to be a Resource person- AICTE-STTP- Reg

HI

HOD ICE <ice@tce.in>
Sat 1/30/2021 12:42 PM
To: principal_office@longu.ac.in
Cc: Dr.S.Vijaya Chitra



2 attachments (1,014 KB) Download all Save all to OneDrive - KVIT

Dear Sir,

Greetings. Tamilnadu college of Engineering is organizing a AICTE Sponsored 6 Days Webinar STTP on " Art of rejuvenating the minds of students to overcome socio-economic issues and manage stress" between 1st Feb to 6th Feb 2021.

In this connection, being the Principal Coordinator, I request you to permit Dr.Vijayachitra , Prof & Head, Department of Electronics and Instrumentation of your Institution to be a resource person on 5th Feb in this STTP.

I have appended the brochure and the flyers of the STTP - Phase 1 for your reference..

I am seeking permission for the STTP - Phase 2 .

Please do the needful at the earliest. Remuneration will be provided as per AICTE Norms.

With regards
Dr.G.Saravanakumar M.E.,Ph.D.,MBA
Prof & Dean
Department of Instrumentation and Control Engg
Tamilnadu College of Engineering
Coimbatore-641659

[Reply](#) | [Reply all](#) | [Forward](#)

5. **Delivered an expert Lecture-** AICTE Sponsored Webinar STTP on " Art of rejuvenating the minds of students to overcome socio-economic issues and manage stress" organized by TCE, Coimbatore on 12.02.21

FW: Request to grant Permission to be a Resource person- AICTE-STTP-3rd phase Reg

From: HO/ICE <ice@tce.in>
 Sent: Wednesday, February 10, 2021 2:22 PM
 To: Principal Officer <principal_officer@kongu.ac.in>; Dr.S.Vijaya Chitra <vijayachitra@kongu.ac.in>
 Subject: Request to grant Permission to be a Resource person- AICTE-STTP-3rd phase Reg

Dear Sir,

Greetings. Tamilnadu college of Engineering is organizing a AICTE Sponsored 6 Days Webinar- STTP on " Art of rejuvenating the minds of students to overcome socio-economic issues and manage stress" between 8th Feb to 14th Feb 2021.

In this connection, being the Principal Coordinator, I request you to permit Dr.Vijayachitra, Prof & Head, Department of Electronics and Instrumentation of your Institution to be a resource person on 12th Feb in this STTP.

I have appended the brochure and the flyer of the STTP. Please refer your memorandum.

Please do the needful at the earliest. Remuneration will be provided as per AICTE Norms.

With regards
 Dr.G.Saravankumar M.C,Ph.D,MBA
 Prof & Dean
 Department of Instrumentation and Control Engg
 Tamilnadu College of Engineering
 Coimbatore-641055

Resource Persons



"Socio-economic stress and its perspectives"
Dr. Regunath Parakkal
 Counselling psychologist, Life skill coach
 & Trainer of Trainers
 (Personal Dept. Govt. of India)



"Essential stress management skills for professionals"
Mrs. Sathyapriya
 Teacher-educator, Counsellor



"Students psychology and overcoming stress"
Mr. Babu Rangarajan
 Clinical psychologist
 AP Medical Center and Hospital, Salem



"Developing resilience to Stress"
Dr. Vijayachitra
 Professor and Head, KEC



"Stress management & Higher Studies"
Er. Sagar gurudass nayak
 Software Developer, Germany



"Practices to De-stress"
Mrs. R. Sasiprabha
 Life skill coach, Psychologist

Time 10.00 AM to 12.00 PM
 02.00 PM to 04.00 PM

E certificates will be provided for participants who successfully attends all the sessions and completes the e-assessment for all six days

Address for Communication

Dr.G.Saravankumar, Principal Coordinator STTP-AICTE
 Dean-Department of ICE, E-mail: ice@tce.in, +918903827798

5/6

HoD

6. **Delivered an expert Lecture-** Online FDP on "Artificial Intelligence – Applications" organized by Faculty training center, GCT, Coimbatore on 18.02.21



FACULTY TRAINING CENTRE
Government College of Technology, Coimbatore – 641 013
Tamil Nadu State Government Sponsored
Five day online Faculty Development Programme
On
"Artificial Intelligence - Applications"
15-02-2021 to 19-02-2021



CERTIFICATE OF APPRECIATION

This is to certify that Dr. S. Vijayachitra / Professor and Head / EIE / Kongu Engineering College, Perundurai has delivered a guest lecture on the topic of "Bio inspired computing and their applications" on 18-02-2021 (AN) organized by the Faculty Training Centre in association with Department of Electronics and Communication Engineering, Government College of Engineering, Thanjavur through *online mode*.



Professor / FTC

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



Vijayachitra S <dr.svijayachitra@gmail.com>

Invitation to Chair Technical Session_ICAECT 2021

1 message

ICAECT 2021 <icaect2021@gmail.com>

Wed, Oct 27, 2021 at 1:33 PM

To: Vijayachitra S <dr.svijayachitra@gmail.com>

Cc: svijayachitra@kongu.ac.in

Dear Dr. S. Vijayachitra,

Greetings from ICAECT 2021 !!!

Third International Conference on Advances in Electrical and Computer Technologies 2021 (ICAECT 2021) is organized by PSR Engineering College, Tamil Nadu, India, during 29 – 30, October 2021. ICAECT aims to offer a great opportunity to bring together professors, researchers and scholars around the globe a great platform to deliver the latest innovative research results and the most recent developments and trends in Electrical, Electronics and Computer Engineering and Technology fields. ICAECT 2021 received good responses from all across the globe and received more than 400 papers for consideration. A Total of 83 papers have been registered for the conference and will be presented during the conference.

I am glad to invite you to chair an online technical session at the Third International Conference on Advances in Electrical and Computer Technologies 2021 (ICAECT 2021) . The details of your session are

Session Name: EE01**Date:** 29.10.2021(Friday)**Time:** 11.30 am to 04.30 pm**Session Link:** meet.google.com/ikw-vkzr-mot

Once again thank you very much for your support. Please visit icact.co.in for more details on ICAECT 2021.

I do very much hope that you will be able to accept this invitation & grace the occasion.

With Best Regards,

Dr. THANGAPRAKASH SENGODAN

Organizing Chair, ICAECT 2021

Third International Conference on
**Advances in Electrical and Computer
Technologies 2021 (ICAECT 2021)**

29 - 30, October | Coimbatore, India | www.icact.co.in

CERTIFICATE

Session Chair

Publication Partner



This certificate is presented to



Dr. Vijayachitra S

Professor & Head,
Department of Electronics and Instrumentation Engineering,
Kongu Engineering College,
Perundurai-638060, Tamil Nadu, INDIA.

as a token of appreciation for her notable service as SESSION CHAIR for a technical presentation session and contributions towards the Third International Conference on Advances in Electrical Computer Technologies 2021 (ICAECT 2021) organized by PSR Engineering College, Sivakasi, Tamil Nadu, India during 29 - 30, October 2021. The Conference has been organized in ONLINE MODE.

Industry Partner
DILIGENTEC SOLUTIONS


Dr. Thangaprakash Sengodan
Conference Chair





M.KUMARASAMY
COLLEGE OF ENGINEERING

NAAC Accredited Autonomous Institution

Approved by AICTE & Affiliated to Anna University
ISO 9001:2015 & ISO 14001:2015 Certified Institution

Thalavapalayam, Karur - 639 113.



CERTIFICATE OF APPRECIATION

Presented to

Dr. S.Vijayachitra, Prof/EIE

K.E.C., Erode

for outstanding contribution as a session chair in the Virtual National Conference on Innovations in Electrical Power and Green EnergieS (NCIEPGES'21) organized by Department of Electrical and Electronics Engineering, M.Kumarasamy College of Engineering, Karur, held on 24th March 2021.

Dr.C.Kumar
HOD/EEE

Dr.N.Ramesh Babu
Principal

12/23/21, 12:29 PM

Gmail - Invitation - Dr.U.S.Ragupathy - Resource Person for AICTE - STTP Reg.



U.S. Ragupathy <ragupathy.us@gmail.com>

Invitation - Dr.U.S.Ragupathy - Resource Person for AICTE - STTP Reg.

5 messages

HoD/EEE KPRIET, Cbe <hod_eee@kpriet.ac.in>
To: ragupathy.us@gmail.com
Cc: principal@kongu.ac.in

Thu, Jul 30, 2020 at 8:01 PM

Dear Professor,

Greetings from KPR Institute of Engineering and Technology Coimbatore!

We are very much delighted to invite your goodself as a resource person for the AICTE sponsored STTP titled "Recent Advancements in Integration of Distributed Energy Resources for EV Charging Stations and Energy Management using Internet of Energy" during 03 to 08 August, 2020.

In this connection, you are requested to deliver the deliberations on "Softcomputing Techniques for Power Management".

The session is scheduled for 10.30 am to 12.30 pm on 04/08/2020 (Tuesday).

We are eagerly looking forward a positive reply at the earliest.

Thanking you

With Regards

Dr. V. Kumar Chinnaiyan
Professor and Head/EEE
KPR Institute of Engineering and Technology
Coimbatore - 641 407
09942999111
09994976234
0422-2635615

U.S. Ragupathy <ragupathy.us@gmail.com>
To: "HoD/EEE KPRIET, Cbe" <hod_eee@kpriet.ac.in>

Thu, Jul 30, 2020 at 8:19 PM

Thank you for your invitation and I accept the same.

