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

Message from the Vice-Chancellor

Greetings!

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

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

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

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Dr M Srinivas Reddy
Director, IcfaiTech

Message from the Director

Greetings!

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

The Internship Programs are a unique feature of education at IcfaiTech and helps to produce more practical oriented and innovative graduates. Dedicated faculty members from our institute and executives from industry supervise the student performance and assess them during internship program. IcfaiTechoffers courses like Principles of Economics, Principles of Management, Dynamics of Social Change and Introductory Psychology to develop a well-rounded personality to students admitted into all integrated first degree programs. This proactive approach has earned us respect from employers, educationists and professional institutions. I invite all the aspirants to seek admission into the IcfaiTech Programs and become technology-driven professionals.

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Dr A.Vadivel
Dean, IcfaiTech

Message from the Dean

Greetings!

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

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

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

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

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Department of Electronics & Communication Engineering (ECE)

Table of Contents

11	Design Analysis of Voltage Controlled Oscillator in 22nm FinFET Technology *Dr. P Akhendra Kumar*	11
12	Design and implementation of Optical Encryption Decryption System Based on Optical XOR logic *Vipul Agrwal*	12
13	A Bayesian Framework for Decision-Making in Power Systems *Dr. Soumitha Ghosh*	13
14	Interference Mitigation in radar signals Using Ensemble Classifier *N.Durga Indira, Dr.M.Venu Gopala Rao*	14
15	Capturing Uncertainties in Phasor Measurement Unit Reliability using Fuzzy Theory *Dr. Soumitha Ghosh*	15
16	Design and Analysis of Solar Photovoltaic Panel condition Monitoring Smart System *Arunmetha S, P Kanakaraja, Aravindhan M, R. Sekhar, K. Suresh Kumar and K.Praghash*	16
17	Design optimization of CMOS Low Noise Amplifier (LNA) using Grey Wolf Optimization in 90nm Technology *Dr. P Akhendra Kumar*	17
18	Estimation and Detection of Shadow Confidence Maps in Fetal Ultrasound Imaging using Machine learning Approach *R. prasad*	18
19	On-chip air-core Fractal Micro Transformers in 180nmTechnology *Dr. P Akhendra Kumar*	19
20	Detection of Counterfeit Currency using Discrete Wavelet Transform in MATLAB *N. Prabakaran*	20
21	Investigation of Negative Capacitance and Memory Parameters in Hfo2 Based Ferroelectric Materials. *Dr. Rajesh Kumar Jha*	21
22	Skeletal based human action rection using deep learning algorithms. *E. Kiran Kumar*	22

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Home Automation Using Packet Tracer Technique

Saleem Akram Pathan
Assistant Professor, Ece Dept., Aditya Institute Of Technology And Management, Srikakulam, Ap, India

Abstract : The technology has been growing from day to day in human life. The necessity for the development of technology is to lead human life comfortably. The basic need of human to lead his/her life comfortably is a home. A home with updated latest technology which means a smart home. This paper gives the basic idea use cisco packet tracer to implement smart home. One is needed to create a smart home when electronic devices are switched on and off. Smart home development is achieved by simulation via testing system, network setup and wireless home gateway computer network equipment required by a smart home network cisco packet tracer using Internet Thing (IoT)/IoE command. The software chosen for the simulations is Cisco Packet Tracer, the tool's main strength is to offer a variety of network components that represent a real network, and then interconnect and configure devices to create a network. Cisco implemented (IoT) functionalities in the latest version of the platform, and now it is possible to add all the smart devices, sensors, actuators and also devices, which simulate microcontrollers like Arduino or Raspberry Pi to the network. All IoT devices can be run on generic programs or modified by Java, Python or Blocky programming them. This makes Cisco Packet Tracer a perfect method to construct functional simulations for IoT. Index Terms : Internet of Everything, Smart home, packer tracer tool, sensors.

Keywords: MEMS, sensor, Home, automation

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Enhancement of Passivated Emitter Rear Solar Cell Efficiency by Using ZrO_2 as Passivation Layer

Dr. Rajesh Kumar Jha
Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education, Hyderabad,501203

Abstract:

In this work, we have used ZrO_2 as a rear side passivation layer for monocrystalline solar cells. First of all the conventional Aluminum back surface field, (Al-BSF) solar cell has been fabricated and then by using plasma-enhanced atomic layer deposition technique, ZrO_2 has been deposited to make it passivated emitter rear solar cell(PERC). The efficiency of PERC type solar cell is enhanced by 0.86% from the conventional solar cell i.e. without the introduction of the rear side passivation layer. Surface passivation properties of ZrO_2 has been explored by measuring minority carrier lifetime and surface charge density at ZrO_2/Si interface. The substrate temperature, annealing temperature, annealing time have a serious impact on surface passivation properties. The thickness and other process parameters of ZrO_2 were optimised before using it for the rear side passivation layer. The open-circuit voltage is 0.68 V in comparison to 0.59 for Al-BSF solar cells.

Keywords: PERC, Al-BSF, ZrO_2, passivation, efficiency

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Improvement in Antenna Operating Frequency by Using Metasurfaces

Saleem Akram Pathan

Assistant Professor, ECE Dept CMR College Of Engineering & Technology, Hyderabad - 501 401 AP India

Abstract— Metasurfaces can produce various outcomes when used in the antenna applications. Especially they can allow selected band of frequencies while neglecting others due to this property they are used as filters some time these structures are also used in designing the amplifiers as they can strengthen the signal if the design of metasurface is made with the same band as antenna. Based on this we will design a metasurface and place it as the ground plane and while varying the dimensions of the metasurfaces we will study how it will change the operating frequencies of the antenna. A microstrip patch antenna is considered for the analysis purpose which will generally operates at 3.39GHz. and also the metasurface structure will be designed with air filled and dielectric filled by varying its metallic patch size and the height of pin and the changes occurs in the antenna performance will be studied and illustrated.

Keywords—Metasurfaces, patch antenna, dielectric substrate, tuning.

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Effect of La doping on the ferroelectric properties of $Bi_4Ta_3O_{12}$

Dr. Rajesh Kumar Jha
Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract:

In this article, we have investigated the effect of 'La' doping in the conventional ferroelectric $Bi_4Ta_3O_{12}$. We have fabricated Metal/Ferroelectric/Metal (MFM) and Metal/Ferroelectric/Silicon (MFS) structures by using $Bi_4Ta_3O_{12}$ and La-doped $Bi_4Ta_3O_{12}$ as a ferroelectric layer. The deposition parameters and thickness of ferroelectric film have been optimized before the fabrication of the actual device. The x-ray diffraction technique is used to find the phase structure and crystallinity of the ferroelectric layer. Field emission scanning electron microscopy with energy dispersive spectroscopy technique is used to study the surface morphology and concentration of different elements in ferroelectric layer. The electrical and ferroelectric characterization has been carried out to obtain, CV, IV remnant polarization(Pr), endurance and data retention time of the fabricated MFM device structure. The La doped $Bi_4Ta_3O_{12}$ has provided better results like Pr($5uC/cm^2$), endurance(10^6 read/write) and data retention time of 10 hours.

