ENIGMA

e-NEWSLETTER

vol. 1

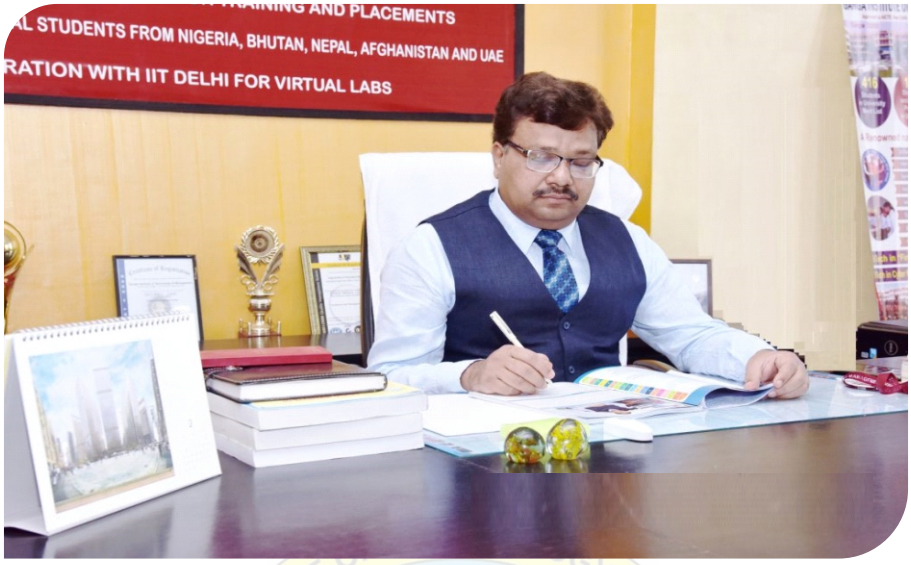
Edition-1

OCT-2018

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

DIRECTOR'S DESK



I am elated at the publication of ENIGMA (ECE newsletter), vol.1 for the academic year 2018-19. I sincerely hope that the newsletter proves to be an enjoyable and useful apparatus in the hands of both students and teachers of the college. I extremely happy & delighted that the students have come up with comprehensive contents which highlights the abilities & potentials of the students

Prof. Dr. Aman Aggarwal

HOD MESSAGE

I am very happy that the Department of Electronics and Communication Engineering is releasing its Newsletter vol.1 for academic year 2018-19 enumerate the various activities and achievement of our faculty and students.

The department endeavors to produce high quality, technically competent and socially responsible engineer. The department offers excellent academic environment with a team of highly qualified faculty members to inspire the students to develop their technical skills and inculcating professional ethics.

Dr. Rakesh Kumar Joon

VISION MISSION OF INSTITUTE

VISION

GITAM aims to be an outstanding Institute in India through academic excellence in the field of Technology and Management to fulfill the need of the Industry and serve the society.

MISSION

- **To provide healthy environment to our students as well as faculty members.**
- **To achieve excellence in technical education**
- **To promote holistic development of students through interaction with alumni, academia, Industry and expert lectures**
- **To attract nurture and retain the best faculty and technical manpower**
- **To contribute to the society by inculcating professional ethics in the students**
- **To promote research and development Initiatives**

ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT

VISION

The Department of Electronics and Communication Engineering endeavors to develop high quality, technically competent and socially responsible engineers.

MISSION

- **To have adequate mechanisms by enhance understanding and implementation of theoretical concepts in practical scenario.**
- **To develop technical manpower by organizing workshops, expert lectures and industrial visits on regular basis.**
- **To impart quality teaching-learning experience with state of the art laboratories.**
- **To prepare the students to meet the global needs of Industry and Society by inculcating professional ethics**