Regards
Ragupathy
(Quoted text hidden)

HOD_Electronics and Instrumentation Engineering <hod_eie@kongu.ac.in>
To: "Dr. U.S.Ragupathy" <usr@kongu.ac.in>, "ragupathy.us@gmail.com" <ragupathy.us@gmail.com>

Fri, Jul 31, 2020 at 2:16 PM

With warm regards,
Dr.S.Vijayachitra
Professor and Head
Dept. of Electronics and Instrumentation Engg.
Kongu Engineering College
Perundurai, Erode - 638 060
Tamilnadu, INDIA,
Phone : +91 4294 226550
e mail : hod_eie@kongu.ac.in



SASTRA
DEEMED TO BE UNIVERSITY
(Listed in the UGC Act, 1956)

Ph: +91 4362 264101-108, 304000 - 25, Fax: +91 4362 264103, E-mail: deemed@sastra.edu, info@sastra.edu, www.sastra.edu

Dr. V. Badrinath

City Green Bank Chair Professor, School of Management
Dean, Corporate Relations & Extension Activities

20.04.2021

To

Dr. U.S. Raguvarthy
Chief Coordinator - Accreditation and Continuing & Higher Education,
Kongu Engineering College,
Erode

Subject: Letter of Appreciation

Dear Sir,

Greetings from SASTRA.

Thank you very much for being a resource person in the workshop organized at M. Kumarasamy College of Engineering, Karur under AICTE sponsored Margdharshan Scheme and delivering an informative lecture on "NBA Accreditation - Criteria 2&3" on 8th April 2021.

Your lecture covered the content and was delivered in a very good manner. Participants also expressed their appreciation through their positive feedback.

Looking forward to your continued support.

Yours sincerely,

Dr. V. Badrinath
Dean
Corporate Relations and Extension Activities
SASTRA Deemed to be University
Thanjavur

SHANMUGHAARIN, SCIENCE, TECHNOLOGY & RESEARCH SOCIETY

TIRUMALAISAMUDRAM, THANJAVUR - 613 401, TAMIL NADU

PHONE : 04362-304000 TO 010 & 04362-264101 TO 108

FAX : 04362-264120 URL : www.sastra.edu



M.KUMARASAMY
COLLEGE OF ENGINEERING

NAAC Accredited Autonomous Institution

Approved by AICTE & Affiliated to Anna University
ISO 9001:2015 & ISO 14001:2015 Certified Institution
AICTE Approval No. 732-53-004(MDGII) 97 dt. 22.10.1999



13.09.2021

CERTIFICATE OF APPRECIATION

This is to certify that Dr. U.S. RAGUPATHY, Professor/CCO Accreditation, Kangu Engineering College, Erode, has acted as resource person for the Workshop on "e-NBA-SAR PREPARATION GUIDELINES" organized by Internal Quality Assurance Cell of M.Kumarasamy College of Engineering, Karur, on 13th September 2021. The Session was very informative for the preparation of e-NBA-SAR.

Thanks & Regards

Dr. N. RAMESH BABU,
PRINCIPAL
M. Kumarasamy College of Engineering
THALAIAPALAYAM
KARUR - 639113.

12/23/21, 12:38 PM

Gmail - Fwd:



U.S. Ragupathy <ragupathy.us@gmail.com>

Fwd:

1 message

Periasamy Shanmugam <speriasamy.ps@gmail.com>
To: "U.S. Ragupathy" <ragupathy.us@gmail.com>

Thu, Oct 7, 2021 at 2:21 PM

Dr.P.S.Periasamy,
HoD/ ECE,
K.S.R College of Engineering,
Tiruchengode,
9442995539

----- Forwarded message -----
From: Periasamy Shanmugam <speriasamy.ps@gmail.com>
Date: Thu, Oct 7, 2021 at 2:18 PM
Subject:
To: Ragupathi U.S. <usr@kongu.ac.in>

Dear professor,
Warm greetings from KSR College of engineering. I hope you are doing well.

As per our discussion, I would like to cordially invite you to deliver a lecture in AICTE –ATAL
Sponsored online FDP on Sensor Technology.

The Date, time and topic of your lecture are as follows:

For your kind reference, I have attached entire program schedule..

DATE	TIME	TOPIC
07.10.2021	02.30 p.m	Real time ECG signal acquisition and analysis using LABVIEW
	To 04.30 p.m	

sir, please send your profile for introduction

thank you sir
Dr.P.S.Periasamy,
HoD/ ECE,
K.S.R College of Engineering,
Tiruchengode,
9442995539



P. A. COLLEGE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Accredited by NBA and NAAC with 'A' Grade)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
POLLACHI - 642 002 TAMIL NADU INDIA



Prof. Dr. D. Chitra,
Head of the Department

Mobile: 9486661800
Fax: 04256 - 221386
Website: www.pacolleges.org

Date: 20.12.2021

To
Dr. U. S. Ragupathy,
Professor,
Department of Electronics and Instrumentation Engineering,
Kongu Engineering College,
Perundurai

Dear Sir/ Madam,

Sub: Inviting for CSIR sponsored seminar- Reg:- Reg.


Greetings from P. A. College of Engineering and Technology, Pollachi.

We are so happy to state that the P. A. College of Engineering and Technology in association with Council of Scientific and Industrial Research (CSIR) is organizing a Two-Day National seminar on "Optimization and Parallelization approaches for Solving Scientific Problems" in our college from 23.12.2021 to 24.12.2021.

This programme gives an opportunity for the participants to meet different resource persons from Academic and Industry who share their experiences and connect with them.

In this connection, we are cordially inviting you to deliver a lecture on 23.12.2021 (FN) through google meet (Online). We kindly request you to provide us your availability on the above-mentioned date. We will be happy to receive you and feel privileged by your esteemed presence and your valuable thoughts.

With warm Regards,


Dr. D. CHITRA M.E., Ph.D.,
Professor and Head,
Dept. of Computer Science and Engineering
P.A. College of Engineering and Technology
Pollachi - 642 002



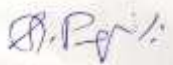
CERTIFICATE OF APPRECIATION

This is to certify that

Dr.R.Subasri.Professor

Kongu Engineering College Erode

has actively Shared his/her Valuable knowledge as a speaker for the one week **AICTE-ISTE** sponsored Induction/Refresher Course on "**Field Computations in Electrical Engineering**" Organized by Department of Electronics and Communication Engineering of CMR Engineering College from 3rd to 9th March, 2021.



Dr.S.Poongodi
Co-Coordinator



Dr.Suman Misra
HOD, ECE



Dr.A.Srinivasula Reddy
Program Coordinator & Principal



FACULTY TRAINING CENTRE

Government College of Technology, Coimbatore – 641 013

Tamil Nadu State Government Sponsored

Five day online Faculty Development Programme

On

“Artificial Intelligence - Applications”

15-02-2021 to 19-02-2021



CERTIFICATE OF APPRECIATION

This is to certify that Dr. N. Mahesh / Associate Professor / EIE / Kongu Engineering College, Perundurai has delivered a guest lecture on the topic of “AI in wireless sensor Networks” on 19-02-2021 (FN) organized by the Faculty Training Centre in association with Department of Electronics and Communication Engineering, Government College of Engineering, Thanjavur through *online mode*.



 01/03/2021

Professor / FTC

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



VELALAR

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

Approved by AICTE, New Delhi Vide F.No. 732-52-415 (E) 2001
Affiliated to Anna University, Chennai and Accredited by NAAC with 'A' Grade

Dr. M. JAYARAMAN ME, PhD, FIE
Principal

Ref:VDET / EEE / Webinar / 030 / 2020 - 21

26.06.2020

To

The Principal
Kongu Engineering College
Perundurai
Erode- 638060

Dear Sir,

Sub: Inviting Dr.T.Kalavathi Devi, ASP /EIE, Kongu Engineering College-
Resource Person -Webinar - reg

I cordially invite Dr.T.Kalavathi Devi, ASP, Department of EIE, Kongu Engineering College, Perundurai to deliver a technical webinar on the topic "**IoT and Industry 4.0 Opportunity Perspective**" in the webinar FDP series organized by the department of Electrical and Electronics Engineering, Velalar College of Engineering and Technology, Erode on July 3rd, 2020 at 2:00 p.m. to 4:00 p.m.

Thanking you,



[Handwritten signature]
26/6/2020
PRINCIPAL

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

----- Forwarded Message -----

From: mangai s <ishamangai@yahoo.com>

To: principal@kongu.ac.in <principal@kongu.ac.in>

Sent: Wednesday, September 16, 2020, 01:57:03 PM GMT+5:30

Subject: AICTE STTP on "Machine learning Techniques for Medical and Health care Applications" Session-2.

Respected Sir

We are glad to inform you that the Department of Biomedical Engineering of Velalar College of Engineering and Technology, Erode is Organizing AICTE sponsored six days Short Term Training Programme (STTP) "Machine learning Techniques for Medical and Health care Applications" Session-2.

In this connection, we wish to invite Dr.T.Kalavathi Devi, Associate Professor, Department of EIE as a resource person on 25.09.2020 in the online mode. Herewith I have attached the brochure for your reference. Looking forward towards your kind support and make this STTP a grand success.

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Approved by AICTE, New Delhi. & Affiliated to Anna University, Chennai.)
DEPARTMENT OF BIOMEDICAL ENGINEERING
(Accredited by NBA)
ALL INDIA COUNCIL FOR TECHNICAL EDUCATION
Sponsored

**SHORT TERM TRAINING PROGRAM (STTP) ON
MACHINE LEARNING TECHNIQUES FOR MEDICAL AND HEALTHCARE APPLICATIONS
(Season - 2)**

DAY 1 (SEPTEMBER 21)
TOPIC
Introduction to Machine Learning and its Algorithm
Dr. M. Sridevi,
Assistant Professor,
Computer Science and Engineering,
National Institute of Technology,
Tiruchirappalli.

DAY 2 (SEPTEMBER 22)
TOPIC
Working with Ensemble based classification Techniques for Clinical data
Dr. E. Sivasankar,
Assistant Professor,
Computer Science and Engineering,
National Institute of Technology,
Tiruchirappalli.

DAY 3 (SEPTEMBER 23)
TOPIC
FPGA Implementation of Deep Learning Algorithm for Biomedical Images
Dr. T. Kalavathi Devi
Associate Professor
Electronics and Instrumentation Engineering,
Kongu Engineering College,
Perundurai.

DAY 4 (SEPTEMBER 24)
TOPIC
Application of AI in Healthcare: Computer Aided Diagnosis
Ms. Amulya Prasad,
Biomedical systems Engineer,
XHNTIO Biodesigns,
Bangalore.