Keywords: $Bi_4Ta_3O_{12}$, Ferroelectric, Remnant polarization(Pr), Endurance, Data retention time

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Design of 16 bit MIPS Microprocessor using Verilog hardware descriptive language.

Dr. Rajesh Kumar Jha
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract

This paper presents the design and analysis of a high-performance five-stage pipelined 16-bit microprocessor without Interlocked Pipeline Stages (MIPS) which is based on Reduced Instruction Set Computer (RISC) architecture. MIPS applications are mainly found in Embedded systems, Microprocessors and Microcontrollers. The main objective is to create the design and analyse MIPS based processors using Verilog code. It also emphasizes on the key points of designing field i.e., bearing fewer transistors count and proportionally have greater performance infact creating more chip area to fabricate more peripherals on a System-On-Chip. MIPS also finds its great support in providing small scale applications. In single-cycle implementations all operations take the same amount of time whereas in pipelined
implementation the processor overlaps and decides the execution time in each operation. To achieve MIPS modelling, Verilog serves as a compact language to build actual hardware modelling.

Keywords: Instruction Set, Processor Speed, Arithmetic Logic Unit (ALU), Register and Program Counter.

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Design and Analysis of Tunnel Field Effect Transistor for Future Applications

B. Balaji
Department of Electronics and Communication Engineering, , St Martin's Engineering College, Hyderabad - 500014 India

Tunnel Field Effect Transistor (TFET) has become one of the promising devices to be part of Integrated circuits as the technology advances to nano scale. A TFET has many advantages over a conventional Metal Oxide Semiconductor Field Effect Transistor (MOSFET) which includes lower Sub-threshold Swing (SS<60mv/dec) , lower leakage current, Higher ON current to OFF current ratio. The device TFET is found to be more immune to temperature variations and has less effect on device performance due to its mechanism of working i.e. Band to Band Tunneling process. One of the distinct characteristic of TFET is its ambiolar behavior which makes the device work under positive and also negative polarity of gate bias. This makes TFET differ from all other semiconductor devices. Various architectures of TFET have found their applications in areas like biosensing, analog circuits like amplifier and digital circuits like flip-flops, MUX and memory elements.

Keywords: Integrated Circuit, TFET, Sub-threshold Swing, Band to Band Tunneling, Ambipolar

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Petri Net-Based Risk and Reliability Analysis of Power System Protection

Dr. Soumitha Ghosh
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract:

The power system protection plays a decisive role in defending the power system from damages that might be incurred due to faults by fault identification, isolation and clearance. We aim to perform a reliability analysis of power system protection. We are particularly focussing upon a transmission line equipped with a phasor measurement unit (PMU)-based auto-recloser. The Petri net (PN) model would be used to exemplify the qualitative performance measures of the protection system model through behavioural properties such as conservativeness, reachability, properness, safeness, and boundedness. After developing the PN based reliability models of the system, we would perform the risk and reliability analysis of the protection system under study.

Keywords: Power system protection, Petri nets, Reliability analysis

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Design and Simulation of Single Frequency GNSS ionospheric correction models for Navigation Applications

D Venkata Ratnam
Department of Electronics and Communication Engineering, , St Martin's Engineering College, Hyderabad - 500014 India Email: dvratnam87@gmail.com

Abstract

NAVigation with Indian Constellation (NAVIC) is the operational name given to the Indian Regional Navigation Satellite System (IRNSS) developed by the Indian Space Research Organization (ISRO), India. The most influential factor is ionospheric gradients that can degrade the positional accuracy of Global Navigation Satellite System (GNSS) users especially in low-latitude regions. The main aim of this paper is to estimate the ionospheric gradient variations obtained from the NAVIC receiver located at Guntur, India (16.230 N, 80.440 E). Code and carrier phase measurements of S-band (2492.028 MHz) signals are used to derive ionospheric time delays and Total Electron Content (TEC) values. The ionosphere is perceived to be the major source of ranging error for Global Navigation Satellite System (GNSS) users. The traditional use of Klobuchar ionospheric model coefficients is not suitable for equator / low latitude regions. In this paper, a technique is proposed to facilitate regional single-frequency ionospheric delay corrections based on the Adjusted Spherical Harmonic Function model (ASHF) by introducing fewer coefficients into the algorithm. The ASHF ionospheric correction is drivenwith low-resolution harmonics with order $\leq$ 2 ($\leq$9coefficients),and performance is compared with Spherical Harmonic Function and Klobuchar models. Preliminary results reveal that the low- resolution ASHF model enhanced the ionospheric time delay corrections by 12.98%.The results could be useful in the context of ionospheric time delay modeling for regional navigation satellite systems using a single frequency GPS receiver such as Navigation Indian Constellation (NAVIC).In this report, S-band signals of NAVIC are used for first time to investigate ionospheric gradients over low-latitude region. The Recursive Least Squares (RLS) algorithm is implemented as a single frequency ionospheric model for estimating the absolute TEC, longitudinal (E-W) and latitudinal (N-S) ionospheric gradients. Ionospheric gradient analysis has been carried for three consecutive days during September equinox, December solstice in the year 2016 and for a geomagnetic disturbed event observed during May 2017. The annual statistical analysis in the periodic structure of spatial ionospheric gradients from NAVIC S-band signals during June 2016 to May 2017 is also discussed. It is evident that RLS model can estimate ionospheric gradients for a single NAVIC station. In this paper, we report a NAVIC DCB estimation algorithm, which was implemented with a Modified planar fit-based local ionospheric model. TEC data were recorded at the same location by the NAVIC as well as the Global Positioning System (GPS) receiver (KL University, Guntur, India,16.470N, 80.610E). The DCBs of NAVIC satellites and receiver were determined. Results indicated large DCB values of-0.61 ns for NAVIC PRN3. The estimated DCB receiver bias was -0.30 ns. The outcome of this work would be immensely is useful for improving positional accuracy of GNSS and NAVIC systems.

Keywords: GNSS, NAVIC, ionosphere, Total Electron Content.

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Monitoring of hazardous Gas leakage using IoT technique

Dr. Rajesh Kumar Jha
Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract:

In this work, we have proposed a model which can detect leakage of all the gases and their leakage source. The source of gas leakage detection has been done using IoT techniques and related sensors. The microcontroller-based gas leakage detection unit is made with the help of various hardware like Arduino UNO, Sim 800 GSM Module, MQ-5 sensor, Buzzer, e.tc.

The two main modules i.e. the detection and transmission module and also the receiver module are used. The hazardous gases were sensed and the related information was displayed on the LCD. If these gases exceed the conventional level, an alarm is raised and an email is also sent to the authorized person through the web. The advantage of this automatic gas leakage detection technique is that it offers quick reaction time and accurate detection. Thus this method helps to stay informed about gas leakages by providing dangerous positions of the gas leakage via a web page.