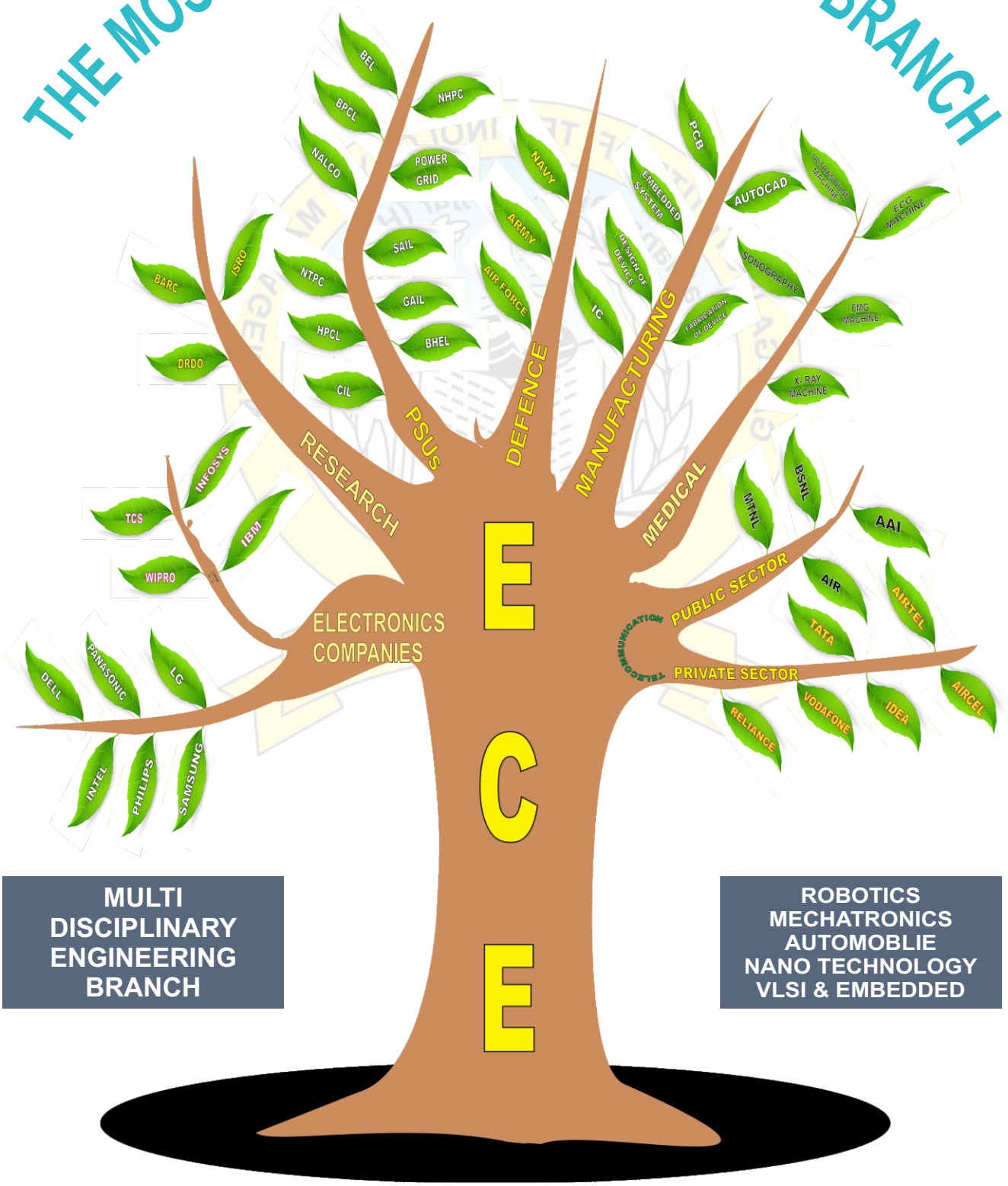
ABOUT ECE

The Department of Electronics and Communication Engineering is established to run a four years full time B.Tech programme as well as two years M.Tech Programme with focus on latest developments in engineering & technology. The Department has highly qualifid and well experienced faculty. Each faculty member is at least a postgraduate in engineering in his/her field and some of them are PhD (Doctorate) in Electronics and Communication Engineering branch

PROGRAMME	DURATION	INTAKE
B.TECH ELECTRONICS & COMMUNICATION ENGINEERING	4 YEARS	60
B.TECH ELECTRONICS & COMMUNICATION ENGINEERING (LEET)	3 YEARS	6
M.TECH ELECTRONICS & COMMUNICATION ENGINEERING	2 YEARS	24
DIPLOMA ELECTRONICS & COMMUNICATION ENGINEERING	3 YEARS	60
DIPLOMA ELECTRONICS & COMMUNICATION ENGINEERING (LEET)	2 YEARS	6

WHY ECE ?