DAY 5 (SEPTEMBER 25)
TOPIC
Deep Learning Applications for Healthcare sector
Dr. V. Priya,
Associate Professor,
Computer Science and Engineering,
Mahendra Institute of Technology (Autonomous),
Namakkal.

DAY 6 (SEPTEMBER 26)
TOPIC
Future Prediction using Machine Learning Techniques
Mr. Surendar Manivannan,
Data Analyst,
ABE semiconductor designs,
Chennai.

FROM (21.09.2020 to 26.09.2020)
TIME: 1:30 PM to 4:00 PM
MEETING PLATFORM
zoom

CO-ORDINATORS
Ms. M. Menagadevi,
Ms. S. Maheswari,
Asst. Prof (Sr. Gr) / BME, VCET

CONVENER
Dr. S. Mangai,
Prof & HOD / BME,
VCET

PRINCIPAL
Dr. M. Jayaraman,
VCET

HANDS ON TRAINING BY
PANTECH SOLUTIONS,
CHENNAI



JAI SHRIRAM ENGINEERING COLLEGE

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

Dharapuram Road, Avinashipalayam, Tirupur - 638 660. Tamilnadu

Mobile : 90470 98310, 97869 21919

adminoffice@jayshriram.edu.in, www.jayshriram.edu.in

21.12.2020

To

The Principal
Kongu Engineering College
Perundurai
Erode -638060

Dear Sir

Sub: Inviting **Dr.T.Kalavathi Devi**, Associate Professor, Department of EIE-
Resource Person-reg

We are glad to inform you that the Department of Electronics and Communication Engineering (ECE), Jai Shriram Engineering College, Tirupur is organizing a series of technical lectures in view of Institution's Innovation Council through online mode.

In this connection we wish to invite **Dr.T.Kalavathi Devi**, Associate Professor, Department of EIE, Kongu Engineering College, Perundurai, Erode as a resource person to deliver a lecture on the theme "**Technical Project Idea Selection and Developing Effectual Paper Writing Skill**" for our students on 24.12.2020 from 2pm to 4pm. Looking forward for your kind support.

Thanking You,

Yours Truly

M. Vijayakumar
21-12-2020
Principal

Dr.M. VIJAYAKUMAR
PRINCIPAL
Jai Shriram Engineering College
Dharapuram Road,
Avinashipalayam, Tirupur-638660.

From: HOD ECE NCR <hod.ece.ncr@srmist.edu.in>
Sent: Saturday, November 21, 2020 10:53 PM
To: Mouleeshuwaraprabu R. <moulieie@kongu.ac.in>
Subject: Mail of appreciation - Guest Lecture on "Design of PID Controllers"

Dear R Mouleeshuwaraprabhu,

Thank you for delivering the lecture to our students about "Design of PID Controllers" . The students who attended really enjoyed your presentation by the way you explained from step by step types of controllers usage in PID . We appreciate you making time in your busy schedule to speak to SRMIST NCR members. Thank you again for your time.

Thanks & Regards

Dr. Pankaj Singh
HOD (ECE) - SRMIST - NCR Campus

Contribution		Other	
Criteria / Category		Outside World Interaction	
S.No.	iii	Caption	Invited Talk
Total Mark Claimed		02	

Invited Talk

S. No.	Responsibility	Mark Claimed
1.	webinar on “Innovation to Invention” in our J.K.K.Nattraja College of Engineering and Technology	01
2.	Session in TNSCST sponsored webinar on Recent Advancements in Infrared Thermography Techniques for Electrical Panels by KPR Institute of Engineering and Technology	01
Total		02

Page 2: S. No. 2 – Mail communication from JKKN

Page 3: S. No. 1 – Acknowledgement Letter

Page 4: S. No. 2 – Flyer

Page 5: S. No. 3 – Session Schedule

Documents

Academic / R&D/ IIPC/ Placement Coordinator

HoD/ CCO

Fw: Regarding the webminar host by IIC-KEC

Dr.R Parameshwaran <paramesh_r@kongu.ac.in>

Fri 31-07-2020 14:17

To: Dr.G.S.Rampradheep <rampradheep@kongu.ac.in>; praveenkumar.mts@kongu.edu <praveenkumar.mts@kongu.edu>; Karthik R.P. <rpkarthik.ece@kongu.ac.in>; Venkatesan B. <venkatesan.eie@kongu.ac.in>

 1 attachments (9 KB)

Thanks giving letter.docx;

well done...

Dr.R.Parameshwaran,
Chief Co-ordinator TBI(Technology Business Incubator),
Chief Co-ordinator - Planning (KEC),
President - Institution Innovation Council(IICKEC),
Professor,
Department of Mechatronics Engineering,
Kongu Engineering College,
Perundurai-638060
Mobile:+91-98659-19915

From: Principal Kongu Engineering College <principal@kongu.ac.in>

Sent: 31 July 2020 13:59

To: Dr.R Parameshwaran <paramesh_r@kongu.ac.in>; Institution innovative councc <iickec@kongu.ac.in>

Subject: Fw: Regarding the webminar host by IIC-KEC

Dr. V. Balusamy BE (Hons), MTech, PhD
Principal
Kongu Engineering College
Perundurai 638 060.
Ph: 04294220583
Mobile: 9942820583
email : principal@kongu.ac.in

From: Senthil V <senthil.v@jkkn.ac.in>

Sent: Friday, July 31, 2020 1:19 PM

To: Principal Kongu Engineering College <principal@kongu.ac.in>

Subject: Regarding the webminar host by IIC-KEC

Date:30.07.2020

From

Mr. Senthil,

HOD/ECE,

J.K.K. NATTRAJA COLLEGE OF ENGINEERING AND TECHNOLOGY

To

The principal,

Kongu Engineering college,

Respected Sir,

Sub: Sincere thanks for accepting the invitation.

I **Senthil.V HOD/ECE** ,On behalf of JKKN institution and **Department of ECE** I, earnestly thank the management and principal sir of **Kongu Engineering College** for accepting our invitation for hosting **two days (28.07.2020&30.07.2020)** webinar on “**Innovation to Invention**” in our **J.K.K.Nattraja College of Engineering and Technology** by your **IIC-KEC innovation ambassadors - Mr G.S.Rampradeep (IPR and its challenges), Mr.B.Venkatesan (Pre incubation and Incubation), Mr.S.Praveenkumar (Design Thinking and Innovation) and Mr.R.P.Karthik (How to kick start your Stratup)** .

The Sessions host by the ambassadors was very informative, interactive , most valuable and motivated for our students and staff members for their career. We look forward to work with our institution on further occasion.

I thank once again for giving us this opportunity and spend your precious time to share your ideas with us.

With Regards,

V.Senthil

Head, Department of ECE

J.K.K.Nattraja college of engineering and technology



**INSTITUTION'S
INNOVATION
COUNCIL**
(Ministry of HRD Initiative)



KPRIET supports the Sustainable Development Goals



TNSCST



Learn Beyond

**KPR Institute of
Engineering and
Technology**

(Autonomous, NAAC "A")

Department of Electrical and Electronics Engineering

**TNSCST Sponsored
Webinar**

**"RECENT ADVANCEMENTS IN INFRARED THERMOGRAPHY
TECHNIQUES FOR ELECTRICAL PANELS"**

18th and 19th March 2021

For Registration



<https://forms.gle/EUrp2zYrqT8dUYHZ9>



meet.google.com/mvp-wfgw-izm

Convenor

Dr. V.Kumar Chinnaiyan, Professor & Head/EEE

Organizers

Mr.C. J.Vignesh 9715068588

Ms. R. Revathi 8883782532

Mr. T.Jagadeesh 9940934028

TNSCST Sponsored Webinar

on

“Recent Advancements in Infrared Thermography Techniques for Electrical Panels”

18th March & 19th March, 2021

Day	Session I (10.30 AM - 12.00 AM)	Session II (02.00 PM - 03.00 PM)	Networking Tea (03.00 PM – 03.15 PM)	Session III (03.15 PM - 04.15 PM)
18/03/2021	Outlook of Research Challenges in Panel Board Wiring Er.K.V.Sivasamy Fulfill Technology Coimbatore	Thermography Imaging Systems and Applications Dr.U.S.Ragupathy Professor Kongu Engineering College		Thermal Image Analysis in Engineering Application Prof.Venkatesan Balakrishnan Assistant Professor Kongu Engineering College
19/03/2021	Applications of Infrared Thermography Dr. V.R. Vijayakumar Associate Professor & Head Department of ECE Anna University Regional Campus Coimbatore	Design and Development of Electrical Panels Er. Lokesh Engineer- Product Validation Emerson Automation Solutions		Fault Analysis in Electrical Panels and Mitigation Methods Er.S.Malarvili PEM – Digital ZF Wind Power Pvt Ltd. Coimbatore



ENTREPRENEURSHIP DEVELOPMENT AND INNOVATION INSTITUTE

(An autonomous society of the Government of Tamil Nadu)

Parthasarathy Koil Street, SIDCO Industrial Estate,
Ekkaduthangal, Guindy, Chennai 600032, Tamil Nadu

Tel : +91-44-2225-2081/82/83/84

Web : www.editn.in



S.Nagarajan, I.A.S.,
Director

Date: 27.07.2020

Lr.No.2270/EDII/JD/2018

Sir,

Sub: EDII - Innovation Voucher Programme (IVP) -
Proposal submitted under IVP – Details requested –
Reg.

Ref: IVP Proposal sent by Snifty Technologies

As per the above reference, this is to inform that your proposal has been approved by the Steering Committee under “**Innovation Voucher Programme**”.