Keywords: IoT, hazardous Gas, hazardous Gas, Alarm, LCD display

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Cross Terms In Quadratic Transforms Reduction And Implementation On Fpga

B Murali Krishna1

Department of Electronics and Communication Engineering, Vidya Vikas Institute Of Technology, Hyderabad - 501503 India

Abstract

In this paper an efficient VLSI architecture is designed to reduce the cross terms effect in quadratic time frequency transforms. Quadratic transform namely Wigner Ville Distribution (WVD) produces efficient energy localization in time frequency representation (TFR) plane by performing auto correlation operation between input signal and shifted version of the signal itself. Due to nonlinear nature of WVD, suffers from cross term energy localization in TFR plane when the input signal contains more than one multi frequency components. A pair of multiplexer and complementary subtractor (MUX-CS) logic elements are introduced at the stage of Fast Fourier transform (FFT) to avoid cross terms in WVD. The proposed architecture is implemented using 64 point FFT butterfly structure. The design is carried out in Verilog code and implemented on Spartan-6 FPGA. A comparative analysis of hardware utilization factors such as frequency, LUT, Flip Flops, and Slices for proposed method and existed methods are presented. The proposed MUX-CS-WVD architecture is tested with a standard chirp signal with maximum instantaneous frequency of 10Hz with 500 frames per second. The implemented method produces 2.36ms elapsed time, utilizes 12% of memory logical blocks. Further for better interpretation of proposed methodology, ECG data is taken and analyzed for accurate time frequency applications.

Keywords: Wigner Ville Distribution (WVD); Fast Fourier Transform (FFT); Cross terms; Chirp signal; ECG signal.

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Design Analysis of Voltage Controlled Oscillator in 22nm FinFET Technology

Dr. P Akhendra Kumar
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract: In this paper, FinFET based Voltage controlled oscillator is analyzed and compared using cadence virtuoso in 22nm technology node. FinFET's are promising substitutes for CMOS Digital circuits to avoid short channel effects. For comparison purposes, centre frequency and frequency-voltage (f-V) characteristics are considered. These figures of merits are analyzed under different process variations to determine the worse case performance of VCO.

Keywords: *Voltage Controlled Oscillator (VCO), Fin field Effect Transistor (FinFET), Process Variation.*

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Design and implementation of Optical Encryption Decryption System Based on Optical XOR logic

Vipul Agrwal,

Department of Electronics and Communication Engineering Chaitanya Bharathi Institute Of Technology, Hyderabad - 500090 India

In this research paper Optical encryption and decryption system has been successfully demonstrated by using cross-gain modulation (XGM) in semiconductor optical amplifiers (SOAs). In this paper it is also demonstrated that it is impossible for eavesdropper to decrypt the signal without having information about keys used in the encryption side. XOR logic designed using SOA has been simulated at data rate of 80 Gb/s. The overall quality factor of optical encryption and decryption signal is 12 and 11 and eye-opening factor is obtained as .92 for encryption signal and .89 for decryption signal. Our design is mainly based on SOA-Mach-Zehender interferometer structure, optical couplers,

Keywords: FPGA,CW light & EDFA.

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A Bayesian Framework for Decision-Making in Power Systems

Dr. Soumit Ghosh
Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract:

During cascading faults in power systems, the entire system crashes within a span of a few seconds. To check widespread losses and devastation due to faults, apt actions and accurate decision-making by the operators are crucial in this situation of emergency. A tool that can inform us about the power system component status when a fault occurs will aid the process of blocking the cascading fault or events triggered as a result of a fault. A Bayesian network is capable of providing us with the required mathematical groundwork that can be used for taking conclusive actions. We aim to develop a Bayesian framework by utilizing its ability to update the system component probability based on the status of the system. By updating the status of power system components based on power system working conditions we will be able to make better decisions, thus avoiding vast spread loss of the system economically and geographically.

Keywords: Power systems, Bayesian networks, cascading faults, decision-making

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Interference Mitigation in radar signals Using Ensemble Classifier

N.Durga Indira1, Dr.M.Venu Gopala Rao

Department of Electronics and Communication Engineering, Vignana Bharathi Institute Of Technology, Hyderabad - 501301 India

Abstract

In automotive systems, radar is a main component of autonomous driving. By using transmit and reflected radar signal by a target, we can track the target range and velocity. When interference signals exist, noise increases and it affects the detectability of target objects. For these reasons, previous studies have been proposed to cancel interference or reconstruct original signals. However, the conventional signal processing methods for canceling the interference or reconstructing the transmit signals are difficult tasks, and also have many restrictions. In this work, we propose a novel approach to mitigate interference using deep learning. The proposed method provides high performance in various interference conditions and has low processing time. Moreover, we show that our proposed method achieves better performance compared to existing signal processing methods.

Keywords: autonomous driving, automotive, radar, interference, mitigation, deep learning

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Capturing Uncertainties in Phasor Measurement Unit Reliability Using Fuzzy Theory

Dr. Soumitha Ghosh
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

Uncertainty is inevitable in real-life systems. To address these uncertainties fuzzy theory has been developed. The fuzzy theory is capable of mimicking human logic, and thus addresses any ambiguity in the data thereby providing the best possible solution for a given situation. Current research is aimed at analysing the uncertainties in the phasor measurement units (PMUs) and the effect of these uncertainties on the power system functioning using fuzzy logic. The uncertainty in PMU is present in the form of ambiguous reliability parameters that are required for performing reliability studies of the device.

Keywords: Uncertainty, fuzzy logic, phasor measurement unit

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Design and Analysis of Solar Photovoltaic Panel condition Monitoring Smart System

Arunmetha S, P Kanakaraja, Aravindhan M, R. Sekhar, K. Suresh Kumar and K.Praghash

Department of Electronics and Communication Engineering, Vignana Bharathi Institute Of Technology, Hyderabad - 501301 India

Abstract

Renewable and green energy sources are need of the hour and are gaining much consideration then other conventional sources for generation of electrical energy. Amongst these renewables, electricity generation through solar energy plays a pivotal role. Solar photovoltaic energy is the emerging and enticing clean technologies with zero carbon emission in today's world. Power efficiency delivered from a PV panel individually or as larger system. To harness the solar power generation is indeed necessary to pay serious attention to its maintenance as well as application. The IoT based solar energy monitoring system is proposed to collect and analyzes the solar energy parameters to predict the performance for ensuring stable power generation. The solution is designed as a laboratory prototype that could be extended to monitor large scale photovoltaic stations using simple devices, this solution made it possible to measure the current, voltage, power, and visualize remote energy yields and its performance either on the computer or through smart phones. The prime target of PV monitoring system is to offer a cost-effective solution also provides an alert to a remote user, when there is a deviation of solar power generation quality parameters from the predefined set of standard values. The solar panel performance monitoring system purpose is collecting data automatically in a range of time. The result can be analyzed to measure the solar power supply performance in the sensor node. Solar panel performance monitoring system consists of 3 main blocks which are client, server, and communication. The client consists of sensors, RTC, local display, microcontroller, and backup data logger. The server consists of PC, and communication block (Xbee transmitter and receiver).

Key words—Power Efficiency, Shading, PV Solar, Irradiance, Solar Farm.

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Design optimization of CMOS Low Noise Amplifier (LNA) using Grey Wolf Optimization in 90nm Technology

Dr. P Akhendra Kumar
Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:
This paper presents a Grey Wolf based methodology for CMOS Low Noise Amplifier with common-source inductive degeneration to obtain optimal design parameters by minimizing the noise figure in 90nm technology. The optimal design parameters such as gain, noise figure and channel width of transistor from Grey Wolf optimization algorithm are validated by comparing them with numerical simulations using Agilent's Advanced Design Systems (ADS) software.