THE MOST FLEXIBLE ENGINEERING BRANCH



MULTI DISCIPLINARY ENGINEERING BRANCH

ROBOTICS
MECHATRONICS
AUTOMOBLIE
NANO TECHNOLOGY
VLSI & EMBEDDED

EXPERT LECTURE

TOPIC : Current Innovations & How to approach for Masters / Ph.D from Institution of International repute

SPEAKER : Dr. Deepak Jain (Postdoctoral fellow at DTU Fotonik, Department of Photonics Engineering at Technical University of Denmark)

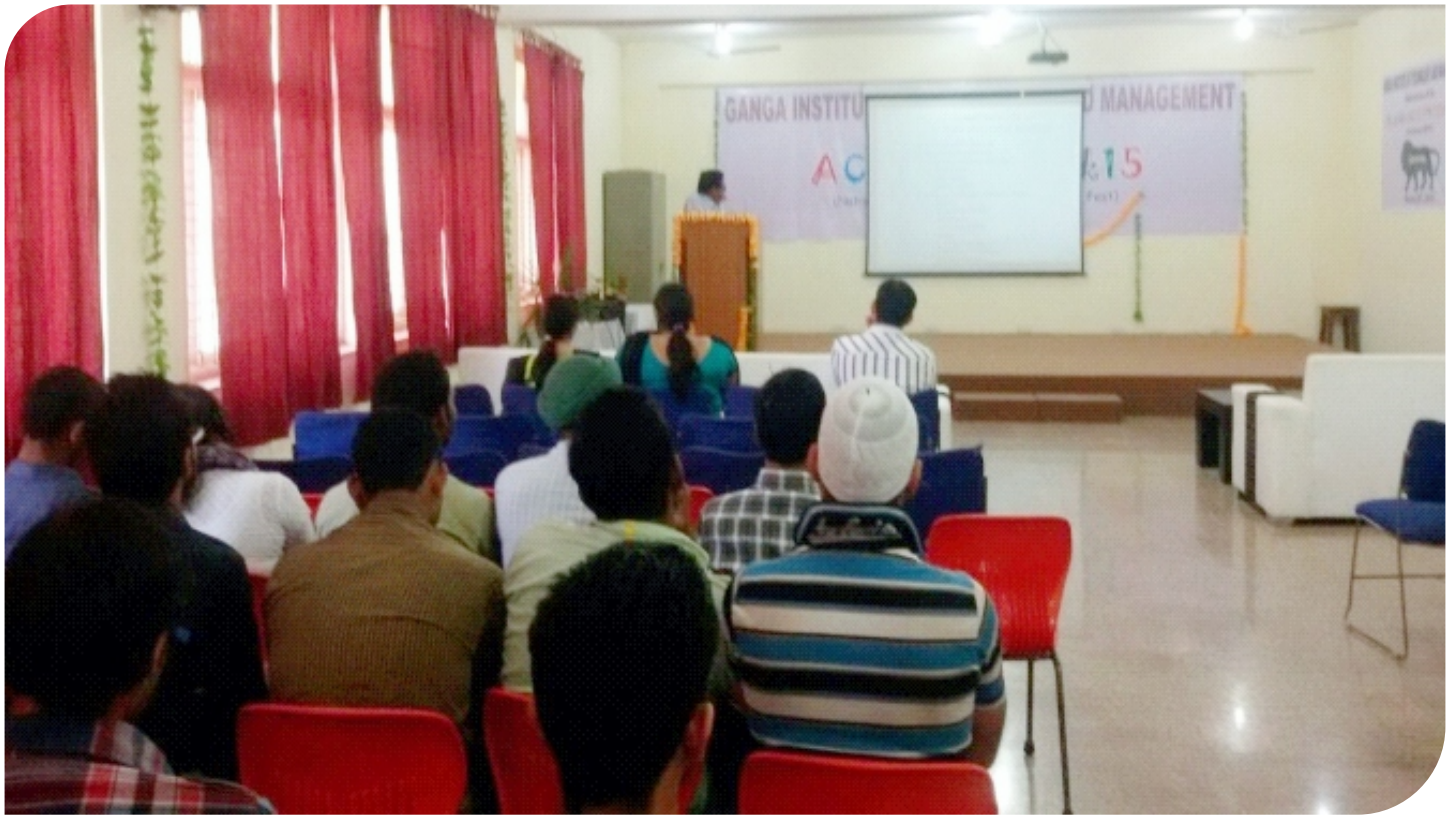
An expert lecture was a delight for the students, organized by Electronics and Communication Department, GITAM, on 22 March 2017. The expert Dr. Deepak Jain is having experience of more than 11 years in the field of Optical Communication. The session was started with the warm welcome by Head of the department.