In this regard, the details of the recommendations and terms and conditions are as follows:

1. Name of the Company : Snifty Technologies
2. Project Title : Waterless Dyeing Machine
3. Voucher Type : Voucher – A
4. Maximum Duration : 12 months
5. Knowledge Partner : Kongu Engineering College
6. Budget Summary :

Budget Breakup (In Rs.):					
Item	1 st Installment 50%	2 nd Installment 40%	3 rd Installment 10%	Start-up/MSME Contribution	Total
Recurring	97,200	77,760	19,440	48,600	2,43,000

7. Fund releasing Pattern :
 - i) 1st Installment: 50 percent of the eligible grant on signing of the Tripartite agreement.
 - ii) 2nd Installment: 40 percent on submission of the Progress report, Utilization Certificate, Photos & Videos, etc. and its acceptance by the EDII within the time frame stipulated in the agreement
 - iii) 3rd Installment: Remaining 10 percent on completion of the project and presentation of the final report being made before the Technical / Steering committee and the completion report found acceptable.
 - iv) Start-up/MSME Contribution has to be paid to the knowledge partner before the release of 2nd Installment.
 - v) Knowledge partner Institution should release the fund to the Project Management Team immediately without any delays whenever requested.
 - vi) The Knowledge Partner should also monitor the Expenditure Pattern and submit Utilization Certificate to EDII before requesting of Subsequent Installments.
 - vii) Knowledge Partner must submit monthly progress reports of the project to EDII regularly.
8. Terms & Conditions of the grant:

- The general terms and conditions applicable to each assignment under this Scheme will be:
- (i) The assignment should be completed within the time stipulated in the agreement. For factors beyond the control of the MSME/Start-up given the assignment, suitable extension in time may, however, be granted at the request of the institution.
 - (ii) The EDII shall not pay any extra amount for any escalation in the cost of the assignment beyond the time period stipulated in the agreement.
 - (iii) The total grant for the study as agreed with the organization will include service tax and other tax, if any, and the liability of payment of the tax will be of the Institution conducting the study.
 - (iv) 2 hard copies of the final report, 5 hard copies of the executive summary and soft copy containing the final report shall be submitted before releasing the final installment of payment.
 - (v) During the period of the assignment, EDII may modify the TOR and other terms and conditions of the assignment, if necessary, in order to strengthen/deepen its scope/coverage. As far as possible, such modifications will not be made more than once during the period of study and with the due concurrence of the MSME/Start-up concerned.
 - (vi) In case of change of contact person during the period of study, the new contact person may be appointed by the MSME/Start-up with the prior approval of the EDII.
 - (vii) Any changes in the proposed work plan should be intimated to EDII and get prior approval from the Steering Committee
 - (viii) If the performance of the MSME/Start-up during the period of the study is not found to be satisfactory, the agreement can be terminated.
 - (ix) The Knowledge partner should have empanelled with EDII.

You are requested to furnish us the following documents immediately:

- Tripartite Agreement
- Detailed milestones
- Detailed Budget split-up
- Consent letter from Knowledge Partner
- UAM Registration/Startup India DPIIT Registration Certificate

Sd/*
Director**

/By Order/


Deputy Director

**To,
Snifty Technologies**

KONGU ENGINEERING COLLEGE

(Autonomous)

PERUNDURAI ERODE - 638 060 TAMILNADU INDIA

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

Mr.D.SELVAKARTHI M.E.,

Assistant Professor (Sr.G)

Department of Electronics and Instrumentation Engineering

Utilization Certificate

1.	Title of the Project	Waterless Dyeing Machine
2.	Name of the Company	Snifty Technologies, Perundurai.
3.	UAM Number/DPIIT Registration Number	TN07A0045343
4.	Fund Received from EDII-TN	97,000.00
5.	Fund Received from the Company / Fund Spent by the Company	49,000.00
6.	Actual expenditure (Excluding commitments) incurred	1,49,478.50
7.	Balance amount available	--
8.	Committed expenditure if any	--
9.	Unspent balance refunded to EDII-TN, if any (details of Cheque No./UTR No. given)	--

Certified that the amount of Rs 1,46,000.00 has been utilized for the purpose of Grant under Innovation Voucher Programme for it which was sanctioned.

Certified that the conditions on which the Grant was sanctioned have been duly fulfilled /are being fulfilled and that we have exercised necessary checks to see that the amount was actually utilized for the purpose for which it was sanctioned.

Signature of the
Company

P. Deevan
8/9/21
REGISTRAR
KONGU ENGINEERING COLLEGE
THOPPUPALAYAM (PO)
PERUNDURAI (TK), ERODE - 638 060

Signature of the
Knowledge Partner

Phone: 04294- 226546
Website: www.kongu.ac.in

Mobile: +91 9789951541
Email: selvakartheie@kongu.edu



D.SELVAKARTHI, M.E.,
ASSISTANT PROFESSOR (SENIOR GRADE)
DEPARTMENT OF ELECTRONICS AND
INSTRUMENTATION ENGINEERING
KONGU ENGINEERING COLLEGE,
PERUNDURAI, ERODE - 638060.



Tamil Nadu Newsprint and Papers Ltd.

Kagithapuram - 639 136. Karur Dt, Tamil Nadu.

CERTIFICATE

HR/31/23/PW/EIE/2021/01/01

February 27, 2021

Name : S.K.ARUN KOUSHIKH


Department : B.E (EIE)

Name of the Institution : Kongu Engineering College
Erode

Department in which
Undergone Project : Instrumentation

Project Title : Hydac Filter Automation

Project Duration : From 20.01.2021 To: 18.02.2021


SR. MANAGER - HR

V. RAJARAM

Sr. Manager - HR

Tamilnadu Newsprint and Papers Ltd.,
Kagithapuram, Karur - 639136





Tamil Nadu Newsprint and Papers Ltd.

Kagithapuram - 639 136. Karur Dt, Tamil Nadu.

CERTIFICATE

HR/31/23/PW/EIE/2021/01/03

February 27, 2021

Name : J.A.MITHUN MAHAA DEVAN


Department : B.E (EIE)

Name of the Institution : Kongu Engineering College
Erode

Department in which
Undergone Project : Instrumentation

Project Title : Hydac Filter Automation

Project Duration : From 20.01.2021 To: 18.02.2021

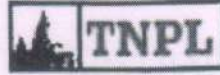

SR. MANAGER - HR

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Sr. Manager - HR

Tamilnadu Newsprint and Papers Ltd.,
Kagithapuram, Karur - 639136





Tamil Nadu Newsprint and Papers Ltd.

Kagithapuram - 639 136. Karur Dt, Tamil Nadu.

CERTIFICATE

HR/31/23/PW/EIE/2021/01/02

February 27, 2021

Name : C. BHUMESH


Department : B.E (EIE)

Name of the Institution : Kongu Engineering College
Erode

Department in which
Undergone Project : Instrumentation

Project Title : Hydac Filter Automation

Project Duration : From 20.01.2021 To: 18.02.2021


SR. MANAGER - HR

V. RAJARAM

Sr. Manager - HR

Tamilnadu Newsprint and Papers Ltd.,
Kagithapuram, Karur - 639136



DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION

SELVAM TEX

PROPREITOR: P.M.MOHANRAJ

178, PARAYAN KADU, PAPPAM PALAYAM, THINGALUR 638 055, ERODE.

Email id: selvamtex1985gmail.com Telephone : (+91) 9443294156

31.03.2021

CERTIFICATE

This is to certify that M/s,

D. RENUKADEVI (Reg.no.17EIR082)

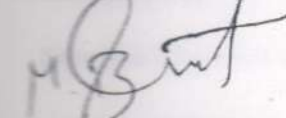
S. REVATHI (Reg.no.17EIR083)

S. RAMESH (Reg.no.17EIL117)

Final year B.E –Electronics and Instrumentation Engineering students from Kongu Engineering College, Erode-638060, have done a project in the title of “**IOT BASED COLOR DETECTION USING TCS3200 SENSOR MODULE**” from 20.02.2021 to 15.03.2021 in our organization and completed the project successfully.

We wish them all success in their academic endeavours and life

For Selyam Tex



M. BHARATH(MD)

ELGI ULTRA LIMITED

CIN: U29309TZ2017PLC029610

Regd. Office: INDIA HOUSE, 1443/1, Trichy Road, Coimbatore - 641 018, Tamilnadu, India.

Phone: +91 422 2304141 Fax: +91 422 2301377

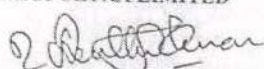
Website: www.elgiultra.com E-mail: info@elgiultra.com

31st March 2021**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Mr. ANISH AHMAD. S (17EIR005), B.E. (EIE) final year student of Kongu Engineering College at Erode, has done his academic project on "AUTOMISING THE SCREEN PRINTING PROCESS" in our organization from 15th March 2021 to 31st March 2021.

During this period his conduct and character was found to be good.

For ELGI ULTRA LIMITED


R. SENTHIL KUMAR
HEAD - HUMAN RESOURCES.



DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION
ENGINEERING
KONGU ENGINEERING COLLEGE

ELGI ULTRA LIMITED

CIN: U29309T22017PLC029610

Head Office: INDIA HOUSE, 1443/1, Trichy Road, Coimbatore - 641 018, Tamilnadu, India.

Phone: +91 422 2304141 Fax: +91 422 2301377

Website: www.elgiultra.com E-mail: info@elgiultra.com

DECLARATION

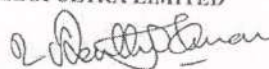
31st March 2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. ILAKKIYA. N (17EIR029), B.E. (EIE) final year student of Kongu Engineering College at Erode, has done her academic project on "AUTOMISING THE SCREEN PRINTING PROCESS" in our organization from 15th March 2021 to 31st March 2021.

During this period her conduct and character was found to be good.

For ELGI ULTRA LIMITED



R. SENTHIL KUMAR
HEAD - HUMAN RESOURCES.



September 28, 2020

Deepa A

58/3, Jai Sakthi Nagar,
Uthukuli (TK),
Tiruppur(Dt) -638812

Dear Deepa,

Sub: Your Internship offer at Trimble Information Technologies India Private Limited

We are pleased to offer you an Internship offer of 'Graduate Technical Intern' at our facility in Chennai. We would like you to begin your internship with us on **January 4, 2021** for a period of 6 months.

You will be paid consolidated fee of INR 21,000 (Indian Rupees Twenty One thousand only) per month during your internship period; subject to income Tax deduction applicable as per the Income Tax Act. You would not be eligible for any other benefits or perks during your internship period.