Keywords: Noise Figure; Gain; S-parameters; GWO; Low Noise Amplifier

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Estimation and Detection of Shadow Confidence Maps in Fetal Ultrasound Imaging using Machine learning Approach

R. prasad
ECE Department, Mahatma Gandhi Institute Of Technology, Hyderabad - 500 075 India

Abstract:

Many clinical and engineering applications require the detection of acoustic shadows in ultrasound images. Real-time feedback of acoustic shadows can direct sonographers to a standardised diagnostic viewing plane with minimal artefacts and provide additional data for other automatic image analysis algorithms. However, automatically detecting shadow regions using learning-based algorithms is difficult due to the subjective nature of pixel-wise ground truth annotation of acoustic shadows. We present a weakly supervised approach for automatically estimating the confidence of acoustic shadow areas in this study. A dense shadow-focused confidence map may be generated using our technique. Based on global image-level annotations as well as a modest number of coarse pixel-wise shadow annotations, a shadow-seg module is constructed in our technique to learn generic shadow features for shadow segmentation. The resultant binary shadow segmentation is extended to a reference confidence map using a transfer function. In addition, to learn the mapping between input images and reference confidence maps, a confidence estimation network is proposed. During inference, this network can predict shadow confidence maps directly from input pictures. To test the success of our technique, we utilise evaluation measures like as DICE, inter-class correlation, and so on. Our technique is more consistent than human annotation and exceeds the state-of-the-art in shadow segmentation and confidence estimate of shadow areas statistically and qualitatively. We also show how our technique may be used in tasks like ultrasound image classification, multi-view picture fusion, and automated biometric assessments by including shadow confidence maps into them.

Index terms: Ultrasound imaging, deep learning, weakly supervised, shadow detection, confidence estimation.

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On-chip air-core Fractal Micro Transformers in 180nmTechnology

Dr. P Akhendra Kumar

Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

On-chip Components plays a vital role in many RF communications systems. This paper provides an in-depth analysis of such a component called on-chip transformers. Fractal transformers have the unique property of space filling for any given designated area. This enables them to have an advantage over traditional spiral transformers because they can fit more features into the same space. As a result, they have higher quality factors and higher values of inductance. In addition, they can stretch in length up to infinity with each iteration of the curve. The paper aims to compare the performances of three fractal curve transformers namely, Hilbert Fractal Transformer, Sierpinski Fractal Transformer and Moore Fractal Transformer in terms of the critical performance parameters to characterize on-chip transformers, such as the *Q*-factor, coupling factor (*k*), resonance frequency (f_{SR}). The fractal transformers discussed and implemented in this paper are planar and coreless. The primary and secondary coils consist of only one metal layer with no crossovers. The Quality factor of the Hilbert transformer was found to be the highest from the simulation results since it is less effected by the parasitics compared with the existing transformers in the literature.

Keywords: *on-chip transformer, Q-factor, self-resonance frequency* (f_{SR}), *Fractal geometry, RFIC, LNA, 5Gcommunication*

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Detection of Counterfeit Currency using Discrete Wavelet Transform in MATLAB

N. Prabakaran
ECE Department, Mahatma Gandhi Institute Of Technology, Hyderabad - 500 075 India

Abstract :--Counterfeit notes are one of the major issue in money transactions. In a growing country like India, it is becoming 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 use of latest hardware machines. Identifying counterfeit notes in manual way takes a lot of time and manpower. Hence there is requirement of automation technique using which the counterfeit currency recognition process can be done effectively. Many methods have been proposed and implemented with MATLAB. By using Discrete cosine transform (DCT) algorithm blocks of the image are represented by coefficients of DCT. So, due to the presence of blocking articrafts in DCT, it is a drawback for this method. Hence, We have implemented a counterfeit note detection unit with a different algorithm which uses discrete wavelet transform (DWT) in MATLAB. This paper is another attempt on the same project to give a better solution for counterfeit currency problem.

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

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Investigation of Negative Capacitance and Memory Parameters in HfO2 Based Ferroelectric Materials

Dr. Rajesh Kumar Jha
Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract

In this proposed work, first, the modelling, simulation and fabrication of ferroelectric random access memory will be undertaken. The negative capacitance and various other ferroelectric memory parameters (such as remnant polarization, coercive voltage, memory window, leakage current density, data retention time, endurance and breakdown voltage) will be investigated in HfO_2-based high-k dielectric material. The TCAD simulations allow us to observe the characteristics of negative capacitance devices, which exhibit subthreshold swing less than 60 mV/decade and other interesting properties such as negative output resistance and drain induced barrier rising (DIBL).

Keywords: HfO_2, Ferroelectric, Pulsed Laser Deposition, Ferroelectric Field Effect Transistor, Negative Capacitance, Data Retention Time.

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Skeletal based human action rection using deep learning algorithms.

E. Kiran Kumar

Department of Electronics and Communication Engineering Chaitanya Bharathi Institute Of Technology, Hyderabad - 500090 India

From the last decade action recognition is most active research topic in the computer vision or activity detection field which helps us to train the machine to do the work in any field instead of human which reduces the time being and human effort and cost efficient. The most used technique's in the activity recognition are deep learning, optical flow in the advancement in technology several tools are developed by respectable firms for more enhancement of the perception of human behavior, several of them Kinect, 3d data visualizer which data gathering from such systems and data analysis vary from one another, in this report we use Kinect dependent 3 data streams which has 3d view and gathers data in 3 forms of skeletal, RGB and Depth.

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Investigation of Negative Capacitance and Memory Parameters in 2D Van Der Waals heterostructure based Ferroelectric Materials

Dr. Rajesh Kumar Jha
Department of Electronics and communication Engineering,
IcfaiTech (Faculty of Science and technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract

Recent advances in 2D materials have opened a new era for its promising applications in the field of electronics. Unique properties of 2D materials with no limitation of finite size and stable characteristics at low dimension, precisely even at atomic layer thickness have enables the fabrication of high performance and high-density structures. The charge and heat transport are confined within a plane of 2D materials which make it possible to fabricate scaled structures according to Moore's law. Transition metal dichalcogenides (TMDs), Hexagonal Boron Nitride (h-BN), MXenes, Xenes and organic materials are the wide category of discovered 2D materials.

Keywords: 2D Material, Ferroelectric, logic in memory, Memory computing

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Simulation and Fabrication of Micro Gas Sensors for Detection of Acetone

Joshitha C1*, K.Teja Venkata Reddy2

Department of Electronics and Communication Engineering Chaitanya Bharathi Institute Of Technology, Hyderabad - 500090 India

Abstract: The Metal Oxide Semiconductor sensor has the ability to detect volatile organic compound gases in human exhaled breath as a result of metabolic processes and to calculate diabetes levels in a non-invasive manner. In comparison to non-diabetic people, diabetic people have peak acetone levels in their exhaled air. One can measure the degree of diabetes by calculating the concentration of acetone in a volatile organic compound. Using COMSOL Multiphysics software, we were able to model and simulate an acetone-based SnO2 gas sensor by solving Poisson's equations under related boundary conditions of mass, heat, and electrical transitions. An exposure model adopted to show the necessary acetone, a heat transfer model used to determine the reaction temperature, and an electric model implemented to complete the simulation. As SnO2 is n-type sensing layer, it is sensitive to reduction gas and it requires some amount of temperature. The heater is developed in meander shape to produce required temperature of 3500°C - 3800°C to sensing element. when the senor is exposed to oxygen(air)O2 in chamber at 3800°C approximately. The sensor is immersed in acetone, or in the same state. On a lower consecration of acetone (10 mole/m3), the voltage was found to be applied to the electrodes. The voltage around the electrodes goes up as the acetone content rises.

