

Arming Farmers with Smart Farming: The Future of Agriculture

S. Arunmetha, K. Praghash, M Gnaneswar Reddy, S. Nirmala

Department of Electronics and Communication Engineering Koneru Lakshmaiah Education Foundation
Vaddeswaram, AP, India.

sarunmetha@kluniversity.in, prakashcospra@gmail.com, 180040588ece@gmail.com,
180040277ece@gmail.com

Abstract—

Internet of Things (IoT) innovation is currently one of the growing fields across a diversity of industries, together with agriculture. IoT enhances our lives by making and promoting developments in a wide range of actions to encourage them to become more appropriate, practicality, and enhanced using suitable man-made recognition. Smart agricultural frameworks recognize a social trade toward more helpful, lower-cost agribusiness because of this innovation. The proposed work is to use IoT in the agriculture industry to collect real-time data (soil moisture, temperature, and so on) to help one look at a few climate scenarios from afar, efficiently, and greatly increase production. A global solution for monitoring and managing the agricultural field remotely has been proposed. Implementation of a local stand-alone field control unit that includes detection and activation capabilities. Developed a cloud solution for data storage, real-time monitoring, and historical data visualization based on the ThingSpeak cloud platform. Remote managing and control functions have been realized in both the local unit and the cloud using IoT infrastructure.

Index Terms—Smart Farming, IoT, Cloud, wireless sensor network, Node MCU, Thing speak.

Engineering Ga₂O₃ phases with MIST-CVD for Gas Sensing Applications

Ashish Kumar¹, Marem Padma Praneeth¹, AlaaDdin Al-Shidaifat², Hanjung Song², and Shubhro Chakrabarty¹

¹Center for Flexible Electronics, Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, India

²Nanoscience and Engineering Department of INJE University, South Korea

Email address: kmishra.mashish@gmail.com (Ashish Kumar), praneethmarem@gmail.com (Marem Padma Praneeth), alaaddin@inje.ac.kr (AlaaDdin AlShidaifat), hjsong@inje.ac.kr (Hanjung Song), shubhro.chakrabarty87@gmail.com (Shubhro Chakrabarty)

*Corresponding author: Dr. Ashish Kumar, Email: kmishra.mashish@gmail.co

Abstract: With the utilization of UV-C radiation sterilizers on the ascension in the wake of the recent pandemic, it has become imperative to have health safety systems in place to curb the ill effects on humans. This requires detection systems with felicitous spectral replication to the “invisible to the unclad eye” radiation leaks with utmost sensitivity and swiftness. Gallium Oxide (Ga₂O₃), a semiconductor, has gained a lot of attention among researchers due to its ultra-wideband gap (4.9eV) and high critical field with a value of 8 MV/cm. It is Transparent Conductive Oxide (TCO). Ga₂O₃ has five different atomic structures of Ga₂O₃, namely, the monoclinic (β -Ga₂O₃), rhombohedral (α), defective spinel (γ), cubic (δ), and orthorhombic (ϵ) structures. Of these, the β -polymorph is selected because of band gap energy ($E_g \approx 4.7$ -4.9 eV), it is highly stable in thermal and chemical properties. In this context, the present article demonstrates the best and most suitable technique for the deposition of β -Ga₂O₃ (Gallium Oxide). This work demonstrates the layer deposition of β -Ga₂O₃ (Gallium Oxide) thin-film with MIST-CVD (Chemical Vapor Deposition) and optimization of the deposited layer to the extent of using different techniques and analyzing different plots. This deposited layer on a substrate is used for applications of gas sensors or Ultraviolet-Photodetectors (UV-PDs). This article has also demonstrated the successful application of optimized thin film for gas sensing.

MIST Chemical Vapor Deposition (MIST-CVD) is a relatively new fabrication technology used to grow oxide semiconductors. MIST CVD is a deposition method that is typically used under a vacuum to produce high-quality, high-performance solid materials [29]. MIST CVD is the process of producing non-volatile solid thin films on substrates through chemical reactions between organometallic or halide compounds to be deposited and other gases [30]. It is a CVD technique with MIST added to the Chemical Vapor Deposition process apparatus. This process of deposition is smoother than CVD. Now we must choose the best and most cost-effective technique for the deposition of the thin firm. MIST CVD outperforms other techniques in terms of efficiency and cost-effectiveness. MIST CVD for Ga₂O₃ layer deposition is being used for this purpose.

Index Terms— Ultraviolet-Photodetectors, β -Ga₂O₃, Transparent Conductive Oxide (TCO), MIST-CVD (Chemical Vapor Deposition), Ultra-wideband gap, UV-C.

DESIGN AND DEVELOPMENT OF PROSTHETIC ARM

¹Dr. M.Sujatha

Professor, Department of Electronics and Communication Engineering Department, Koneru Lakshmaiah Education Foundation, Vijayawada, Andhra Pradesh, India, sujakarhik77@kluniversity.in

Abstract

This Paper aims to design and develop a low cost and versatile human-like prosthetic arm controllable via brain activity using EEG neuro-feedback technology. The arm is equipped with a network of smart sensors and actuators that give the patient intelligent feedback about the surrounding environment and the object in contact. It also allows the arm to react and execute pre-programmed series of actions in critical cases which has extremely hot or fragile objects, etc.

This Prosthetic Arm is designed for the handicapped or Partial hand people for shoulder disarticulation. Shoulder movement is achieved by a spherical parallel manipulator, elbow movement is performed by a six-bar mechanism, and the wrist movement is implemented by a spherical parallel manipulator. This model is build using 3D printing techniques and with low-cost actuators. The functional segments presented in devices for shoulder disarticulation makes the mechanical design of the prosthetic arm. Seven degrees of freedom (DOF) is achieved by a 3-DOF shoulder, a 1-DOF elbow, and a 3- DOF wrist. The design is modelled in a serial configuration to make a human-like upper limb prosthesis, including a prosthetic hand design.

Keywords: prosthetic arm, smart sensors and actuators, EEG neuro feedback technology

Depth resolved thermal wave imaging approach for NDT & E of Different samples

Badugu Suresh¹ and B.Raja sekhar¹ · G V Subbarao

¹Infrared Imaging Center, Department of ECE, KoneruLakshmaiah Educational Foundation, Vaddeswaram, A. P, India-522502.

E-Mail.ID: sureshbadugu@kluniversity

ABSTRACT

Reliability of sub-surface defects is imperative for safer functionality of critical materials used in a wide variety of applications in various industries. The need for reliable, fast, remote, safe inspection and evaluation methods for detecting hidden defects increases in parallel with the demand for more sustainable solutions, which helps in inherent design and manufacturing specifications modifications. During in-service operations, the hidden defects are typically originated from various loading conditions leading to catastrophic failure. This work explores the best possible reliable, fast, remote, and safe inspection and evaluation experimental method and the associated post-processing approach using Infra Red Imaging (IRI) for Thermal Non-Destructive Testing and Evaluation of different materials. This proposed work provides an insight into the state-of-the-art research in the field of thermal/infrared non-destructive testing and evaluation methods and associated post processing approach to visualize the hidden subsurface defects not only resolved by spatial thermal gradients but also simultaneously provide temporal thermal gradients at the defective regions.