The expert discussed the content as below:

- **Innovations in optics**
- **Transmissions in fiber optics**
- **Fading and attenuation in optics**

Expert lecture was followed by interesting questions and answering session. It was attended by 89 students of ECE department and all the faculty members.

At the end vote of thanks was proposed by head of the department on the behalf of department as well as GITAM.



EXPERT LECTURE

TOPIC : Raspberry Pi & Arduino
SPEAKER : Dr. Priyanshu and Mr. Sachin Kataria

An expert lecture was a delight for the students, organized by Electronics and Communication Department, GITAM, on 12th April. 2018. The expert Mr. Priyanshu and Mr. Sachin Kataria are having experience of more than 07 years in the field of Arduino Programming. The session was started with the warm welcome by Head of the department.

The expert discussed the content as below:

- **Introduction to Raspberry pi**
- **Programming of Raspberry pi**
- **Hardware projects based on Raspberry pi**
- **Emertxe Raspberry pi development board**

Expert lecture was followed by interesting questions and answering session. It was attended by 92 students of ECE department and all the faculty members.

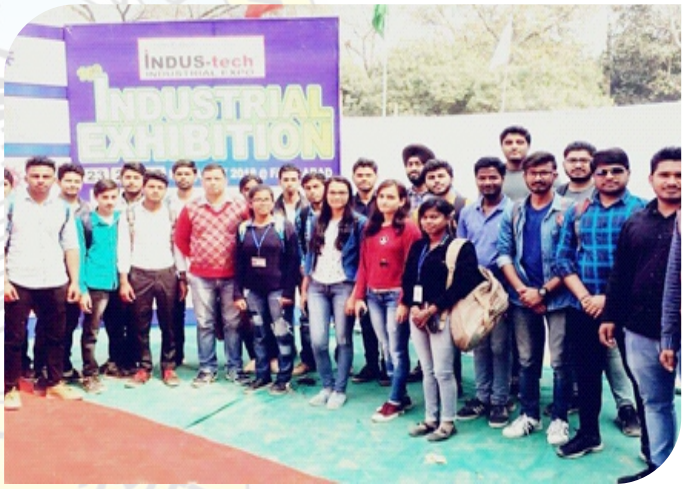
Indus-Tech Industrial Expo Faridabad on 23.02.2018