Keywords : Potential tool; Non-invasive; Diabetes; MOS sensors; Acetone

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Real-Time Implementation of Speech Quality Improvement Techniques for Digital Hearing Aid

Dr. P Akhendra Kumar
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

Speech understanding in adverse noisy environments is a major problem even for a normal hearing person and this problem escalates for a hearing-impaired listener. Statistics reported by the Ministry of affairs, India says that there are 5.8 % of the total population suffering from hearing disability. The disability rate is higher in females in the category of hearing. This proposal contributes to the development, evaluation and implementation of speech enhancement (TSE) algorithms for hearing-impaired people. New techniques for TSE are introduced to reduce the noise content for binaural hearing aids. The algorithm development in the MATLAB environment is the first step in the process. Two different TSE algorithms will be developed in this proposal, which includes a novel sideband reduction technique using Frequency slice wavelet transform based speech enhancement technique and also a novel deep neural network-based Direction of Arrival (DOA) estimation for localization. The performance of these methods will then evaluate using both subjective and objective measures. The evaluation results show that there is a clear speech quality and intelligibility improvement of the proposed methods over the conventional TSE techniques and thus clear improvement in understanding telephonic speech by the hearing-impaired people. Finally, the utilization of these techniques in a product will include its digital signal processor (DSP) implementation as well on a smartphone as an application that performs real-time Speech Quality enhancement.

Keywords: *Hearing Aid(HA), Digital signal processor (DSP), Smartphone, Direction of Arrival(DOA)*

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Design and implementation of SRAM cell

M. Aditya
Department of Electronics and Communication Engineering, Vignana Bharathi Institute Of Technology, Hyderabad - 501301 India

Absract
Reversible logic shows a great potential in the design of Low-power circuits. Remarkable work has been done in design of basic arithmetic circuits. Present day progress in sequential circuit design of reversible logic circuits has shown new ways inperformance of Static random access memory (SRAM) and Dynamic random access memory (DRAM). As the memory size is increasing exponentially, the power absorbed by memory cells is also growing rapidly. In recent years reversible logic has achieved great interest because of its low power performances. This paper proposes a new SRAMcell which us e s Feynman gates. The proposed SRAM cell shows reduction of 66% in terms of quantum cost, 66% reduction in quantum delay, 60% reduction in number of gates count and 50% reduction in number of transistors count.

Keywords: Arithmetic circuits, static random access memory, reversible logic, feynman gate.

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Precision Farming Using Wireless Sensor Networks

Dr.Movva Pavani
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

The crop management system using Wireless Sensor Network (WSN) is a kind of autonomous solution to enhance agricultural technology. Precision agriculture could raise the crops yield, labour cost-saving and environmental protection against overuse of pesticide or fertilizers. Therefore, in the proposed, we use a wireless sensor system that will communicate with each other with lower power consumption. This is served with the help of WASPMOTE Board. The architecture than to be implemented in the sensor nodes will construct a wireless networking data collection at crop field likely to replace the conventional manually data collection system.

The sensor motes have several external sensors namely leaf wetness, soil moisture, soil pH, atmospheric pressure sensors attached to them. Based on the value of the soil moisture sensor the mote triggers the water sprinkler. Once the field is sprinkled with adequate water, the water sprinkler is switched off. Hereby water can be conserved. Also, the value of the soil pH sensor is sent to the base station and in turn, the base station intimates the farmer about the soil pH via SMS using GSM modem. Obtaining the soil pH value in his mobile the farmer selects the necessary fertilizer and crop for his next season. Hereby the amount of fertilizer used can be reduced.

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Modeling and analysis of Capacitive based MEMS Energy Harvester

G.V. Ganesh
Department of Electronics and Communication Engineering, Vignana Bharathi Institute Of Technology, Hyderabad - 501301 India

This research proposes a unique capacitive-based energy harvester that is both accurate and sensitive. The capacitance varied according to the amount of light energy that could fall on the proposed structure's top layer's surface. When the light intensity is changed, the cantilever's displacement changes, which changes the voltage between the plates, which changes the overall capacitance of the proposed system. For applied voltages of 0.25v to 3v, the minimum and maximum capacitance values are 15f to 600f. The structure is modeled using the COMSOL MultiPhysics FEM tool, and capacitive sensitivity is determined as a function of voltage.

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Driver Fatigue Detection System

Dr.Movva Pavani
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

Fatigue is a major cause of road accidents and has significant implications for road safety. Several deadly accidents can be prevented if the drowsy drivers are warned in time. A variety of drowsiness detection methods exist that monitor the drivers' drowsiness state while driving and alarm the drivers if they are not concentrating on driving. The relevant features can be extracted from facial expressions such as yawning, eye closure, and head movements for inferring the level of drowsiness. The biological condition of the drivers' body, as well as vehicle behaviour, is analyzed for driver drowsiness detection. This paper presents a comprehensive analysis of the existing methods of driver drowsiness detection and presents a detailed analysis of widely used classification techniques in this regard. First, in this paper, we classify the existing techniques into three categories: behavioural, vehicular, and physiological parameters-based techniques. Second, top supervised learning techniques used for drowsiness detection are reviewed. Third, the pros and cons and comparative study of the diverse method are discussed. In addition, the research frameworks are elaborated in diagrams for better understanding. In the end, overall research findings based on the extensive survey are concluded which will help young researchers for finding potential future work in the relevant field.

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GAN and LSTM Based Deep Learning Techniques for Speech Emotion Recognition

Bennilo Fernadez,
Department of Electronics and Communication Engineering Chaitanya Bharathi Institute Of Technology, Hyderabad - 500090 India

Abstract: The on-demand need for accurate and near real-time Speech Emotion Recognition (SER) in human–computer interactions necessitate a comparison of known methodologies and datasets in SER to arrive at plausible solutions and a better understanding of this open-ended subject. Deep learning approaches for SER using available datasets are reviewed in this work, followed by traditional machine learning techniques for speech emotion detection. Finally, a multi-aspect evaluation of practical neural network techniques to voice emotion recognition is presented. This research aims to provide an overview of the topic of continuous emotion detection.

Keywords: CNN, Deep learning; Emotional speech database, GA, LSTM.