Brain Classification from MRI images using Deep ConvNet

Dr. E. Kiran Kumar

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India – 522302

Corresponding Author: kiraneepuri@kluniversity.in

Abstract

Medical diagnosis and treatment planning rely heavily on accurate categorization of brain tumors. Brain tumor classification is a technique for efficiently and precisely assigning a diagnosis to malignant brain tissues. Magnetic resonance imaging (MRI) is useful in the clinical diagnosis and management of gliomas. Clinical diagnosis and treatment planning rely on the capacity to accurately diagnose a brain tumor from MRI images. However, due to the massive amount of data produced by MRI, timely manual categorization is not possible. Because of this, automated approaches to categorization and segmentation are required. The geographical and anatomical diversity of brain tumors, however, makes MRI picture segmentation challenging. To classify these three types of brain tumors, we designed a unique convolutional neural network (CNN) model. The new network's simplicity was shown using contrast-enhanced T1 MRI images. Two ten-fold cross-validation processes and two datasets were used to measure the network's efficacy. The network's adaptability was evaluated using a more comprehensive picture database as part of a subject-by-subject cross-validation method. When used to record-wise cross-validation, the accuracy of this ten-fold cross-validation data set is 92.50%. The new suggested CNN architecture has the potential to be a helpful decision-support tool for radiologists because of its high speed of execution and increased generalization possibilities in medical diagnostics.

Graph Coloring Approach for wireless sensor network routing path optimization

Drarvindhan

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302
drarvindhan@kluniver

Graph coloring is a technique used in optimization problems where a graph is constructed to represent the problem, and nodes in the graph are colored in such a way that adjacent nodes have different colors. In the context of optimization, the wireless sensor network routing path can be analyzed. In this paper, we propose a combinatorial graph coloring approach with an effective network routing path adopted for the energy optimization problem. The colors represent different choices or solutions, and the goal is to find the optimal coloring that satisfies certain constraints. The results clearly indicate that the proposed approach outperforms existing methods.

Identification of forgery in speech recordings using similarities of pitch chroma and spectral flux

Kasiprasad Mannepalli¹, Swetha Danthala²

¹Associate Professor, Dept of ECE, K L Deemed to be University, Vaddeswaram, Guntur (district), Vijayawada Andhrapradesh. India.

²Research scholar, Dept of ME, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur (district), Vijayawada Andhrapradesh.

ABSTRACT

Speech forgery done by copy and moving of very short segments of speech, followed by placed up-processing operations to remove signs of the forgery, gives the forensic identification incredible challenge. In this paper, an approach with features spectral flux, Pitch chroma and tonal power ratio is proposed to identify the speech forgery. A database is prepared for the speech recordings with a positive sentence and corresponding negative sentence. Then the positive sentence is made negative sentence by forging. These recordings are used as database for the feature extraction. Dynamic time warping is done to measure that function set's similarities. By comparing the similarities with a threshold in the speech recording, one can identify the forgeries of replica-passes. The proposed approach can be very useful in detecting and finding replica-moving forgeries, even as fast as one voiced speech section on a solid speech segment. The proposed technique is also robust in resisting to several varieties of commonly used post-processing operations and noise, which highlights the hopeful accuracy of the proposed method to locate speech copy-move forgery.

Keywords: Speech forgery, Spectral features, Pitch chroma, DTW

Implementation of wireless sensor network in under water

RAMESH NVK

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

The domain of underwater wireless sensor networks (UWSNs) had received a lot of attention recently due to its significant advanced capabilities in the ocean surveillance, marine monitoring and application deployment for detecting underwater targets. However, the literature have not compiled the state-of-the-art along its direction to discover the recent advancements which were fuelled by the underwater sensor technologies. Hence, this paper offers the newest analysis on the available evidences by reviewing studies in the past five years on various aspects that support network activities and applications in UWSN virements.

Key words: underwater sensor networks; acoustic communication; ocean environment; wireless sensor networks

Review paper on various weather conditions in FSO Link

K.Sony

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: sonykarra@kluniversity.in

Abstract:

The work in this paper is describing a study that evaluates the performance of a Free Space Optical Communication System (FSOC) under different atmospheric and climatic conditions. This is an important consideration for developing reliable communication systems that can operate under different environmental conditions. These are all important metrics for evaluating the performance of a communication system. The bit rate is the number of bits transmitted per unit time, while the quality factor and bit error rate are measures of the system's ability to transmit data accurately and reliably. This is an important consideration, as the performance of a communication system can be impacted by the quality and reliability of each component. The study provides valuable insights into the performance of an FSOC system under different environmental conditions, and highlights the importance of understanding the impact of individual components on the system as a whole. The study involved testing the system under clear, very clear, and rainy conditions, and that the attenuation levels were calculated mathematically. The software used is optiwave and the tool is optisystem trail versions .

Keywords: BER, Q FACTOR

All Optical Parity Generator and Checker Based on Quantum dot Semiconductor Optical Amplifier at 200 Gb/s

Vipul Agarwal

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract- This investigation reports all optical parity generator and checker based on quantum dot semiconductor optical amplifiers at 200 Gb/s. The proposed circuit has been realized by using SOA-MZI configuration with quantum dot as active region in SOA. Parity generator consists of three inputs and utilizes 2 XOR logic while parity checker employs 3 XOR logic with 4 inputs. Cross phase modulation in SOA has been exploited in the design of XOR logic. MZI configuration converts phase modulation to amplitude modulation to achieve desired Boolean equation of XOR. Wide and clear eye diagram has been obtained with extinction ratio above 10 dB and Q factor of above 12. Obtained results validates feasibility and confirms practical implementation of proposed scheme.

Optimization of Organic Spin Valves for Room Temperature Magnetoresistance Applications

Debajitdeb

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302
debajitdeb@klunivers

The project aims to realize organic spin valve (OSV) devices to resolve the real problem of low spin valve magnetoresistance (MR) at room temperature (RT). Doping of high spin polarized magnetic electrodes and tuning of band structure alignment with organic semiconductor (OSC) will be performed to maintain high MR signal at RT. Tuning the thickness of OSC with parallel maintenance of magnetic electrode impurity penetration will also be performed for high MR signal at RT. Strong spin filtering through light illumination at magnetic-organic semiconductor interface will be achieved to get high MR response at RT. The objectives will be achieved through fabrication and characterization of multiple OSV devices with different doped/undoped magnetic electrodes and multiple OSCs with acceptable band alignment. The high MR OSV devices can be employed in realizing CMOS integrated tunnel magnetoresistance based all-electrical magnetic random access memories (MRAM) having high non-volatile nature with very low power consumption.

An Efficient Designing of IIR Filter for ECG Signal Classification Using MATLAB

npsingh

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302
npsingh@kluniversity

Abstract:

The electrocardiogram (ECG) is a biological signal that is frequently employed and plays a significant role in cardiac analysis. In analysis of important indicators of the distribution of ECG record of patient. The R wave is crucial for both analyzing abnormalities in cardiac rhythm and determining heart rate variability (HRV). In this article, a brand-new method for classifying and detecting QRS peaks in ECG data based on artificial intelligence is provided. The integration of the ECG signal data is proposed using a reduced order IIR filter design. To construct the reduced order filter, the filter coefficient is optimized using the min-max method. The main focus of this study is on removing baseline uncertainty and power line interferences from the ECG signal. According to the results, the accuracy has increased by about 13.5% in comparison to the fundamental Pan-Tompkins approach and by about 8.1% in comparison to the current IIR-filter-based categorization rules.