You will be considered for a full time employment with Trimble Information Technologies India Private Limited on successful completion of your internship, subject to your performance during the internship period and our business needs.

During your internship service with us, we would expect you not to indulge in any activity or profession, which would prove detrimental to our operations. All software products, systems developed by you during your period of service with the company will be the sole property of the company.

While performing your duties, you will come across information about the firm's business of private or confidential nature. Since such information is not for use outside the company premises or outside the purview of the operations of the company, we would trust you will not divulge such information. We also hope that you will not without explicit permission from the respective Managers take out of company premises any information, floppies, documents etc., related to the software products, systems etc., developed by you or use them for your own and personal benefit either during your services with Trimble Information Technologies India Private Limited or after cessation of your employment.

As an intern at Trimble Information Technologies India Private Limited, the code of conduct requires that you do not divulge the secrets of the company or the technical know-how for your benefit. We expect you would not under any circumstance try to start or help any other person start the activities carried on by this company.

Your internship can be terminated within 10 Business days' notice if your work performance is found to be unsatisfactory and/or you breach any of the company rules

The rules and regulations of service of the Company that are in force may be framed, amended, altered or extended from time to time. They will govern you in the same form as and when altered or amended.

By accepting this internship offer, you are obligated to adhere to our company policies pertaining but not restricted to non-disclosure, intellectual property right, Code of Conduct, work ethics and drug free work place.

You are advised to submit the following documents at the time of Joining:

- Copy of your educational Certificates (SSLC, HSc, Graduation & Post Graduation)
- Copy of all pages of your passport
- 2 Passport size latest photos
- ID proof-Pan Card

The contents of this offer and the details of fee etc. are highly confidential and therefore should be discussed only with your Manager or HR.

Please return the duplicate of this internship appointment letter duly signed by you on all pages in token of your having accepted the terms and conditions mentioned above.

For Trimble Information Technologies India Private Limited



Authorised signatory

Your internship can be terminated within 10 Business days' notice if your work performance is found to be unsatisfactory and/or you breach any of the company rules

The rules and regulations of service of the Company that are in force may be framed, amended, altered or extended from time to time. They will govern you in the same form as and when altered or amended.

By accepting this internship offer, you are obligated to adhere to our company policies pertaining but not restricted to non-disclosure, intellectual property right, Code of Conduct, work ethics and drug free work place.

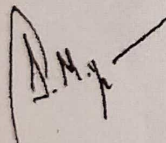
You are advised to submit the following documents at the time of Joining:

- Copy of your educational Certificates (SSLC, HSc, Graduation & Post Graduation)
- Copy of all pages of your passport
- 2 Passport size latest photos
- ID proof-Pan Card

The contents of this offer and the details of fee etc. are highly confidential and therefore should be discussed only with your Manager or HR.

Please return the duplicate of this internship appointment letter duly signed by you on all pages in token of your having accepted the terms and conditions mentioned above.

For Trimble Information Technologies India Private Limited



Authorised signatory

I accept the offer
S. Kirthika

Date: 25-November-2020

To,

Elakkya Periasamy

Copy To,

Kongu Engineering College,EIE
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, Elakky Periasamy, hereby acknowledge that the above-mentioned Internship Program, is a learning experience to enhance my continuing education.

Signed in accepted by:

INTERN

Date : _____

21 January 2021
OVIYA K
T6 – B.E / B.Tech
Kongu Engineering College

Dear OVIYA K,

Congratulations! Further to your selection under Hexaware Mavericks program and your acceptance of the offer, we are pleased to offer you a position as "Trainee" from **21 January 2021** at **Chennai** office as per the following terms and conditions. Please note that this appointment letter supersedes all earlier letter/s issued to you and as such the earlier letter/s of appointment issued to you stand cancelled.

1. An amount of INR 15000/-pm will be paid as stipend under Apprenticeship Act, 1961, for a period of up to 6 months i.e. during the classroom training. There will be no deduction of Provident Fund, Professional Tax and ESIC.
2. Post completion of the stipend period you will be paid salary as per the annexure attached and marked as Annexure "I".
3. The training period is of one year duration from the date of joining and shall comprise of classroom as well as on-the-job training. Upon completion of stipend period you will be re-designated as **Associate Software Engineer**. However, your on-the-job training would continue till you complete one year from the date of joining.
4. The continuation of your training and subsequent employment will be subject to you meeting the qualifying criteria during and at the end of the training period. Upon successful completion of training period you will be considered for an employment with the Company. For the sake of clarity the company may at its sole discretion evaluate you for permanent employment.
5. During the training period, if your performance is found to be unsatisfactory or if it does not meet the prescribed criteria, your training can be terminated by the Company without any notice or compensation. However, the Company reserves the right to terminate your services at any point in time on disciplinary grounds/ poor performance/ non-adherence to Company's rules and regulations and violation of any other terms of employment, without any notice or compensation.
6. In the event the company decides to hire you on permanent basis, provided you have successfully completed your training, the notice period for severance will be three months on either side or salary in lieu thereof. Salary for purpose of this clause means Basic Salary. However, the discretion to release you earlier than three months would be solely with the management. Notwithstanding anything contrary contained herein the notice period stated in this section is subject to any other agreement that the employee has entered into with the company whether in past, present or future, AND in the presence of such agreement, the

K. Oviya

Monica Mathai

HEXAWARE TECHNOLOGIES LTD.

Regd. office: Bldg No. 152, Millennium Business Park, Sector - III, 'A' Block, TTC Industrial Area, Mahape,
Navi Mumbai, 400710, Tel : +91 22 6791 9595, Fax : +91 22 6791 9500
(CIN) : L72900MH1992PLC069662 URL: www.hexaware.com

notice period stated in this section shall apply on completion of such other term / period / duration as agreed under any such documents / agreements.

7. In the event you are in breach of any terms and conditions of this letter or any of the applicable terms or policy as may be imposed by the company from time to time. Company may at its sole discretion terminate the training/ employment with immediate effect.
8. Your compensation is strictly confidential, and we expect that you maintain the confidentiality of the same at all times. Increments are not automatic but will be based solely on your performance as evaluated through the performance appraisal system or any other mechanism as the Company may deem fit for the purpose of deciding the same.
9. Your designation is merely indicative of the responsibilities which you are required to carry out. The Company shall be entitled to advise you, at any time, to perform any other administrative, managerial, supervisory, or other functions as per business needs and you will be bound to carry out such functions.
10. The Company may nominate you to attend trainings that might involve a considerable cost. Similarly you may be deputed to client's site to gain knowledge and utilize the same to execute projects in India/abroad. In view of this you will be expected to serve the Company, on completion of the training/knowledge transfer, for a specified period as required by the Company.
11. During the term of your employment with the Company, you agree not to undertake employment, whether full-time or part-time, as the Director/Partner/member/employee of any other organization or entity engaged in any form of business activity without the consent of Hexaware. The consent may be given subject to any terms and conditions that the Company may think fit and may be withdrawn or terminated at the sole discretion of the Company.
12. You shall at all times observe secrecy and confidentiality in respect of any technical, trade or business data or any other information that might come to your knowledge or possession, and which according to the Company are necessarily confidential, form valuable property of the Company and not made available to the trade. Further, you will not disclose such data or information without written consent from the Company to anyone other than the Company's officials who are authorized to receive the same. You will sign the "Non-Disclosure Agreement" (NDA) at the time of joining and shall abide by the terms and conditions mentioned therein.

Even after you have ceased to be in the service of the Company, the confidentiality obligations shall be perpetual and binding on you and you shall not disclose the same to anyone.

Monica Mathur

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Navi Mumbai, 400710, Tel. : +91 22 6791 9595, Fax : +91 22 6791 9500

13. You will assign to the Company the right, title and interest in any invention or improvement that you may make solely or jointly in the course of your training period and subsequent employment which may be relating to the products/services marketed, based, developed and you will perform any acts, execute such documents without expenses to you, which in the judgment of the Company, may be needful or desirable to secure to the Company patent protection and any/all rights relating to invention or improvement.
14. You shall maintain proper discipline and dignity of office and shall deal with all matters with sobriety, utmost discipline and judiciousness.
15. You shall be governed by Hexaware Code of Conduct (COC) and will be required to sign an undertaking which will be given to you separately at the time of joining. You are always requested to read and comply with the same. Any breach of COC provisions or the terms and conditions of employment may result into termination and/or an appropriate disciplinary action.
16. You shall follow the daily attendance process laid down in the Company from time to time.
17. You shall maintain and keep in your safe custody such books, registers, documents and other papers as may be issued to you or may come in your possession and shall return the same when required.
18. Due to business needs, you may be required to travel outside India. You are, therefore, advised to hold a valid passport at all times. Please submit a copy of your valid passport forthwith, if not submitted earlier. In case you do not possess a passport or if the same is no longer valid, you are required to obtain it, at your own expense, and submit to HR dept. within 45 days. You can use the TATKAL service for faster issuance of the passport. It would also be to your advantage to have a four-wheeler driving license as well.
19. As per income tax rules it is mandatory for you to submit a copy of your PAN (permanent account number) card at the time of joining. In case you do not possess it, you are required to obtain it, at your own expense, and submit to HR dept.
20. You will adhere to the dress code as laid down by the Company. You will also observe the work timings/holidays as applicable to your place of posting and as amended from time to time. Further, you should be prepared to work on any shifts, as may be warranted by the Company/client's work requirements.
21. You will inform the Company of any change in your residential address forthwith.
22. During your training period /employment terms and in the event of ceasing the services of the Company for whatsoever reason, you agree that, in addition to any other limitation during the

Monica Mathai

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term of your employment and for a period of 1 year after the termination of your employment, you will not directly or indirectly:

- (i) Solicit or accept employment with any client / customer of Hexaware or its Subsidiaries, to which you provided services as a Hexaware employee.
- (ii) On your behalf or as a partner or as an officer, director, an employee, agent or shareholder or any other entity; or person or as a trustee, fiduciary of other representative or any other person or entity.