PARTICIPANTS : 84 Students of ECE Department

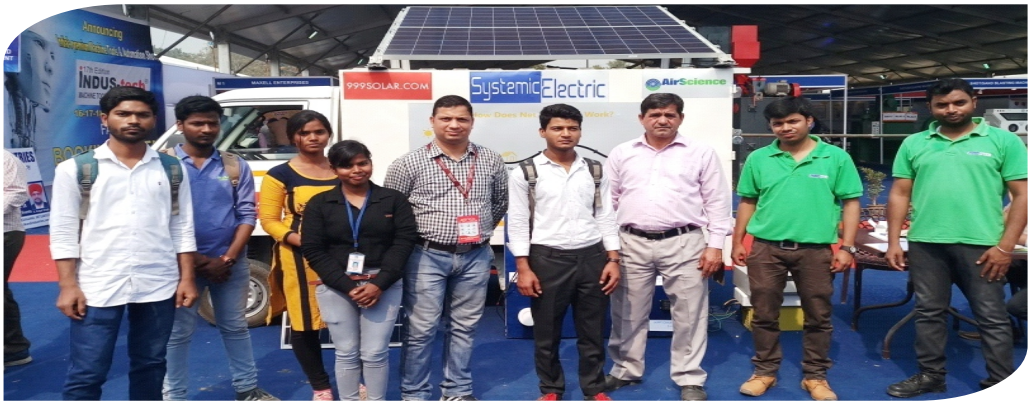
Students of ECE Deptt. along with faculty members, named Mr. Satish, Mr. Ravi Garg and Mr. Rajpal visited. The bus started around 7:30 AM. from college campus itself, some students gathered there and some students were near their pick up points to board the bus and the bus move towards Faridabad. Sharply at 11:25 A.M. we reached the Industrial Exhibition, Faridabad. After some formalities at entry, students and faculty members entered. Around 11:45 am Hon'ble cabinet minister of Haryana Mr. Piyush goyal arrived and inaugurate the Industrial exhibition and tell us many important aspects and benefits of this exhibition. He also tells us the benefit of this kind of event.

Students have seen the following process and technology:

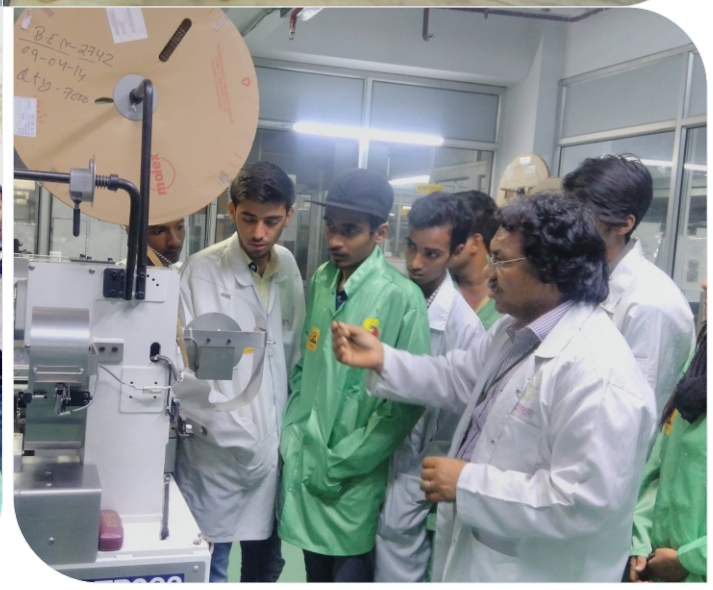
- **Fabrication process of IC designing.**
- **PCB designing.**
- **Designing of basic elements.**
- **Functioning of Laser Technology**
- **Working of 3D Technology based Fan.**



Students were asking the questions and experts from different domain answers their queries.. They also show us a 3-D technology based fan which was the new concept. After the completion of visit that was more than six hours. Students fill their feedback Performa. At 3:20 P.M. we moved back to our destinations. It was an indeed a very good experience for everyone.