Keywords: ECG, Interpretation, Acquisition, HRV, Pan-Tompkins Method, min-max method.

Precise Position estimation of GPS receivers using Extended Kalman Filter

K UDAY KIRAN

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur, India-522302
Corresponding Author: uk_ece@kluniversity

Abstract:

The Global Positioning System (GPS) is a widely used navigation system in a range of applications, including aviation, nautical navigation, land surveying, and other activities that require precise positioning. However, despite its reputation as a precise positioning system, GPS measurements are subject to various sources of error, which can be categorized into three main groups: errors related to satellites, propagation, and GPS receivers.

One common approach to estimating the position of a fixed point based on pseudorange measurements from a single GPS receiver is to use an Extended Kalman Filter (EKF) and Iterative Least Square (ILS) processing. The Kalman filter is the most used method for this purpose, as it can offer optimal estimation and prediction if all the assumptions are met.

The EKF is a powerful filtering technique that works well in practice and is theoretically attractive, as it has been shown to minimize the variance of the estimation mean square error. It is particularly useful for dealing with nonlinear systems, as it can handle nonlinear functions and account for the uncertainty in measurements.

In summary, while GPS is a powerful positioning system, its accuracy is subject to several sources of error. However, the EKF is a valuable tool for estimating the position of a fixed point based on pseudorange measurements from a single GPS receiver. Its ability to handle nonlinear systems and uncertainty in measurements makes it a versatile and flexible tool for a wide range of applications.

Keywords: Extended Kalman Filter (EKF) , Global Positioning System (GPS), Iterative Least Square (ILS)

Implementation of wireless sensor network in under water

RAMESH NVK

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

The domain of underwater wireless sensor networks (UWSNs) had received a lot of attention recently due to its significant advanced capabilities in the ocean surveillance, marine monitoring and application deployment for detecting underwater targets. However, the literature have not compiled the state-of-the-art along its direction to discover the recent advancements which were fuelled by the underwater sensor technologies. Hence, this paper offers the newest analysis on the available evidences by reviewing studies in the past five years on various aspects that support network activities and applications in UWSN virements.

Key words: underwater sensor networks; acoustic communication; ocean environment; wireless sensor networks

Generation of regional Ionospheric Total Electron Content Maps using ground based GNSS observation over India

D.Venkata Ratnam¹

¹ Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur District, 522502, Andhra Pradesh, India

dvratnam@kluniversity.in

Abstract: -

In navigation range accuracy plays a major role but this accuracy degraded by ionosphere propagation errors, for improving accuracy need to estimate TEC values and correct errors properly. For this estimation we have different models in that Nequick G model is one. For low latitude India region correction of the ionospheric propagation error according to GPS coefficients is not accurate because of the large gradients and complex dynamic ionospheric behavior. In this paper, we propose a model to determine the ionospheric error by using the only 3 coefficients of NequickG In low cost, the performance of NequickG model evaluated by comparing with IRI(international reference ionosphere)2016 and ASHF models. NeQuick model is able to show day-to-day variations in the range delay corrections due to its dependence on daily values of average sun spot number. The ground based Global Positioning System (GPS) Total Electron Content (TEC) observations collected from the 26 GPS Aided GEO Augmented Navigation (GAGAN) stations over low latitude Indian region (the range of geographic longitude (65° to 100°) and geographic latitude (5° to 40°)). The accuracy of ASHF, IRI-2016 and NequickG models are evaluated over both ground and sea regions for 3 years with respect to the different forcing like the solar activity, seasons, geomagnetic disturbance etc. We have compared the results for these mentioned contrasting conditions for two main purposes to evaluate how the NequickG performs in estimating TEC over india and to have a comprehensive understanding of the quantitative improvement needed in the model to make it useful for daily predictions for navigation receivers over India.

Evaluating the Accuracy of Land Cover Classification Using Satellite Imagery

Ravi Kumar Kallakunt

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract:

Remote sensing is a powerful tool for monitoring and mapping land cover changes. In this study, we evaluated the accuracy of land cover classification using satellite imagery in a semi-arid region of West Africa. We employed a machine learning approach using Random Forest classifier to classify satellite images into four land cover classes: cropland, vegetation, bare soil, and water. The classification results were validated using ground truth data collected from field surveys. Our results show that the Random Forest classifier was able to accurately classify the satellite images, with an overall accuracy of 86%. The cropland and vegetation classes were the most accurately classified, with overall accuracies of 92% and 87%, respectively. The bare soil and water classes had lower overall accuracies of 77% and 74%, respectively. The accuracy assessment revealed that the Random Forest classifier was able to detect small patches of land cover changes. Our study demonstrates the potential of remote sensing and machine learning techniques for monitoring land cover changes in semi-arid regions. The results of this study can be used to inform land management decisions and policies in the study area.

High-performance electrochemical sensor based on Neodymium molybdate/reduced graphene oxide (Nd₂Mo₃O₁₂/RGO) for rapid detection of carcinogenic organic pollutants in water samples

Santhiyagu Sahayaraj Rex Shanlee^a, Ruspika Sundaresan^a, Shen-Ming Chen^{a,*}, Balaji Ramachandran^{b*}, Tharini Jeyapragasam^c, and Jing-Yi Peng^a, A. Irudaya Jothi^d.

^a Department of Chemical Engineering and Biotechnology, National Taipei University of Technology, No.1, Section 3, Chung-Hsiao East Road, Taipei 106, Taiwan.

^b Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Andhra Pradesh, 522302, India

^c Department of Science and Humanities, Solaimalai College of Engineering, Veerapanjan, Madurai – 625020, India.

^d Department of Chemistry, St. Joseph's College (Autonomous), Tiruchirappalli 620002, (Affiliated to Bharathidasan University, Tiruchirappalli 620024), Tamilnadu, India.

Corresponding author:

Dr. Ramachandran Balaji, email: rbalaji@kluniversity.in.

S. M. Chen, Email: smchen1957@gmail.com, smchen78@ms15.hinet.net, Tel: +886 2270 17147, Fax: +886 2270 25

Abstract:

Reasonable design, rapid, and reliable high-performance catalyst for the electrochemical sensor determination of carcinogenic photographic developing agent metol (ML) which is identified as a water and environment contaminant. This research investigation is based on the development of rare earth molybdate Nd₂Mo₃O₁₂ embedded with reduced graphene oxide, synthesized through the co-precipitation method for electrochemical sensing of ML. The highly conducting carbon-supportive substance improved the electronic conductivity of metal molybdate. The synthesized nanocomposite was thoroughly characterized by various techniques to affirm its surface morphology, topography, crystal structure, surface area, and elemental composition. Taking advantage of a huge electroactive surface area and fast electron transfer rate and strong electrocatalytic ability of NdMO, the fabricated NdMO/RGO sensor displays sensitivity for the quantitative analysis of ML. Their limit of detection (LOD) of 0.005 μM with a linear range of 0.01 – 1770 μM respectively. Beyond that, the developed sensor exhibits good catalytic activity, stability, reproducibility, and selectivity toward the detection of ML. The proposed sensor was employed for the water sample analysis and appreciable recovery results were obtained.

Keywords: Rare earth molybdate; RGO; Metol; Electrochemistry; Real-world analysis.