(a) Employ, solicit the employment of, or encourage or aid any other party to employ or solicit the employment of any Hexaware employee or independent contractor.

(b) Contact any persons or companies which are customers or prospective customers of Hexaware or any of its affiliates or subsidiaries for the purpose of soliciting the customers or prospective customers in competition with Hexaware its affiliates or subsidiaries nor solicit or divert or cause anyone to solicit or divert, any such customers or prospective customers from Hexaware its subsidiaries, affiliates.

For the purpose of point No. (i) & (ii) above, Hexaware client / customer means and include any organization or person or Franchisee to which for a fee or charge, Hexaware has provided services. A prospective client / customer means a person, or another organization or person to which Hexaware has, within the twelve months period preceding such termination or separation of employment, has / has submitted a proposal to provide services, the preparation of which included your direct involvement.

23. It is agreed that it shall be open to the Company from time to time to vary any remuneration, benefit, facility or perquisite that may be extended to you.
24. Your appointment is transferable and the Company, at its discretion, may transfer you to any other department or to any place in India or outside India and as such you may, at any time, be transferred to any of the offices of the Company, its associates, organizations with whom the Company has transactions, whether the office, subsidiary, associate or organization is in existence today or is to be set-up hereafter. While every attempt will be made to give you reasonable advance notice of such transfer, in case of emergency such transfers may be made effective immediately.
 - a) You will observe working timings and holidays as applicable to your location and place of work.
 - b) On your transfer/deputation to any other place as stipulated in clause(10) you will observe the working timings and holidays as applicable to the location and place of work where you have been transferred/deputed, without any change in remuneration.
25. During your employment with the Company you will comply with the provisions of the Information Security policies, procedures and guidelines of Hexaware at all times and which shall extend beyond the normal working hours, whether inside or outside the office premises including customer site / location. Any violation will be viewed very seriously and attract strict disciplinary action.

Monica Mathur

HEXAWARE TECHNOLOGIES LTD.

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(CIN) : L72900MH1992PLC069662 URL : www.hexaware.com

26. If during the period of your employment with us you achieve any invention, process improvement, operational improvement or other processes/methods that will likely to be resulting into more efficient operation of any of the activities of the Company, the Company shall be entitled to use, utilize and exploit such improvements and you shall assign all your rights to the Company for the purpose of seeking any patent rights in respect thereof or for any other purpose.

27. Upon leaving the Company, you will not take with you any drawing, blue print or other reproduction or other data, tables, calculations, letter or other documents or any other writing or copy of writing of any nature whatsoever pertaining to the business of the Company or any of

Its subsidiaries and the same are to be handed over back to the Company, failing which the Company shall treat it as breach of the Confidentiality obligations and shall be forced to take strict action against you.

28. You warrant that you are not in breach of any contract with any third party or restricted in any way in your ability to undertake or perform the duties of your employment. During the period of this employment you shall not draw, accept or endorse any cheque or bill on behalf of the Company or, in any way, the Company's credit except so far as you may have been authorized by the Company to do so, either generally or in any particular case.

29. In the event a government body/ authority exercising its jurisdiction and statutory power/ authority seeks information pertaining to any aspect of your employment, the Company shall provide such information to the government body/authority without any notification to you. The foregoing shall be applicable to information pertaining to your employment being shared in pursuance of statutory requirements/compliance. In the event a client seeks information pertaining to business aspect of your employment (including Resume), the company shall provide such information to the client without any notification to you.

30. If you remain absent for a continuous period of 3 days without leave or obtaining your manager's approval, you will be deemed to have voluntarily abandoned your services and Company will be constrained to take necessary disciplinary action against you as per policy, your terms of employment and/or any other document.

31. Your appointment is subject to your submitting copies of mark sheets /certificates in respect of all your educational qualifications at the time of joining. You are required to submit all the mark sheets with respect to your graduation/post-graduation forthwith to the HR Dept., if same has not been submitted earlier. You should have also been declared as passed by the relevant examination authority. The determination of the adequacy or authenticity of all or any of the mark sheets/proofs in respect of your qualifications and any condonation of delay in submission of the same shall be at the discretion of the Company.

Monica Mathur

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32. Your appointment and its continuance is subject to your being found and remaining medically (physically and mentally) fit. The Company reserves the right to ask you to undergo medical examination if and when considered necessary.
33. Your appointment and its continuance is subject to you clearing verification checks at the time of joining and thereafter, which includes criminal, previous employments, educational qualifications, reference checks and all such other checks. Any discrepancy found in the above will result in immediate termination of your services.
34. Also this appointment is subject to your not being a partner or relative of a Director of the Company within the meaning of Section 314 of the Indian Companies Act, 1956. A list of Directors is available in the Head Office for perusal.
35. The age for retirement from services of the Company is 58.
36. If any information furnished by you in your application for training or during the selection process or during your joining or post joining is found at any time during your employment to be incorrect or false, and /or if you have concealed any information regarding your qualifications and experience, the Company shall have the option to terminate your services without notice or compensation.
37. At all times you will be governed by the Company's rules and regulations (and practices) as enforced from time to time on matters whether specified herein or not, including but not limited to matters such as designation, emoluments and the structure thereof, working hours, etc. and also all the published policies of the Company. Also, Company's decision on all such matters shall be final and binding on you.
38. Your employment terms may be specifically enforced legally, if required. In this connection, if any of the provisions of this contract of employment are declared or found to be void or unenforceable due to any reason whatsoever, the remaining provisions of this contract shall continue in force and effect.
39. Any dispute or difference, whatsoever, arising between you and the Company, out of or relating to the construction, meaning or operation or effect of the terms of this letter and the earlier letter dated letter shall, unless resolved amicably shall be referred to Arbitration of Sole Arbitrator to be appointed by the Company. The Sole Arbitrator appointed shall be an Authority appointed by the Company and such appointment as Sole Arbitrator shall be acceptable to you. All proceedings under such Arbitration shall be held in Mumbai and would be in accordance with the provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactments thereof. It is agreed and understood that the courts in Mumbai only and exclusively shall be competent to entertain any application or petition pertaining to the arbitration agreement and/or arbitral proceedings pursuant to this clause and no other court elsewhere shall have jurisdiction to entertain any application or petition pertaining to the arbitration agreement and/or arbitral proceedings pursuant to this clause.

Moumen M. M. M.

HEXAWARE TECHNOLOGIES LTD.

Regd. office: Bldg No. 152, Millennium Business Park, Sector - III, 'A' Block, TTC Industrial Area, Mahape, Navi Mumbai, 400710, Tel.: +91 22 6791 9595, Fax: +91 22 6791 9500
E-mail: hr@hexaware.com / info@hexaware.com / www.hexaware.com

40. The terms of this letter issued to you shall be binding for all purpose and shall at all times remain confidential and are not to be disclosed to any third party unless the matter is referred for arbitration in the circumstances mentioned above.

41. All the female employees, who will be completing minimum 80 working days with Hexaware, will be eligible for the following benefits under our Maternity Leave Policy:

- Maternity Benefit of twenty-six weeks (including all the intervening Saturdays, Sundays and Company Declared Holidays) of which not more than eight weeks shall precede the date of her expected delivery, in first two instances of childbirth.
- Maternity Benefit of twelve weeks (including all intervening Saturdays, Sundays & Company Declared Holidays), of which not more than six weeks shall precede the date of her expected delivery, for a woman having two or more than two surviving children.
- A woman who legally adopts a child below the age of three months shall be entitled to maternity benefit for a period of twelve weeks (including all intervening Saturdays, Sundays & Company Declared Holidays) from the date the child is handed over to the adopting mother.
- A woman getting a child through surrogacy shall be entitled to maternity benefit for a period of twelve weeks (including all intervening Saturdays, Sundays & Company Declared Holidays) from the date the child is handed over to her.

Please return the duplicate copy of this letter duly signed in token of acceptance of the terms and conditions of employment within seven days of you receiving this letter.

We look forward to your continued contribution and wish you all the best in your future endeavors.

With best regards,

For HEXAWARE TECHNOLOGIES LIMITED

Monica Mathur

Monica Mathur

Vice President, Recruitment-India & APAC

Monica Mathur

HEXAWARE TECHNOLOGIES LTD.

Regd. office: Bldg No. 152, Millennium Business Park, Sector - III, 'A' Block, TTC Industrial Area, Mahape,
Navi Mumbai, 400710, Tel : +91 22 6791 9595, Fax : +91 22 6791 9500
(CIN) : I 72900MH1992PLC069662 URL : www.hexaware.com

ANNEXURE I

NAME: OVIYA K	Date: 17 July 2021	
EMP No.: 55507	DOJ: 21 January 2021	
Designation: Trainee	Grade: GET	
	Monthly	Annual
Fixed components		
Basic	17,500	210,000
HRA	6,483	77,800
Statutory Bonus ¹	2,000	24,000
Gross Salary	25,983	311,800
Other Annual Benefits		
Medical Insurance premium Contribution ²		2,500
Retiral Benefits		
Provident Fund @12% of Basic	2,100	25,200
Gratuity premium contribution ³	875	10,500
Total Cost to Company		3,50,000

Notes:

1. Bonus amount will be paid monthly to comply with the Payment of Bonus Act. The final bonus amount will be computed as per the provision of the Payment of Bonus Act post the closure of the financial year (January - December) and any shortfall or excess will be adjusted accordingly.

2. You will be covered for medical insurance under the Group Hospitalization scheme of the Company.

4. You will be covered under the Gratuity Scheme of Hexaware Technologies Limited. You will be eligible to receive the benefits under this scheme, subject to a minimum of 5 years of continuous service with Hexaware

K. Oviya

Monica Mathur

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Navi Mumbai, 400710, Tel. : +91 22 6791 9595, Fax : +91 22 6791 9500
(CIN) : 172900MH1992PLC069662 URL : www.hexaware.com

ABE SEMICONDUCTOR DESIGNS, CHENNAI



TOWHOMSOEVER IT MAY CONERN

Date : 12.06.2020

This is to certify that Mr. **S.Sanjay** from **Department of Electronics and Instrumentation** from **Kongu Engineering College,Perundurai** has been selected for the Internship Position of Junior AI Software Developer (JSD-AI) to work on developing the web app for different Artificial Intelligence Project. His Internship period is 12 Months(Testing period(one month)+Intern period(11)). During the testing period, he will be tested with different tasks and performance will be evaluated for which stipend will not be considered . After the successful completion of testing period, the stipend will be INR 7,000.00 for first 6 months and it will be revised based on his performance and contributions to the projects. Moreover the company has every right to cancel the internship when the candidate fails to meet the policies of the company.