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Spectrum Management and Pricing in Heterogeneous Wireless Networks

Dr S. Shakeel Hashmi
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

As the technology progressed from 1G to 4G and deployment and research on 5G and 6G there's a rapid growth of communication devices and applications which brings a huge demand for bandwidth. As the bandwidth is limited concerning applications, the Heterogeneous network is the solution for utilizing multiple wireless architectures to exchange information over a wireless medium. In this network, a user shifts to multiple networks. If the user shifts from one network to another for proper resource utilization the issues like spectrum management, pricing and fairness will be observed. To deal with these challenges a heterogeneous wireless architecture, schemes to manage the spectrum and price are being proposed.

Keywords: Heterogeneous Network, bandwidth, pricing, spectrum utilization.

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Comparative study on Various Algorithms used for Clustering Sensors at Device Level in a Densed IoT Network

K.V.Sowmya1and Dr. J.K.R Sastry2

Department of Electronics and Communication Engineering, Malla Reddy Engineering College, Hyderabad - 500014 India

Abstract. Today's modern world is being driven towards automation and as well gathering any type of information from every nook and corner of the world which is possible through one of the technology named Internet of Things (IoT). IoT is not just a single technology but it is a combination of various technologies like embedded systems, wireless sensor networks, cloud computing etc. Basic IoT network consists of various layers; one among them is the device layer which is the base layer responsible for gathering the data from physical world through the sensors. Various sensors can be deployed into an area depending upon the type of application it is used for. Various homogenous sensors can be made into clusters due to which it would be beneficiary in terms of bandwidth and power consumption, number of internet connections required, fault tolerance, longevity of devices etc. This paper presents a comparison between various algorithms used to cluster the sensors at device level.

Keywords. IoT, Sensors, Device layer, Clustering, Clustering algorithms

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Use of Artificial Intelligence in Wireless Communication

Dr S. Shakeel Hashmi
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

The next-generation wireless networks are developing into very complex systems because of the much-diversified service requirements, heterogeneity in applications, large number of devices, and networks. The use of Artificial intelligence technologies beyond 5G and 6G simplifies the network operators need to make the best use of the available resources, for example, power, spectrum, as well as infrastructures. AI in wireless communication calls for new network architecture and system models as well as standardized interfaces /protocols/data formats to facilitate the large-scale deployment of self-aware, self-adaptive, and predictive networking. This paper discusses the challenges and opportunities for AI-based resource management to widely deploying AI in future wireless communication networks.

Keywords: 5G, 6G, artificial intelligence (AI), resource management, next-generation wireless.

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Density based Anomaly Detection and Characterization in Composites Inspected by Quadratic Frequency Modulated Thermal Wave Imaging

V. S. Ghali1 and G. T. Vesala1

Department of Electronics and Communication Engineering, Vignana Bharathi Institute Of Technology, Hyderabad - 501301 India

E-Mail.ID: gvs0raos@gmail.com

ABSTRACT

Density-based machine learning algorithms have been used to solve various problems in a variety of applications. Active infrared thermography (AT) is non-destructive testing that is widely used to identify and characterize defects in various industrial components such as metal and composite structures. In addition to the signal and image processing techniques that enhance defect signature in the observed thermal history, the recent past witnessed machine learning based processing techniques that provide automatic defect detection. The present article uses density-driven K-nearest neighbor (KNN) to detect and characterize the artificially drilled back hole defects in a carbon fiber reinforced polymer specimen inspected by quadratic frequency modulated thermal wave imaging. Initially, the defect detection is carried out using local outlier factor supported by KNN as an unsupervised anomaly detection approach considering the highly class imbalanced nature of thermal data. Later, the depth of the classified defect was estimated using the KNN regression approach. Further, the thermographic and machine learning quality metrics are used to assess the reliability of the proposed methodology.

Keywords: Anomaly, Automatic defect detection, Carbon fiber reinforced polymer, Density, Defect characterization, Quadratic frequency modulated thermal wave imagi

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Smart Email Systems

Mr. D V Nair
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

Email systems are now becoming intelligent. Composing emails to friends, colleagues have become easy with the introduction of new features in the email system like composing sentences and suggesting alternatives on its own by the system. This is done by using a form of AI known as natural language processing, which aims to understand and use languages in human-like ways. The next big change that emails systems are likely to witness is generating email based on predictive modelling. Here emails will be customised for each contact, concerning the person's recent activities/achievements all by the system. The advantage over such an email system will be the high chance of it being read by the recipients. This will directly help widen the reach to prospective clients and add to business prospects. This will improve deliverability and optimize email outreach. The work here proposes to study and build smart email systems.

Keywords: Smart email system, natural language processing, predictive modelling, artificial intelligence.

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Microgrid as a Solution to the Power System with High Penetration of Renewables

Mr. D V Nair
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

There is a need to move towards clean energy resources, amidst rising amounts of carbon gas emission in the atmosphere by fossil fuel-based power generation. The UN climate change conference, COP 26 at Glasgow has renewed the pledge for greenhouse gas emission reduced to net zero by 2050. The move towards cleaner energy resources needs to move away from centrally controlled generation to distributed generation (DG) using renewable resources. But high penetration of renewables will have an adverse impact on the conventional grid structure and its operations. The microgrid concept is a solution proposed to control the impact of DG on grid operation and make conventional grid suitable for large scale penetration of renewables in form of DG. Microgrids are small entities in a power system network capable of coordinating and managing DG in a decentralized way reducing dependence on centralized coordination and management. The motivation behind using microgrid is to divide the enormous conventional grid into smaller and more operable grids. The controller capabilities of a microgrid are one of the most crucial elements in determining the introduction of this new concept to the utility and for its acceptance. The main objective of control systems in microgrids is to continuously supply power to the loads despite the changes in the system. A microgrid may be operating in grid-connected mode or islanded mode. One or more DG units may connect to/disconnect from the grid, or there might even be significant changes in the amount of power demanded by the loads. Under all these circumstances, the microgrid control shall ensure that power is supplied to the loads with acceptable voltage and frequency characteristics. In the proposed work to be carried out here the requirements of control systems in managing load and optimization of controller parameters would be studied and newer ways for efficiently handling load requirements with the concept of microgrid will be developed.

Keywords: Distributed generation, Microgrid control, Microgrid management system, renewables.

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Asymmetric Lightweight Cryptosystem implementation In FPGA using Reversible Logic Gates

Boppana Murali Krishna
Department of Electronics and Communication Engineering, Malla Reddy Engineering College, Hyderabad - 500014 India

Abstract
The incredible growth in wireless technologies and adapting nature of electronic devices, integrating together gains more popularity in utilization. Day-to-Day most of these devices communicate in an every minute. Protected channel establishment between cloud and remotely connecting IOT devices for communication is essential to avoid Cyber Crimes. Cryptography plays an important role in cyber theft. Lightweight cryptography gains more significance due to its energy requirements, memory, low cost and high security. Asymmetric lightweight cryptosystem (ALWCS) is meant which reduces the area, power and improves the safety . AHLWCS is designed on Artix-7 XC7A35T-1-CPG236 reconfigurable architecture using verilog hardware description language (HDL) which is synthesized, simulated and implemented on VIVADO.