Implementation of vehicle accident prevention and location intimation system through SMS

Aswin Kumer S V

Associate Professor, Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, AP, India

Abstract

In today's world Vehicle Road accidents have been increasing day by day due to many reasons including rash driving, vehicle malfunctioning, driver's fault, speeding, drunk driving, etc. All these are keeping human life in danger. Despite many safety features installed in vehicles and alarming drivers regarding safe driving, road accidents have been increasing. In this view, this work particularly implemented the vehicle safety parameters to prevent accidents caused by rash driving, vehicle defects, driver defects, over speeding, etc., and to achieve accident prevention alerts to the driver and post-accident location information to a specific mobile number to save the human life at the earliest. This paper has presented a system to provide safety alerts to every individual driver regarding their driving environment and helpful in preventing road accidents by using some sensors like alcohol sensor, fire sensor, GSM module, and GPS and all these devices will be controlled with the help of ATmega328p microcontroller. This paper has provided a method of safety system to prevent road accidents to save valuable human lives.

Localization using deep learning.

Sreevardhan Cheerla

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract

Localization using deep learning is a promising technique for indoor positioning systems. In this technique, deep neural networks are used to learn the relationship between the received signal strength and the location of a target device. The deep neural networks are trained using a large dataset of RSSI values and their corresponding locations. The use of deep learning for localization has several advantages over traditional localization techniques. First, deep learning can handle complex and non-linear relationships between the RSSI values and the locations. Second, deep learning can reduce the impact of noise and interference in the RSSI measurements. Third, deep learning can improve the accuracy of localization by learning from large datasets. Several deep learning-based localization algorithms have been proposed in recent years. Some of these algorithms use convolutional neural networks (CNNs) to extract features from the RSSI values, while others use recurrent neural networks (RNNs) to model the temporal dependencies in the RSSI measurements. Hybrid models that combine CNNs and RNNs have also been proposed. Despite the advantages of deep learning-based localization, there are several challenges associated with this technique. The accuracy of deep learning-based localization is affected by factors such as the quality of the training data, the complexity of the indoor environment, and the type of deep neural network used. In conclusion, localization using deep learning is a promising technique for indoor positioning systems. Further research is needed to develop robust algorithms that can overcome the challenges associated with this technique and to improve the accuracy and reliability of deep learning-based localization.

Stability Analysis of Stochastic Delayed Dynamical Systems via Robust $L_2 - L_\infty$ CONTROL.

Karthik Chinnasamy

Department of Mathematics, Koneru Lakshmaiah Education Foundation, Guntur, India-522302

Corresponding Author: cskmathsgru@gmail.com

Abstract:

This paper lead with the robust $L_2 - L_\infty$ control for stochastic systems with time-varying delay. By applying Lyapunov-Krasovskii functional, the stability results are obtained for the proposed system in terms of linear matrix inequalities. At last, the $L_2 - L_\infty$ performance measures have been discussed numerically for the considered models.

Keywords: Stability, time-delay, $L_2 - L_\infty$ control, Stochastic delays.

Semiclassical Treatment of Interaction Between Three Level Atoms and Light

Sumit Bhushan

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: bhushan.sumit@kluniversity.in

Abstract:

Here we present a study of interaction between three level atoms and light. We have adopted the semiclassical treatment for this study in which atoms are considered as quantum mechanical entities and light is treated as an electromagnetic field. The three levels of the atoms can be in lambda, ladder, or V-type configuration. Two light fields scan the transition between these energy levels. The light whose interaction with the atoms is being studied is called the probe and the other light is called the control. This study is aimed towards developing an understanding of Electromagnetically Induced Transparency (EIT) which can be best understood as an interaction between a three level atoms and light. The intensity of control is much higher in comparison to that of probe. We have used the density matrix approach to solve the Liouville equation which describes the evolution of the system under study. We have derived the susceptibility of the medium and simulated the optical response of the medium as a function of detuning of the probe with respect to its corresponding transition and have obtained characteristic EIT plots with MATLAB. We have restricted our study to lambda type systems, but our approach is useful in studying ladder type and V-type systems as well.

Keywords: Electromagnetically Induced Transparency (EIT)

Heart Disease Prediction Based on Clinical Parameters Using Random Forest Classifier

T. Rama Krishna

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

In recent decades, heart disease has seriously threatened people's health because of its prevalence and high risk of death. Therefore, as per the recent study conducted by World Health Organisation (WHO), heart-related diseases are increasing. In this paper, we have proposed a system to predict heart disease using Random Forest model and clinical parameters based features. We have used a UCI Heart Disease dataset that consists of 14 clinical parameters to train and develop the system and map correlations of the different attributes in the dataset. The testing has been done on KL dataset. The Results showed that Random Forest-based classifier found to be more accurate than other state-of-the-art models in this context.

A Novel Idea Using Smart Antennas to Enhance Wireless Communications

SALEEM AKRAM PATAN

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract:

In wireless communication, a broadcast server serves a number of clients. The exchange of information from server and access by the clients takes place in a cyclic path using the directional antennas. But directional antennas have several drawbacks. So the multiple directional antennas were used to replace the fixed directional antenna systems. When using the multiple antennas we need to consider the geographical distribution of the clients over coverage area of system to get the desired improved performance. All these disadvantages motivate us to develop a technique named as a wireless push system developed using adaptive smart antenna with rescheduling application to be used at broadcasting server. Smart antennas can vary the beam widths according to client position using suitable algorithms. Beam width of the antenna is changed as per the changing position of the client and appropriate changes are introduced in the broadcasting schedules. This approach will bring the desired improvement in system performance.

Fuzzy logic-controlled Buck converter

Arjuna Muduli

2Dept. of ECE, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh, India Mail id, arjunamuduli@gmail.com

Abstract:

A Fuzzy logic controlled (FLC) buck converter is proposed here. In this technique, for regulating buck converters, fuzzy controller algorithm is designed, and the converter's performance is implemented in MATLAB for a model with a 30 KHz switching frequency and a 20W output power. The evaluation of the output has been verified for different input voltage and load conditions. This converter has the advantages like better transient response, and less overshoot to achieve desired output voltage.

Keywords: Fuzzy Logic Controller (FLC), Buck converter. Closed loop control, DC/DC converter

Design and Qualitative Performance Analysis of High-K Dielectric HEMT Bucky

Balaji

Department of Electronics and Communication Engineering, Koneru lakshmaiah Education Foundation, Vaddeswaram, Guntur - 522302

Abstract:

We have designed and simulated a 5-nanometer regime gate Nanowire High Electron Mobility Transistor (HEMT) with an undoped region (UR) under the gate with high-k dielectric material being hafnium oxide (HfO_2). The thickness of the gate and undoped regions are equal but the length of the channel is not equal. The proposed Undoped under the gate dielectric Nanowire HEMT reduces the maximum electric field (V) in the channel region and increases the drain current significantly. The High-K dielectric Nanowire HEMT structure obtained a saturated Ion current of 60% higher than the conventional structure. For High critical Power and High-frequency Power transmission Amplifiers utilizes the AlGaN/GaN/SiC-based HEMT with an undoped region under the gate with High-K dielectric material as HfO_2 . The Proposed advanced HEMT Produces a higher Drain current (I_d), 54% high transconductance (G_m) with Low On-Resistance (R_{on}), and High conductivity in comparison to typical HEMT. In Addition to these improved characteristics, the Electric field along the Y direction is also observed. The Nanowire HEMT structure gives advanced performance attainments than the further material analyzed. Nanomaterial Oxide HEMT formed by Low-k Dielectric materials in the process of Silicon Dioxide as SiO_2 and High-k dielectric materials such as Titanium Dioxide (TiO_2) and Hafnium Oxide (HfO_2) created more opportunities in Power electronics and radio frequency VLSI areas.