We wish him success and looking forward to meet in our forthcoming projects.

With Best regards,

A.ATHIF SHAH,Chairman

ABE Semiconductor Designs

Note : This letter is issued to only candidates who have successfully passed their testing period.

16 B/3 SUNDARBANS COMPLEX, FIRST AVENUE ASHOK NAGAR,CHENNAI-83

E-mail : abechennai@gmail.com. Ph :+914448501333

ABE SEMICONDUCTOR DESIGNS, CHENNAI



TOWHOMSOEVER IT MAY CONERN

This is to certify that Mr **Sanjai S** from **Department of Electronics and Instrumentation Engineering** of **Kongu Engineering College, Perundurai** has done his internship as Junior AI Software Developer (JSD-AI). He worked on projects namely "Smartly Care", "DRONA" and designed ABEGroups website at our concern from 01/06/2020 to 15/01/2021. During the tenure, he was sincere and hardworking towards the project. We appreciate his efforts and wishing him for his bright future.

With Best regards,

Dr A ATHIF SHAH,

Chairman / Managing Director

ABE Semiconductor Designs



EIE Placement <tapeiekec@gmail.com>

Fwd: Requesting the confirmation mail for the Internship

1 message

Thaseen S.A <thaseen2000@gmail.com>
To: tapeiekec@gmail.com

Fri, Jan 22, 2021 at 6:06 AM

----- Forwarded message -----

From: **akash murthy** <akash@euprime.org>
Date: Thu, Jan 21, 2021, 11:06 PM
Subject: Re: Requesting the confirmation mail for the Internship
To: Thaseen S.A <thaseen2000@gmail.com>

Hello Thaseen,

Accepted to the internship position at Euprime.

Euprime, No. 76, Opp Panchyajanya Apartments, Soumyashree Layout, Sharadambanagar, Jalahalli, Bengaluru 560013
www.euprime.org

On Thu, 21 Jan 2021, 22:23 Thaseen S.A, <thaseen2000@gmail.com> wrote:

Hi Akash,

I am Thaseen. Thank you so much for offering this opportunity to me! Euprime seems like a wonderful organization and after talking with you over the phone, I was excited about the possibility of working with Euprime.

I am pleased to accept the position of the video editor intern and looking forward to starting my internship on 26th or 27th of this month.

I need a confirmation email regarding the internship which I have to give to my college management to get the permission letter for this internship.

Again, thank you for accepting me for the internship role. I'm looking forward to joining the team and making a positive contribution to the company.

Regards and Thanks,

Thaseen S A
+91 97917 97180

Ref: 2021-22/EQN/INL/001

Date:21/06/2021

TO WHOM IT MAY CONCERN

This is to certify that **Mr. Vagaiarasu**, S/O Mr. Kanivalavan.A ,a student of BE (Major in Electronics and Instrumentation Engineering), Kongu Engineering College, Erode, TamilNadu has successfully completed 06 (Six) months (From 2nd January 2021 to 30th June,2021) long internship programme at this Company. During the period of his internship programme with us he was found punctual, hardworking and inquisitive.

We wish him in every success in life.

For, EQUATION CALIBRATION SERVICES PVT LTD .

Authorized Signature.





07-Feb-2021

Jagathesh T

B.Tech/B.E. Electronics and Instrumentation Engineering
Kongu Engineering College - Erode [T_TNS_KONGU]

Dear Jagathesh,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

Actual Internship dates and duration would be based on the business demand aligned skill tracks offered to you and would be shortly communicated to you.

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You will undergo a learning curriculum as per the learning track assigned to you. The learning path will include in-depth sessions, hands on exercise and project work. There will also be series of webinars, quizzes, SME interactions, mentor connects, code challenges, assessments etc. to accelerate your learning. The performance during Internship would be monitored through formal evaluations.

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You will also be required to submit the following documents at the time of reporting;

- Photocopy of your Passport & Visa

- Photocopy of your Certificates / Mark Sheets in support of your Educational Qualification(s)
- 2 Passport-size photographs
- Pan Card
- Aadhar Card
- Personal individual bank account from a nationalized bank for processing stipend

Please do not hesitate to call us for any information you may need.

We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



03-Mar-2021

Abinaya Loganathan

B.Tech/B.E. Electronics & Instrumentation Eng

Kongu Engineering College ,Erode

Dear Abinaya,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



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[Our culture](#) ▾



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01

**YOUR ONBOARDING
PROCESS**



02

POLICIES





03-Mar-2021

Bharathi K R

B.Tech/B.E. Electronics and Instrumentation Engineering
Kongu Engineering College ,Erode

Dear Bharathi,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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Please do not hesitate to call us for any information you may need.

We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:

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[Our culture](#) ▾



YOUR PATH OF JOINING



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Your joining date with Cognizant is 13 Mar 2021



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03-Mar-2021

Deepthi D V

B.Tech/B.E. Electronics & Instrumentation Eng
Kongu Engineering College ,Erode

Dear Deepthi,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



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Home

About Cognizant

Our culture





YOUR PATH OF JOINING



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Your joining date with Cognizant is 13 Mar 2021



REVIEW & ACCEPT OFFER

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BACKGROUND CHECK

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01

YOUR ONBOARDING PROCESS



02

POLICIES



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03-Mar-2021

Gopi K B

B.Tech/B.E. Electronics and Instrumentation Engineering
Kongu Engineering College ,Erode

Dear Gopi,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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Please do not hesitate to call us for any information you may need.

We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:


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[Home](#)
[About Cognizant](#)
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YOUR PATH OF JOINING

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REVIEW & ACCEPT OFFER
Completed


BACKGROUND CHECK
Completed


LEARN MORE ABOUT...

01
YOUR ONBOARDING PROCESS


02
POLICIES




03-Mar-2021

Gowthami M K

B.Tech/B.E. Electronics and Instrumentation Engineering
Kongu Engineering College ,Erode

Dear Gowthami,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



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[Our culture](#) ▾



YOUR PATH OF JOINING

Your joining date with Cognizant is **13 Mar 2021**



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03-Mar-2021

Guhan S

B.Tech/B.E. Electronics & Instrumentation Eng
Kongu Engineering College ,Erode

Dear Guhan,

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Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

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Signature:

Date:

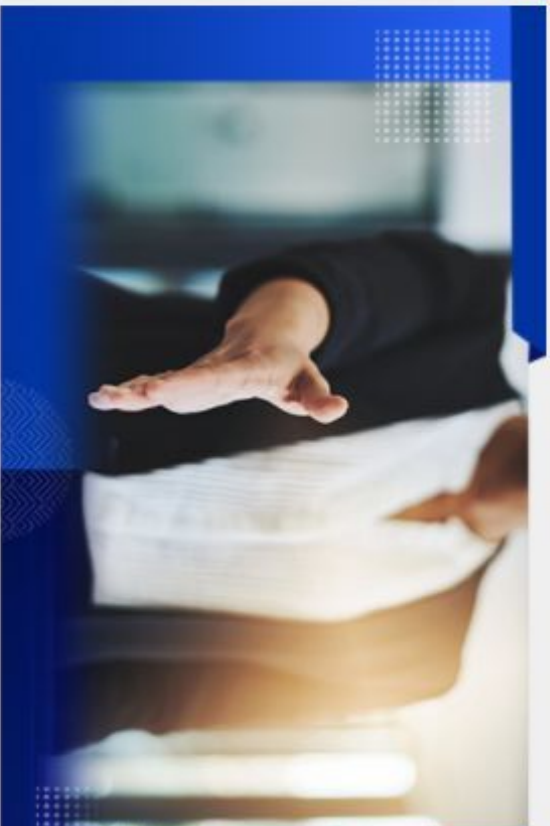
Cognizant Global Onboarding



Home

About Cognizant ▾

Our culture ▾



Welcome to
COGNIZANT



YOUR PATH OF JOINING



LEARN MORE ABOUT...

Your joining date with Cognizant is **13 Mar 2021**



REVIEW & ACCEPT OFFER

Completed



BACKGROUND CHECK

Completed

01

YOUR ONBOARDING
PROCESS

02

POLICIES





03-Mar-2021

Harine R

B.E Electronics and Instrumentation

Kongu Engineering College ,Erode

Dear Harine,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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Please do not hesitate to call us for any information you may need.

We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



YOUR PATH OF JOINING

Your joining date with Cognizant is **13 Mar 2021**



REVIEW & ACCEPT OFFER Completed



BACKGROUND CHECK InProgress



LEARN MORE ABOUT...

01

**YOUR ONBOARDING
PROCESS**



02

POLICIES





03-Mar-2021

Lokeshwaran P

B.Tech/B.E. Electronics & Instrumentation Eng

Kongu Engineering College ,Erode

Dear Lokeshwaran,

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

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Signature:

Date:

One Cognizant - The Power of ONE

onecognizantexternal.cognizant.com/?type=1


AppsYouTubeWhatsAppAI-900T00-A - Micr...AI Engineers on Mi...Microsoft Vidyapee...Email settingsMicrosoft Graph de...Introduction to AI - ...One Cognizant - Th...