Keywords: IOT, Cryptography, Memory, HDL, VIVADO

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An Investigative Study on the Possible Terahertz Sources for the Future Based on Semiconductor Device Technology

Dr. Soumit Samadder Chaudhury
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

Recent interest in wireless local area networks has enthused considerable research activity at frequencies above 60 GHz. Indeed the idea of exploring the potential bandwidth and propagation properties for carriers in the range 100 GHz to 1 THz has led to recently increased investment in terahertz technology research. Before the boom in communications and an increased emphasis on remote sensing, the major interest in terahertz technology lays almost exclusively with radio astronomy. There are now worldwide initiatives across the terahertz frequency range (broadly defined in the frequency range 60 GHz to 10 THz). This activity has prompted a shift in emphasis from the detection of terahertz signals (primarily the domain of radio astronomy) to the generation of signals for local oscillators. Simultaneously, this reflects the fact that the biggest challenge facing the development of terahertz technology is the requirement for a solid-state RF source with useful output power and efficiency typically greater than 100 pW and higher than 3% respectively, whilst maintaining an acceptable noise performance. This is an essential prerequisite for the development of compact low power transponders, in contrast to the established far-infrared lasers and travelling wave tubes used in existing terahertz systems. Another problem faced by the terahertz designer is the difficulty of achieving acceptable performance at room temperature or above when most available systems require cryogenic support. Despite these difficulties Semiconductor-Insulator-Semiconductor receivers have been built at frequencies up to 600 GHz and oscillators based on semiconductor devices operating in the frequency range of 100 to 300 GHz are now widely reported. This project work would address the prospects for terahertz technology in the context of satisfying the requirements for future communication systems and will consider circuits and devices suitable for operation in this frequency regime. It will examine the state-of-the-art in semiconductor device technology for terahertz applications and the prospect of monolithic integrated circuit technology for frequencies above 100 GHz.

Keywords: *Terahertz; semiconductor; transmitter; receiver.*

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An Implementation of K-Means Clustering for Efficient Image Segmentation of Natural Background Images

1Aswin Kumer S V, 2L S P Sairam Nadipalli, 3P Kanakaraja,

Department of Electronics and Communication Engineering, Malla Reddy Engineering College, Hyderabad - 500014 India

Abstract— The process of pixel correlation and the process of pixel group formation is based on the similarities of the pixel available in the input image data is well known as image segmentation. The K-Means is a technique which is used to form a cluster of the pixels in a particular image. The input image will be feature extracted by converting it into gray scale image. Based on the process, the processing of K-Means begins for pixel differentiation and grouping of the same based on the algorithm defined and developed. At first, it finds the center pixel and the grouping can be performed with respect to the center pixel. This same process will be repeated until the expected object discriminations is achieved. The pixel correlation plays major role to achieve the exact object discrimination. For the betterment of visualization, the image is processed for reshaping. The K-Means algorithm helps to achieve the good results in a simple way when it is compared with the other segmentation algorithms.

Keywords— Image Reshaping, Label Function, Cluster Centers, K-Means Clustering, Image Segmentation, Image Processing

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Complementary Split Ring Resonator loaded Circular Substrate Integrated Waveguide cavity-based Multiple Bandpass Filter.

Dr. Soumit Samadder Chaudhury
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

Compact size and high-performance microwave filters are mostly required in modern wireless communication systems. The design and development of microwave filters having multiple passbands with reduced size and improved selectivity within a single cavity remains a challenge. Multiple band filters whose features are adopted from the concept of microstrip line show relatively low-quality factors, whereas waveguide filters are bulky and are rejected from high-density integrations. Substrate integrated waveguide (SIW) has the advantage of high-quality factor (Q), low insertion loss, better structural compactness, low cost and easy integration, thus it combines the finest and balancing features of both planar transmission lines and nonplanar waveguides. This project aims in presenting a novel structure of compact multiple bandpass filter based on circular cavity substrate integrated waveguide. Complementary split-ring resonators (CSRR) will be loaded into the cavity to reduce the frequency of resonance by lowering down the centre frequency of the passband below the waveguide cut-off frequency. Here, the entire stopband of the waveguide will be utilized to generate single or multiple passbands by defining particular dimensions to the CSRRs loaded into the cavity. A circular SIW cavity structure will be designed with a cut-off frequency of 12 GHz so that the stopband extending nearly up to 11 GHz could be used to generate passbands within it. Introducing asymmetric geometry in the pairs of CSRRs will lead to a generation of multiple passbands below the cut-off frequency. The resonating frequencies of the passband can be independently controlled just by varying the dimensions of the loaded CSRRs. The designed filter structure will be initially modelled and simulated in Ansoft HFSS and later the proposed structure will be fabricated and the frequency response would be measured to validate the multiple bandpass filter.

Keywords: *Substrate integrated waveguide (SIW); complementary split-ring resonators (CSRR); multiple band filters.*

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Design and Implementation of Concurrent Dual-Band Band Pass Filter for Nanoscale Applications

Surendra Kumar Bitra1 and Sridhar M

Assistant Professor, ECE Dept CMR College Of Engineering & Technology, Hyderabad - 501 401 AP India

sridhar.m@ cmr.ac.in

Abstract:

In this paper, investigation on Hybrid Metal Insulator Metal (HMIM) plasmonic waveguide (PWG) filters for dual-band applications. The filters are designed using circular ring resonator (CRR) and CRR with single as well as dual slits. The filters are connected using coupled line feed. The dual-band Band Pass Filter (BPF) characteristics can be realized by varying radius (r) and gap (g) between the feed and ring resonator. The proposed CRRs are operated at THz frequencies. The filters are designed and simulated using commercially available CST studio suite software under Perfect Matched Layer (PML) boundary conditions by keeping 5 nm x 5 nm mesh size. The transmission and reflection characteristics of the filters are explained by the resonance conditions, which agrees with theoretical calculations. The proposed work is best suitable for the plasmonic integrated optical circuits for nanoscale applications.

Keywords: HMIM Waveguide, CRR, Single Slit and Dual Slit.

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Development of Perturbation Techniques to Independently Control the Excited Modes and Thereafter the Passband Center Frequencies of Multiple Bandpass Filter Based on Substrate Integrated Waveguide

Dr. Soumit Samadder Chaudhury.
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad,501203

Abstract:

Modern microwave communication systems readily welcome high-performance multiple bandpass filters with autonomous control over passbands. Various research groups worked out to propose compact multi-band filters with high selectivity, improved out-of-band response and independent passband tuning ability. Substrate integrated waveguide (SIW) possess the properties of high-quality factor, low insertion loss, structural compactness and planar integration ease to provide a base for high performance miniaturized filters. SIW loaded with complementary split-ring resonators (CSRRs) are used to propose compact bandpass filters but compromises with out-of-band rejection level. Whereas a mushroom structure with a metallic patch and via, being a composite right/left-handed resonating structure is advantageous for designing compact bandpass filters with high-quality factor, improved selectivity and out-of-band response. This project proposal describes a method of independent control over the excited modes of mushroom resonator loaded to SIW. This development will introduce the feature of an autonomous tuning of passbands into such mushroom loaded filters which are already enriched in quality factor, selectivity and out-of-band response. A mushroom resonator composed of two parallel plates shorted by a metallic through a dielectric substrate would be loaded into the cavity of a SIW after etching out a portion of the upper conductor of the SIW. Circular and linear perturbation slots could tactically be introduced into the mushroom resonators to separately perturb the excited modes of these resonators inside the SIW cavity. This perturbation procedure using such slots will be employed to independently control the resonance frequencies of the modes and hence the center frequencies of multiple passbands.