Keywords: HEMT, SiO_2 , HfO_2 Transconductance, Silvaco TCAD.

IoT enabled uniforms for army personnel

Abhishek

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

The Indian army is a branch that is completely land based and it can be considered as a huge component of the Indian army. It will be advantageous for the safety of our country and whether acquire them with much better equipment of the advanced technology. In this research paper, we have discussed the tracking system of the particular army man with the GPS and we also be able to look after the health conditions such as pulse rate, heart beat and the temperature of the body. The calculated values will be transferred to the base station with the help of WiFi module or GSM module to consider the conditions of the army personnel. If the soldiers were injured in the war or in any other kind of counter strike the fluctuations with the pulse and the heartbeat rate will be calculated and will inform the base station of the military via WiFi module and from the GPS we can locate the injured soldiers. From the data we can strategize the future plan regarding war with the very actual number of the not really injured soldiers and also we can acquire the much needed medication for the injured one with the location acquired by the GPS. The system that we have proposed will be containing of jackets, sensors and transmission module which are fixed inside the jacket for the communication between the soldier and the control board or between one soldier to another soldier. We can observe the massive technological growth in the field of internet of things provides a noticeably high flexibility and heterogeneity of the resource pool over the clients and over the network could easily ruined the several resources that are highly on demand.

Design and Analysis of 8x8 SRAM Memory Array using 45nm Technology at 100MHz

M Ravi Kumar

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur, India-522302

Corresponding Author: ravikumar@kluniversity.in

Abstract: The regular demand for higher storage space with less power and less area has been the driving force for the development in this field, especially in random-access memories (RAMs), since they offer higher read and write speeds than other types of memories, Among the most common RAM types are the static RAMs (SRAMs) and dynamic RAMs (DRAMs). In the proposed system, the 6T SRAM architecture is used, even though SRAMs usually require larger area and are more expensive than DRAMs, they are much faster, compatible with CMOS technology, and don't require periodic-refreshing circuits to keep its data while power supply is ON.

The novelty of this paper is that we have optimized the parameters like area, average power dissipation, Read-Write operation speed and delay of 8x8 SRAM Array that can be operated at frequency of 100MHz and with a power supply of 1V. In this paper, we have discussed the low power SRAM cell design, focusing on the low power steady read and write operations while using various peripheral circuits for cache memory. The high transistor density, higher leakage currents, and rise in interconnect parasitic become significant factors as technology advances. By using the right techniques, the electricity usage can be reduced.

Keywords: SRAM, DRAM, Power dissipation

Application of Advanced Statistical Signal Processing Algorithms as Diagnostic Tool for Prognostic Studies of Earthquakes using Ultra Low Frequency (ULF) Geomagnetic Signals

K.S.Ramesh

Professor, Department of ECE, KLEF, dr.ramesh@kluiniversity.in

Abstract:

Earthquake precursors have no definite prognostic values till now. Owing to a lack of statistical reliability analysis of precursors and their validity of their assessment against natural time variability and background variations, the problem of decisive detection and precise prediction of earthquake remain unsolved. Ultra Low Frequency (ULF) being a promising candidate for earthquake precursors because of its larger skin depth. The inherent stochastic nature of ULF and its measurements show significant spatial and temporal variations during an earthquake event. The proposed project is envisaged, to investigate the reliability of earthquake precursors in ULF geomagnetic anomalies using advanced statistical signal processing algorithms. The observed ULF data from different stations is initially subjected to pre-processing through removal of outliers, filling the missing data and conversion of non-Gaussian noise into Gaussian noise using Unscented Kalman Filter or Particle (Monte Carlo) Filter. Further, sliding time window process is carried out by Normalized Squared Innovation Process (NSIP) for detection of abnormalities in ULF data. As this process is recursive, a decision will be made using Chi-squared distribution. Ultimately, the above procedure is useful in designing and deployment of early warning systems to detect earthquake precursors in ULF geomagnetic anomalies for precise forecasting of earthquakes. To Investigate the existence of Ultra Low frequency (ULF) signals around 0.01 Hz in geomagnetic anomalies associated with earthquakes. To implement the advanced statistical signal processing algorithms on ULF geomagnetic signals for isolation of earthquake precursors. To identify possible precursors for prognostic study of earthquake facilitating to develop early warning systems.

Keywords: Earthquake Precursors, Ultra Low Frequency, Statistical Signal Processing Algorithms

RF MEMS Switch Optimization Using Linear Vector Quantization Network

G V Ganesh

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: ganeshgorla_ece@kluniversity.in

This research describes the optimisation of linear vector quantization network-based artificial neural network (ANN)-based radio frequency (RF) micro-electro-mechanical system (MEMS) technology switches. For cantilever structure-based RF MEMS switches, we have developed a train dataset based on a literature survey and test datasets based on FEM simulation. Different approaches, such as Bayesian regularisation and extracted performance indices, are used to train the dataset.

Keywords: linear vector quantization network, artificial neural network, radio frequency (RF) micro-electro-mechanical system, FEM simulation

RF MEMS Switch Optimization Using Linear Vector Quantization Network

G V Ganesh

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: ganeshgorla_ece@kluniversity.in

This research describes the optimisation of linear vector quantization network-based artificial neural network (ANN)-based radio frequency (RF) micro-electro-mechanical system (MEMS) technology switches. For cantilever structure-based RF MEMS switches, we have developed a train dataset based on a literature survey and test datasets based on FEM simulation. Different approaches, such as Bayesian regularisation and extracted performance indices, are used to train the dataset.

Development of ML-based Integrated Water Vapor forecasting using GPS and meteorological attributes

M. Sridhar

Professor, Department of ECE, Koneru Lakshmaiah Education Foundation, Vaddeswaram

Abstract:

Prediction of integrated water vapor (IWV) is crucial for various meteorological applications, including weather forecasting, climate modeling, and hydrological studies. The traditional approach for IWV prediction relies on physical models that require a significant amount of computational resources and suffer from inaccuracies due to approximations and simplifications. As a result, machine learning (ML) algorithms have emerged as a promising alternative for IWV prediction, leveraging the availability of large amounts of observational data. In this study, we propose a ML-based approach for IWV prediction using GPS and meteorological parameters as inputs. Specifically, we use a combination of convolutional neural networks (CNNs) and recurrent neural networks (RNNs) to capture the spatial and temporal correlations in the input data. The CNN extracts the spatial features from GPS data, while the RNN models the temporal dynamics of both GPS and meteorological data.

We evaluate our approach using a dataset consisting of GPS and meteorological measurements collected at multiple stations over a period of two years. Our results demonstrate that the proposed model achieves significantly better performance compared to traditional physical models and other state-of-the-art ML models. Moreover, our model can provide accurate predictions in real-time, making it suitable for operational applications. In conclusion, the proposed ML-based approach shows great potential for IWV prediction, providing accurate and efficient predictions using readily available GPS and meteorological data. This approach can be extended to other meteorological applications, paving the way for further advancements in the field of weather and climate modeling.