NEW


Welcome : Lokeshwaran P | Logout

Onboarding




REVIEW & ACCEPT OFFER

Completed




BACKGROUND CHECK

Completed




PRE-JOINING FORMALITIES

Completed



YOUR DAY 1


Yet to Start



YOUR POC's


01

YOUR ONBOARDING PROCESS




02

POLICIES




03

LOCATIONS



04

LEARNING AND GROWTH



2 new notifications

1:40 PM
3/9/2021



03-Mar-2021

Paramasivam Gnanasekaran

B.Tech/B.E. Electronics and Instrumentation Engineering

Kongu Engineering College ,Erode

Dear Paramasivam,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



Welcome to
COGNIZANT



YOUR PATH OF JOINING

Your joining date with Cognizant is **13 Mar 2021**



REVIEW & ACCEPT OFFER

Completed



BACKGROUND CHECK

Completed



PRE-JOINING FORMALITIES

Completed



LEARN MORE ABOUT...

01

YOUR ONBOARDING
PROCESS



02

POLICIES





03-Mar-2021

Prasanth S

B.Tech/B.E. Electronics and Instrumentation Engineering
Kongu Engineering College ,Erode

Dear Prasanth,

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



YOUR PATH OF JOINING

Your joining date with Cognizant is 13 Mar 2021



REVIEW & ACCEPT OFFER Completed



BACKGROUND CHECK Completed



PRE-JOINING FORMALITIES Completed



LEARN MORE ABOUT...

01

YOUR ONBOARDING
PROCESS



02

POLICIES





03-Mar-2021

Rakesh Kumar

B.E-Com. ELECTRONICS AND INSTRUMENTATION

Kongu Engineering College ,Erode

Dear Rakesh,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:



Welcome : Rakesh Kuma

Onboarding



YOUR PATH OF JOINING

Your joining date with Cognizant is **13 Mar 2021**



REVIEW & ACCEPT OFFER Completed



BACKGROUND CHECK Completed



PRE-JOINING FORMALITIES Completed



YOUR DAY 1 Yet to Start



LEARN MORE ABOUT...

01

**YOUR ONBOARDING
PROCESS**



02

POLICIES



03

LOCATIONS



04

LEARNING





03-Mar-2021

Ramesh Vaiyapuri

B.Tech/B.E. Electronics and Instrumentation Engineering

Kongu Engineering College ,Erode

Dear Ramesh,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition





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Signature:

Date:

YOUR PATH OF JOINING

Your joining date with Cognizant is **13 Mar 2021**

-  **REVIEW & ACCEPT OFFER** Completed
-  **BACKGROUND CHECK** Completed
-  **PRE-JOINING FORMALITIES** Completed
-  **YOUR DAY 1** Yet to Start

LEARN MORE ABOUT...





03-Mar-2021

Ranjith Kumar P

B.Tech/B.E. Electronics and Instrumentation Engineering

Kongu Engineering College ,Erode

Dear Ranjith,

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For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

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Signature:

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YOUR PATH OF JOINING

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REVIEW & ACCEPT OFFER Completed



LEARN MORE ABOUT...

01

**YOUR ONBOARDING
PROCESS**

02

POLICIES





03-Mar-2021

Sakthivel Rajendran

B.Tech/B.E. Electronics & Instrumentation Eng

Kongu Engineering College ,Erode

Dear Sakthivel,

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Suresh Bethavandu

Global Head-Talent Acquisition

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Signature:

Date:





03-Mar-2021

Sanjai S

B.Tech/B.E. Electronics & Instrumentation Eng
Kongu Engineering College ,Erode

Dear Sanjai,

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- You may be required, to travel to other locations within India if there is a business need as per your internship plan
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At the time of your reporting for the internship, you will be required to sign a Non - Disclosure Agreement with the company. During the course of your Internship and after completion of the same, you are required to maintain strictest confidentiality with respect to company proprietary or products that you access or come into contact with, during your project as an Intern, at all times as per our Policy. Use of company proprietary information or products shall not be made without prior permission from the concerned authority.

You will also be required to submit the following documents at the time of reporting;

- Photocopy of your Passport & Visa

- Photocopy of your Certificates / Mark Sheets in support of your Educational Qualification(s)
- 2 Passport-size photographs
- Pan Card
- Aadhar Card
- Personal individual bank account from a nationalized bank for processing stipend

Please do not hesitate to call us for any information you may need.

We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:

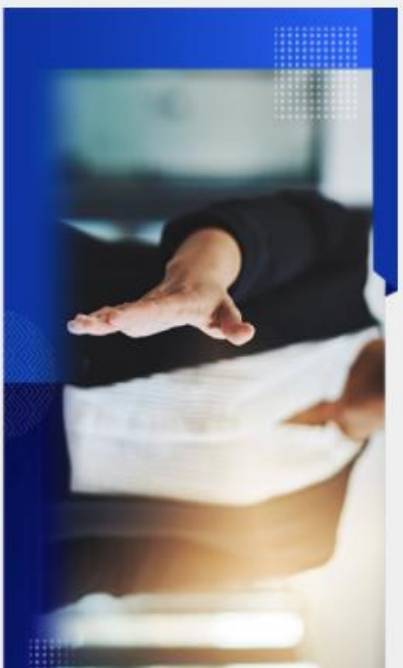
Cognizant **Global Onboarding**



[Home](#)

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Welcome to
COGNIZANT



YOUR PATH OF JOINING

Your joining date with Cognizant is 13 Mar 2021



REVIEW & ACCEPT OFFER

Completed



BACKGROUND CHECK

Completed



LEARN MORE ABOUT...

01

YOUR ONBOARDING
PROCESS



02

POLICIES





03-Mar-2021

Sindhuja Govindaraj

B.Tech/B.E. Electronics and Instrumentation Engineering

Kongu Engineering College ,Erode

Dear Sindhuja,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for a **period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

Actual Internship dates and duration would be based on the business demand aligned skill tracks offered to you and would be shortly communicated to you.

Cognizant Internship being a pre joining skill and capability development program, it would form a critical part of your employment with Cognizant.

You will undergo a learning curriculum as per the learning track assigned to you. The learning path will include in-depth sessions, hands on exercise and project work. There will also be series of webinars, quizzes, SME interactions, mentor connects, code challenges, assessments etc. to accelerate your learning. The performance during Internship would be monitored through formal evaluations.

The Cognizant Internship completion would qualify as the entry criteria to your post joining training program and would be used as basis towards your allocation to projects/roles.

Prior to joining Cognizant, you must successfully complete the prescribed Internship program. In event of non-completion of the Internship, Cognizant may at its sole discretion revoke this offer of employment.

Please also note that:

- The Internship Training will be done from Monday through Friday for 8 hours from 9 am to 6 pm (IST).
- Interns are covered under Cognizant's calendar holidays of the respective location of internship and you would need to adhere with attendance requirements. Pre-approvals are to be sought towards unavoidable leave or break requests from the program.
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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:

Onboarding



YOUR PATH OF JOINING

Your joining date with Cognizant is **13 Mar 2021**



REVIEW & ACCEPT OFFER

Completed



BACKGROUND CHECK

Completed



PRE-JOINING FORMALITIES

Completed



YOUR DAY 1

Yet to Start



LEARN MORE ABOUT...

01

**YOUR ONBOARDING
PROCESS**



02

POLICIES



03

LOCATIONS





03-Mar-2021

Vetrivel Gunasekaran

B.Tech/B.E. Electronics and Instrumentation Engineering

Kongu Engineering College ,Erode

Dear Vetrivel,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for **a period of 3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

Actual Internship dates and duration would be based on the business demand aligned skill tracks offered to you and would be shortly communicated to you.

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The Cognizant Internship completion would qualify as the entry criteria to your post joining training program and would be used as basis towards your allocation to projects/roles.

Prior to joining Cognizant, you must successfully complete the prescribed Internship program. In event of non-completion of the Internship, Cognizant may at its sole discretion revoke this offer of employment.

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We wish you good luck.

Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

I accept the terms and conditions of the offer as mentioned above.

Signature:

Date:

Welcome To C2C - sanjayguna73

One Cognizant - The Power of One

onecognizantexternal.cognizant.com/?type=1

One Cognizant
THE POWER OF ONE

Welcome : Vetrivel Gunasekaran | [Logout](#)

Onboarding

YOUR PATH OF JOINING

Your joining date with Cognizant is 13 Mar 2021

REVIEW & ACCEPT OFFER

Completed

BACKGROUND CHECK

Completed

PRE-JOINING FORMALITIES

Completed

YOUR DAY 1

Yet to Start

LEARN MORE ABOUT...

01

YOUR ONBOARDING PROCESS

02

POLICIES

03

LOCATIONS

04

LEARNING AND GROWTH

YOUR POC's

https://onecognizantexternal.cognizant.com/2/CommonPages/MyConnect.aspx#

Type here to search

ENG 12:24 09-03-2021



03-Mar-2021

Vinodha B

B.Tech/B.E. Electronics and Instrumentation Engineering
Kongu Engineering College ,Erode

Dear Vinodha,

Further to our offer for the position of Programmer Analyst Trainee and in response to your confirmation into the Internship opportunity we had extended, we are pleased to offer you an **Internship** with us for a period of **3 to 6 months**, during which you will be offered a stipend Amount of **INR 12000/-** per month based on the Internship performance and completion.

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Yours sincerely,

For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethavandu

Global Head-Talent Acquisition

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Signature:

Date:



YOUR PATH OF JOINING

Your joining date with Cognizant is **13 Mar 2021**



REVIEW & ACCEPT OFFER Completed



BACKGROUND CHECK Completed



PRE-JOINING FORMALITIES Completed



YOUR DAY 1 Yet to Start



YOUR POC's



LEARN MORE ABOUT...

01

**YOUR ONBOARDING
PROCESS**



02

POLICIES



03

LOCATIONS



04

**LEARNING
AND GROWTH**





03-Mar-2021

Vithun Jeyanesh

B.Tech/B.E. Electronics and Instrumentation Engineering

Kongu Engineering College ,Erode

Dear Vithun,

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Suresh Bethavandu

Global Head-Talent Acquisition

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YOUR PATH OF JOINING

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	REVIEW & ACCEPT OFFER	Completed
	BACKGROUND CHECK	InProgress
	PRE-JOINING FORMALITIES	Completed
	YOUR DAY 1	Yet to Start

LEARN MORE ABOUT...

01

YOUR ONBOARDING PROCESS

02

POLICIES

03

LOCATIONS

04

LEARNING