Keywords: *Substrate integrated waveguide (SIW); mushroom resonator; resonating modes; perturbation slots.*

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Particle Swarm Optimization Based Maintenance Scheduling of Phasor Measurement Units

Dr. Soumitha Ghosh
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

To ensure reliable power to the consumers it is the foremost challenge to have an overview of the geographically wide-spread and extensively interconnected infrastructure of power generation, transmission and distribution. The phasor measurement units are such devices that capture the unique information (current phasor and voltage phasor) at each point where they are connected. Thus fulfilling the requirement of providing situational awareness of power systems to the system operators. These devices however like all other instruments in the power system are required to undergo maintenance (planned or forced). We aim to provide maintenance scheduling of PMUs connected in a power system network through Particle Swarm Optimization (PSO). The PSO will be utilized to find the best solution keeping the situational awareness of the system intact.

Keywords: Phasor measurement units, maintenance scheduling, particle swarm optimization.

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Improvement in Performance of Advanced Nano scale MOSFET Using High-k Dielectric

Biswajit jena
Department of Electronics and Communication Engineering, Malla Reddy Engineering College, Hyderabad - 500014 India

ABSTRACT

Recent advancement in semiconductor industries are taking portable device manufacturing to a different level. According to the need of the consumers, these portable devices are further scaled down so that they can be more user-friendly and convenient to use. As MOSFET is the building chunk for all these semiconductor devices, its miniaturization is the most vital task to be performed. Transistor count no longer increases according to Moore's law rather it is following more than Moore's concept. In order to scale down the devices into the next technology node, device dimension scaling is not the ultimate solution. Different material engineering techniques should be followed to take the miniaturization to a different level. Dramatic changes in the semiconductor industry in the past few decades to improve device performance have been accompanied by the shrinking of the size of logic and memory devices. This scaling requires drastic reduction in the size of dielectric to achieve higher capacitive densities. Introducing high-k dielectric in place of normal dielectric provides the opportunity to scale down the device to next level. The dielectric with low-k cannot scale down below 1 nm (fundamental limit), as it will not behave as dielectric anymore, so high-k is the ultimate solution for these types of device dimensions. However, the need to lay the high-k material over silicon body creates some fabrication issues, which can be resolved by introducing a thin interfacial layer in between.

Keywords: Nano, High-K, Moore's, Interfacial Layer, MOSFET

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Development of Low-Cost Diabetic Eye Care Aid for Healthy India

Dr. P Akhendra Kumar
Department of Electronics and Communication Engineering,
IcfaiTech (Faculty of Science and Technology), ICFAI Foundation for Higher Education,
Hyderabad, 501203

Abstract:

In India at present, there are around 45 million diabetics and every individual is a probable one for blindness due to Diabetic Retinopathy (DR). Early detection of Diabetic Retinopathy (DR) is essential to start treatment for diabetes for avoiding blindness. It is possible to detect the early symptoms of polydipsia and polyuria. So that to create awareness about diabetic retinopathy in the community. The proposed deep neural network will be able to recognize diabetic retinopathy and its stage for the Indian community accurately. The proposed diabetic eye care aid is also providing the percentage of vision impairment. The final implementation will carry a low-cost Raspberry Pi model along with the Intel Neural Compute Stick, which is very much useful for developing countries likes India and especially for the rural community. Although the proposed work is targeted for diabetic eye care aid, it can also be very much helpful for eyesight detection. This project proposes to develop an Automatic Screening System for Diabetic Retinopathy indigenously to prevent so many people from becoming blind due to diabetes in India.

Keywords: *Diabetic Retinopathy (DR), Raspberry Pi, eye care aid.*

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Impact of micro-cantilever shape on the performance of bio-sensor for swine flu detection

1 S. Sunithamani,

Department of Electronics and Communication Engineering, Vignana Bharathi Institute Of Technology, Hyderabad - 501301 India

Abstract:

Micro electro mechanical Systems (MEMS) is the innovation of the small device, they are partitioned and unmistakable from the speculative vision of sub-atomic nanotechnology and hardware. MEMS are microscopic device normally fabricated on silicon wafers. MEMS are comprised of segments near 1 and 100 micrometers in estimate (i.e., 0.001 to 0.1 mm), and MEMS gadgets for the most part run in measure from 20 micrometers to a millimeter. They as a rule comprise of a focal unit that procedures information (the microchip) and a few segments that cooperate with the surroundings, for example, micro sensors. The stretch is transduced towards the site at which particles of the functionalized layer are associated with the cantilever surface. Micro sensors converts the deliberate mechanical energy in to an electrical energy. Generally, the materials such as Silicon, Polymers, are used in MEMS manufacturing process. These materials are used to get the required shape of devices and sensors used for fabrication. This paper presents the Effect of micro-cantilever shape on the performance of bio-sensor for swine flu detection application.

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Design and Implementation of High Performance and Low-Power 6T-SRAM Cell Using Cadence EDA Tool

Fazal Noorbasha[1], Harikishore Kakarla

Department of Electronics and Communication Engineering, Vignana Bharathi Institute Of Technology, Hyderabad - 501301 India

Abstract- Now a days each and every device equipped with large capacity memories in order to full fill all the needs of customers. And there are some other parameters which plays an important role in the determination of performance of the device. In many widgets, memory is an integral part and its size also scales down as the device size is reduced. For this reason, every computerized device has low power and high speed is a prime concern. Current day scenario suggests that 6T SRAM is commonly used for the SRAM based memory designs as they are advantageous compared to other cells. They are power consumption and delay. Low power is the major concern of today's electronics industries where, Static as well as Dynamic power dissipation are the two key parameters that should be taken into consideration. To meet consumer needs high bandwidth and low power and high speed consuming storages are also required. This paper mainly focuses on reducing delay of Static Random Access Memory (SRAM). Power reduction and Delay reductions are the major challenge of digital Industry. The techniques we have for delay reduction are aspect ratio or cell ratio and Supply Voltage (VDD). A simple and advantageous configuration of a SRAM cell is by connecting two CMOS inverters back to back. This configuration has good noise immunity.

Keywords: SRAM, CMOS, MTCMOS, Gatted VDD.

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Measurement of Stiffness of HT-29 Cells Using MEMS Sensor

Syed.Shameem, P.S.Srinivas Babu

Assistant Professor, ECE Dept CMR College Of Engineering & Technology, Hyderabad - 501 401
AP India

Now a day's measurement of physical parameters of cancer cells to estimate the severity of the disease is of predominant research for the design of the sensors. We have designed a model to measure the stiffness of cancer cell. In this work colon cancer cell has been considered for measuring the stiffness. The simulation results shows that the stiffness of the cancer cell is less when compared to normal cells. This work has been simulated in COMSOL 5.2. The pressure Vs the deformation of the cell is graphs has been drawn. As the pressure increases the deformation of the cell is observed to be more. The deformation model is mathematically solved.

Keywords: MEMS, Sensor, stiffness, COMSOL