Execution analysis of brain tumor detection and classification from MRI images using machine learning technology

Syed.Shameem

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: shameemsyed@kluniversity

Abstract:

Detecting brain tumors precisely in the early stages of clinical imaging applications through magnetic resonance imaging (MRI) is a challenging task for scientists nowadays. Detecting an increase in tumors early can reduce the death rate from mental disease-related deaths. Although MRI is a popular clinical imaging modality due to its low ionization and radiation, manual assessment of the MRI images is time-consuming. In this paper, we propose a Machine-Learning-Technique (MLT) that uses the MRI dataset of the cerebrum to categorize and discriminate between tumorous and non-tumorous regions. The proposed method involves the chan-veese (C-V) technique, which partitions the dynamic growth by selecting a precise starting point. The cancer region's elements are then extracted using the gray level co-event network (GLCM), and significant statistical features are picked. Finally, a two-class classifier is implemented using the support vector machine (SVM), and its performance is validated with the k nearest neighbor (KNN). To evaluate the proposed framework's performance, we tested it on the BRATS 2017 benchmark dataset in terms of accuracy, sensitivity, specificity, and precision. The simulation results reveal that the proposed system performs better than the existing methods, with high accuracy.

Keywords: MLT, chan-veese, GLSM Brain tumor,, SVM

Telegram Bot for Home Automation through Face Recognition Technology

SUBBA REDDY VASIPALL

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract:

The integration of face recognition technology and home automation systems has revolutionized the way we interact with our homes. In this project, we propose the use of a Telegram bot to control and monitor home automation devices using face recognition technology.

The system works by capturing an image of the user's face, which is then compared to a database of registered faces. If the face is recognized, the Telegram bot sends a message to the user's device, giving them access to their home automation system. Once authenticated, the user can issue commands such as turning on the lights, adjusting the temperature, or unlocking the doors, among others.

The Telegram bot provides a user-friendly interface for controlling home automation devices, with the added benefit of facial recognition for security. The system can be easily customized to suit the user's specific needs and can be integrated with other smart home technologies.

Dual-Band Slot Patch Antenna for Wireless Communications

Ketavath Kumar Naik

Department of Electronics and Communication Engineering, Antenna Research Laboratory, KLEF
deemed to be University, Vaddeswaram, Guntur, AP, India.

Email ID: drkumarkn@gmail.com

The investigation of two half circular patch (HCP) antenna with defected ground structure to operate dual bands is presented in this study for wireless communications. The crescent slots etched on the HCPs are proposed to operate the dual bands of below -10 dB reflection coefficient, with the impedance bandwidth of the first band being 740 MHz (3.01–3.75 GHz) and of the second band being 7120 MHz (6.74–13.86 GHz). The proposed HCP antenna was resonates of 3.36 and 12.17 GHz with -33.9 and -35.47 dB reflection coefficients. This antenna produces a maximum gain of 5.46 and 6.61 dB for these resonating frequencies, respectively. The simulation and measured radiation pattern results are also presented for proposed HCP antenna and it operates for wireless communications and internet of things applications.

Design, Fabrication and Prototype of RF Filters for Smart Phones Using Compact SAW Devices on Silicon.

GOLLAPUDI SAI KRISHN

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Surface acoustic wave (SAW) filters are the essential components in RF front-end modules of a cellular phones, smart phones, Wi-Fi, and other wireless communication systems. Recent developments in mobile communication demands large bandwidth and high data rates, which are feasible with the inclusion of RF filters having characteristics of extremely compact in size, low insertion loss, high out of band rejection ratio, temperature coefficient of frequency (TCF), and must be suitable for monolithic integration and fabrication reproducibility. In general, radio frequency (RF) SAW filters comprises of multiple interconnected SAW resonators to perform desired electronic filtering operation. Conventionally, these SAW resonators are realized on single crystal piezoelectric substrates with large grating electrodes on both sides of interdigital transducers (IDT) for the transduction of surface waves. However, the grating structure consumes significant area of substrate and making RF SAW filters to occupy large chip area, which is very crucial in realizing compact RF front-end modules. Till date, conventional SAW RF filters are the only technology that caters the demands of current cellular and smart phone communication standards. However, the existing RF SAW filters on conventional piezoelectric substrates offer meagre compatibility with CMOS fabrication process for monolithic integration. It is proposed to design, fabrication and prototyping of compact and high-performance SAW RF filters on silicon substrate for mobile and smart phone communication standards. Very compact SAW resonators without reflector grating can be realized using the total reflection property of shear horizontal surface acoustic wave (SH-SAW). Thin piezoelectric films that support the excitation of SH-SAW will be employed on silicon substrate for the realization of proposed SAW RF filters.

Piezoelectric thin films like ZnO and AlN in conjunction with IDT will be used for the transduction of SH-SAW. The total reflection of SH-SAW will be achieved by the free edges of the device. As a result, a plinth will be created and on top of it IDTs will be patterned using conventional metallization techniques, followed by thin film deposition for the transduction of SH-SAW. This compact SAW resonator on silicon will be the first of its kind to realize SAW RF filters suitable for monolithic integration. The performance of proposed filters will be evaluated based on primary characteristics, such as insertion loss, out of band rejection ratio, effective coupling coefficient and temperature coefficient. The RF filters will be designed for current 4G LTE and futuristic 5G communication standards. After prototype design of proposed filters, the same will be fabricated along with CMOS circuit to demonstrate the viability of monolithic integration and bulk manufacturing.

CARRY SAVE ADDER USING PSEUDO-NMOS LOGIC

J Lakshmi Prasanna

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: lakshmiprsannanewmail@kluniversity.in

Abstract:

This work aims to design and simulate a 4-bit carry select adder using pseudo NMOS logic in Cadence at the 45nm technology node. The proposed design consists of two 2-bit adders, a multiplexer, and a carry lookahead generator. The adders and the multiplexer are implemented using pseudo NMOS logic to achieve low-power consumption and high-speed performance.

The carry lookahead generator uses CMOS logic to reduce delay and improve performance. The proposed design is simulated using Cadence Virtuoso and the results show that the design is operating correctly and meets the design specifications. The power consumption is measured to be 1.038mW with a delay of 2.023ns. The proposed design is suitable for use in low-power and high-speed applications, such as portable devices and digital signal processing systems.

Keywords: Cadence, CMOS logic, carry select adder, pseudo NMOS

IoT Based UPS Parameter Monitoring and Controlling using GSM

A V Prabu¹

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: prabu.deva@kluniversity

Abstract:

The paper focuses on UPS parameter monitoring and controlling using IoT Technologies and GSM Module. The approach is to design intelligent UPS monitoring and controlling without manual interactions. Here the concept of machine to machine and machine to mobile communication is the key role by adopting most effective wireless communication. GSM based UPS monitoring and controlling systems helps to increase production efficiency of industrial used UPS in remotely controlling the entire industry which results increases the profit of the company with less manpower. In addition, it provides SMS alerts in case of emergency to chief engineers, maintenance engineer and other decision taking authority. The proposed approach is divided into two main parts like manager and agent module. Manager plays role of networking operated system application that runs on a server and agent is operating system service which runs on each UPS.

Keywords: GSM, IOT, UPS and M2M.

Design of Chopper Instrumentation Amplifier for Implantable Devices

Ernest Ravindran R S

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract

The use of Bio-Implantable Medical Devices (BIMDs) is growing phenomenally due to their sophistication in medical applications. In these applications the sensing of physiological signals plays a key role. The present paper was planned as a challenge for the noise-free signal sensing architecture. This could be happened with the Instrumentation amplifier. This article offers a low-power chopper-based instrumentation amplifier based on low noise. At a power supply of 0.9 V, the chopper-instrumentation amplifier (CIA) consumes just 0.24 μ W. The gain of the proposed CIA is 44 dB while the bandwidth of 0.1 Hz to 110 Hz. The total input referred noise is about 1.1 μ V_{rms} from a bandwidth of 0.005 to 100 Hz. Circuits simulated by the tanner-tool/mentor graphics using 90nm CMOS standard technology.

Keywords: Bio-Implantable Medical Devices (BIMDs), Chopper Instrumentation Amplifier (CIA), Instrumentation Amplifier, Chopper Amplifier, Low Power & Noise.

Implementation of Real Time Moving Object Detection Using Region-Based Fully CNN

K V Sowmya

Koneru Lakshmaiah Education Foundation, Guntur, India-522302

Abstract

Vision systems are essential in building a mobile robot that will complete a certain task like navigation, surveillance, and explosive ordnance disposal (EOD). This will make the robot controller or the operator aware what is in the environment and perform the next tasks. With the recent advancement in deep neural networks in image processing, classifying and detecting the object accurately is now possible. In this paper, Convolutional Neural Networks (CNN) is used to detect objects in the environment. Two state of the art models are compared for object detection, Single Shot Multi-Box Detector (SSD) with MobileNetV1 and a Faster Region-based Convolutional Neural Network (Faster-RCNN) with InceptionV2. Result shows that one model is ideal for real-time application because of speed and the other can be used for more accurate object detection.

Compact High Gain Microstrip Patch Series fed Antenna Array

Lakshman Pappula

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: Lakshman.pappula@kluniversity.com

The paper describes a multi-polarization series-fed antenna operating at 10 GHz. The patch elements are constructed using eccentric rings, which enable circular polarization. The dual-port feeding allows for switching between the polarization modes, including right-hand circular polarization (RHCP), left-hand circular polarization (LHCP), and linear polarization (LP). The antenna's polarization can be changed without using switch controlling. The circular array arrangement results in a compact structure. The antenna exhibits multi-polarization and traveling-wave series-fed performance with axial ratios lower than 3dB measured. The $|S_{21}|$ is lower than -14 dB in the mentioned bandwidth. Then designed and simulated a 4×4 MIMO array with a compact structure, which was processed and measured. The experimental and simulation results showed good agreement.

Keywords: Compact, High gain, Non-periodic microstrip superstrate

Recognition of Counterfeit Currency using Discrete Wavelet Transform

Prabakaran N

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: prabakaran@kluniversity.com

Abstract :--

Counterfeit notes are one of the major issues in money transactions. In a growing country like India, it is becoming a big problem for the economy. As the advances in printing and scanning technologies are developing, it is very easy for any person to print counterfeit notes with the use of the latest hardware machines. Identifying counterfeit notes in a manual way takes a lot of time and manpower. Hence there is a requirement for automation techniques to use the counterfeit currency recognition process effectively. Many methods have been proposed and implemented with MATLAB. By using the Discrete cosine transform (DCT) algorithm blocks of the image are represented by coefficients of DCT. So, the presence of blocking artifacts in DCT is a drawback of this method. Hence, we have implemented a counterfeit note detection unit with a different algorithm that uses discrete wavelet transform (DWT) in MATLAB. This paper is another attempt on the same project to better solve the counterfeit currency problem.

Keywords: Counterfeit notes, Algorithm, MATLAB, Problem, DCT, DWT.

FPGA based efficient thermal imaging analysis for biomedical signal processing

M Lakshmana Kumar

Koneru Lakshmaiah Education Foundation, Guntur, India-522302

Abstract

Field Programmable Gate Arrays (FPGAs) have been widely used in various applications due to their high performance, low power consumption, and programmable nature. In recent years, thermal imaging has become an important tool in biomedical applications, allowing non-invasive detection and diagnosis of various diseases. In this paper, we present an FPGA-based thermal imaging system that can be used in biomedical applications. The proposed system consists of a thermal imaging camera, an FPGA, and a computer. The thermal imaging camera is used to capture thermal images of the target area, which are then processed by the FPGA. The FPGA is programmed to implement image processing algorithms such as noise reduction, contrast enhancement, and feature extraction. The processed images are then transmitted to the computer for display and analysis. One of the challenges in implementing an FPGA-based thermal imaging system is the design of the image processing algorithms. The algorithms need to be optimized for the FPGA architecture, which requires a thorough understanding of the hardware constraints and programming languages. Additionally, the thermal imaging camera needs to be calibrated to ensure accurate temperature measurements. Calibration involves using a reference object with a known temperature to adjust the camera settings. The proposed FPGA-based thermal imaging system has the potential to revolutionize biomedical applications by providing a non-invasive, real-time, and customizable imaging solution. The system can be used for disease detection and diagnosis, physiological monitoring, and drug discovery. The challenges in designing and implementing the system can be overcome with careful consideration of the hardware constraints and programming languages. With further research and development, the FPGA-based thermal imaging system can become a valuable tool in the field of biomedical engineering.

Keywords: FPGA, Biomedical, noninvasive

CARRY SKIP ADDER USING PSEUDO NMOS LOGIC

Chella Santhosh

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302
Corresponding Author: csanthosh@kluniversity.in

Abstract:

Adders are considered as the critical block in multipliers and other digital circuits. By improving the performance of the adder block, the overall system performance can be improved. Through this paper a correlative analysis of several adders like Carry Save Adder (CSaA), Carry Select Adder (CSeA), Carry Skip Adder (CSA), Ripple Carry Adder (RCA), Carry Look ahead Adder (CLA) designed and analyzed using Verilog HDL code. The performance metrics consider for comparison are area and delay. From the analysis performed, Carry Skip Adder has been concluded to be the better-performing one. The efficient full adder structure at the transistor level is identified namely 6T, 10T, 26T, and 24T. The identified transistor-level full adders are implemented in different block structures of 16 bit Carry skip adders to meet the better performing one. Simulation results show 4block CSA using 6T full adder is 37% efficient in the matter of delay and 4block CSA using 10T full adder is 35% efficient in the matter of power implemented using using pseudo nmos logic Pseudo-NMOS logic has the advantage of higher speed than static CMOS logic, especially in large fan-in NOR gates. This is since there is only one PMOS transistor contributing for the output rise time.

Keywords: Carry Select Adder (CSeA), Carry Skip Adder (CSA), Ripple Carry Adder (RCA)

A Highly Improved Surface Plasmon Resonance Based Biosensor Using Tungsten Disulfide-Graphene Hybrid Structure

Yesudasu Vasimalla

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur, India-522302

Corresponding Author: vasimalladasu@kluniversity.com

Abstract:

This paper explores the performance improvement of surface plasmon resonance (SPR) sensor for biomolecular interaction using tungsten disulfide (WS_2) and graphene hybrid structure. The proposed structure is designed on basis of Kretschmann configuration that is comprised of bilayer of aluminum-copper metal film, which are used to excite the surface plasmons on the prism's surface. Transfer matrix method is exploited for analyzing the sensor's performance by plotting reflectance responses using the angular interrogation. The analysis is confirmed that the maximum achieved sensitivity of the proposed sensor is 300 deg/RIU. Moreover, the comparison study has been carried out at end, resulting that the proposed sensor is accomplished better performance compared to existing sensors. Finally, field distributions of the proposed sensor is shown by using the opti-FDTD software.

Keywords: Biosensor, transfer matrix method, surface plasmon resonance, graphene, tungsten disulfide.

STUDY AND PERFORMANCE OF CASCADED MULTILEVEL INVERTERS FOR HIGH POWER APPLICATIONS

S. Koteswara Rao

Professor, Department of ECE, KLEF

Y. Lalitha Kameswari

Research Associate, Department of ECE, KLEF

Abstract-

Electricity had become most essential part in our life such that we cannot survive without electricity even for a minute. So generally, an equipment known as Inverter is commonly used in our household applications when there is a failure in supply to convert DC which is stored in the battery and into AC for the utilization of load appliances. The Inverters place a major role to provide the quality of the power. Unless we provide the Quality of power to the load, the load will not work properly otherwise the components and bearings of the load will get damaged. To overcome this problem multilevel inverters are used now-a-days in many industrial applications as a substitute for medium and high voltage applications. This paper projects the work regarding the evaluation of performance of various Cascade H-Bridge multilevel inverters (CHB-MLI) with their harmonic analysis. Now a days Power electronic devices are placing a major role in industrial as well as house hold applications. As an alternative to the high power applications MLI are placing a prominent role. With the use of MLI, the stresses in the system as well as in the motor bearings will get reduced. The MATLAB based simulation on platform of SIMULINK is offered for CHB-MLI topology of 1- ϕ for 7, 11 as well as 13-levels. Comparison Chart was given in detail for CHB-MLI are presented in the paper based on Cost, Switches as well as Total Harmonic Distortion.

Estimation of display device parameters on 10OBA pure and with Au nanoparticles for LCD applications

P. Pardhasaradhi¹, M. Tejaswi², B.T.P. Madhav¹, RKNR Manepalli³

¹Antennas and Liquid Crystals Research Center, Department of ECE,
Koneru Lakshmaiah Education Foundation, Vaddeswaram-522502, India

²Department of Physics, Mallareddy institute of technology for women, Hyderabad

³Department of Physics, Andhra University, Visakhapatnam, India

Abstract

In this present article synthesis, characterization, and study of display device parameters through image analysis has been carried out on 10OBA pure Liquid crystal (LC) and 10OBA with the dispersion of 50 μ l Au nanoparticles towards the display device applications. Textural determinations of the synthesized compounds are recorded by using POM connected with a hot stage and camera. DSC (Differential Scanning Calorimetry) is used to measure enthalpy and transition temperature values. Due to the dispersion of nanoparticles clearing temperature of the compound is slightly reduced but there is no specific change in the nematic phase exhibited by pure 10OBA. Further characterization is carried out by various spectroscopic techniques like Ultraviolet-Visible (UV-Vis) spectroscopy, Scanning Electron Microscopy (SEM), and X-ray Diffraction (XRD). The textures of 10OBA pure LC and 10OBA with the dispersion of 50 μ l Au nanoparticles have been considered for the computation of display device parameters viz., Luminance, Luminance uniformity, Luminance coefficient, and Contrast ratio. These parameters have been measured from the intensity values of textures as a function of temperature.

Keywords: Ultraviolet-Visible (UV-Vis) spectroscopy, Scanning Electron Microscopy (SEM) and X-ray Diffraction (XRD), Display device parameters, Luminance, Luminance uniformity, Luminance coefficient, Contrast ratio.

UPS PARAMETER MONITORING AND CONTROLLING USING IOT AND GSM

ANNANGUDI VLU PRABH

Koneru Lakshmaiah Education Foundation, Vaddeswaram-522502, India

Abstract:

The paper mainly focus on presenting a economical and elementary approach to design an intelligent UPS monitoring and controlling system , adopting the concept of mobile to machine and machine to mobile communication is one of the most effective wireless communication (GSM) is one of the part must effective wireless communication that can be utilized easily. GSM based UPS monitoring and controlling system helps to increase production efficiency of industrial ups in a remotely controlling the network. In addition to monitoring a system using SMS it provides additional facilities which include report generation, maintaining the log in data base. Proposed system is divided in two Modules such as manager & agent. Manager is networked operating system application that runs on a server & agent is operating system service which runs on each UPS.

Keywords: GSM, IOT, UPS and M2M.

LANE FOLLOWING ROBOT AND OBSTACLE AVOIDING WITH CAMERA MONITORING

Dr Rooban S

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract

This paper is based on a practical approach to design a prototype Robotic vehicle by using Arduino programming. This relationship forces integrated circuit (IC) designers to sacrifice the error severity of logic locking to increase its attack resilience and vice versa. We proceed by exploring the consequences of this tradeoff through architectural simulations of ICs incorporating locking sweeping over the derived parametric space. We find that the efficacy of logic locking is severely limited by this tradeoff. In response, we propose trace logic locking (TLL), a novel enhancement of module level logic locking which enables existing art to secure arbitrary length sequences of input minterms, referred to as traces. Doing so injects an additional degree of freedom into the parametric space of locking, enabling locking techniques to overcome the limitations of our derived tradeoff. We both theoretically and empirically prove this by using TLL to enhance cutting edge locking.

Key words: Robotic vehicle, IR sensors, led lights, Arduino, camera Esp32 CAM.

Non Linear Frequency Modulated Thermal Wave Imaging using Auto Encoder

G T Veesala and V S Ghali

Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education
Foundation, Guntur, India-522302

Corresponding Author: gvs0raos@gmail.com

Abstract:

The current trend in active infrared thermography is enhanced and automatic flaw identification using machine learning-based processing approaches. While several supervised and unsupervised learning models have been used to address automatic defect identification, adversarial training methods are becoming more popular for improving defect signatures. In order to improve defect signatures through dimensionality reduction and to automatically detect defects using an unsupervised learning method, this research offers a deep auto encoder for quadratic frequency modulated thermography. The heat response of a glass fiber-reinforced polymer specimen with flat-bottom hole flaws at various depths and sizes is used to experimentally validate the suggested methodology. The proposed auto encoder is a suitable online substitute for the usual dimensionality reduction and defect enhancement approach and unsupervised learning model employing thermographic and machine learning measures.

Keywords— Auto encoder, Automatic defect detection, Quadratic frequency modulated thermography.

Deep Human Pose Recognition: A Wavelet Attention CNN.

Kishore

koneru lakshmaiah education foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302

Abstract:

Human Pose Recognition from 2D video sequences is extremely challenging under the influence of recording artifacts such as lighting, sensor motion, human body movement and many more. In this work, the objective is to recognise human body pose from independently sourced online videos of an Indian classical dance form ,Bharatnatyam. To overcome unbalanced attention and induce human-like attention, this work proposes to balance attention through a wavelet multi resolution model across the entire backbone network. This will enable the model to focus the distribution of features on the randomly scaled human dancer within a class label as the video recordings are independently sourced from a real world dance performance. The results show the highest possible accuracy on the dance dataset due to multi resolution attention across the entire network.