Industrial Visit to Sahasra Sambhav

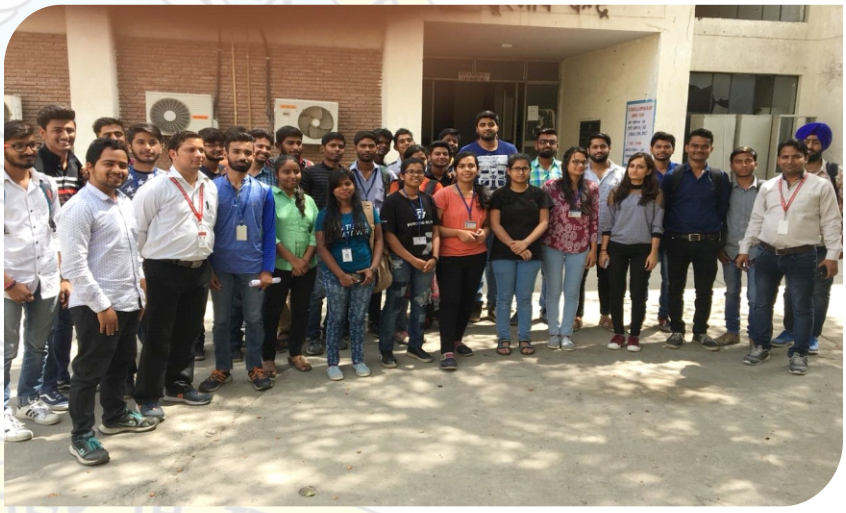


Industrial Visit to BSNL, BAHDURGARH

Students of ECE Deptt. along with faculty members, named Mr. Satish and Mr. Deepak Gupta visited.

The bus started around 10:30 AM. from college campus itself, some students gathered there and some students were near their pick up points to board the bus and the bus move towards Faridabad. Sharply at 11:10 A.M. we reached the BSNL, Bahadurgarh. After some formalities at entry, students and faculty members entered.

Around 11:30 am Dinesh Kumar , Junior Telecom Officer, BSNL Bahadurgarh visited the students in the switching room, Fibre- Optic communication Technology, BSC and Main exchange room. He also tell us complete communication process and the technology adopted by BSNL. He also tells us the basic of BTS Planning.



Basics of Next Generation Networks and Broadband technologies. The students were very happy by this visit. This is a very beneficial visit for the students.

Students were asking the questions and experts from different domain answers their queries. They also show us a 4-G Technology based communication process. After the completion of visit that was more than three hours. It was an indeed a very good experience for everyone

Research @GITAM

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Maximum Coverage Range based Sensor Node Selection Approach to Optimize in WSN

Rinku Sharma[1], Dr. Rakesh Joon[2]
[1]Post Graduate Scholar, [2]Assistant Professor, Department of Electronics and Communication Engineering, Ganga Institute of Technology and Management, Kablana, Jhajjar, India

***Abstract:** In Wireless sensor network energy optimization is major issues to be concentrated. This paper concentrates on energy saving with maximum sensing range and transmission range of sensor node and finding the minimum hop path between the nodes. An algorithm called Minimum Hop Maximum Range routing (MHMR) has been designed to optimize energy by using maximum coverage range of sensor nodes in WSNs. By using this algorithm an energy effective minimum hop path is selected over the network between the source node and destination node (sink node) to improve the network lifetime and reduce the delay. Simulation results show that proposed algorithm can significantly improve network life time and provide energy efficiency.*
***Keywords:** Wireless sensor network, MATLAB, Range, Sensor node.*

I. INTRODUCTION

Wireless sensor networks consist of a large number of sensors nodes which are also called motes. These nodes are required to operate in a hostile environment for a maximum duration without human intervention. A sensor node is a small device that includes four main components: a sensing unit for data acquisition, communication unit to allow the transmission/reception of information to/from other connected devices, a microcontroller for local data processing and for memory operations and a power source which is usually a small battery. Wireless sensor networks support a wide range of applications such as target tracking, environmental monitoring, health monitoring in hostile environment [1]. Smart home environment is the important application of Wireless sensor network. Smart home environments can provide custom behaviors for a given individual [2]. Wireless sensor networks exhibits some problems like energy capacity, sensor locations, battery power, sensing range, scalability etc. [3].

To improve the energy efficiency of transmission data, many of energy efficient routing protocol are designed to define the minimum energy consumption path and shortest path between sending node and receiving node. Due to network partitions and some network failures cause data packet loss and the multiple transmissions of data packets in selected path that makes much more consumption of the energy. If energy consumption is increased then network life time is decreased. Therefore, both energy consumption and network lifetime must be balanced [4].

Research @GITAM

Forecasting the Price of Cryptocurrencies and Validating Using Arima

Ruchi Mittal[a], Rashmi Gehi[b], M.P.S Bhatia[a]

[a]*Division of Computer Engineering, Netaji Subhas Institute of Technology, New Delhi, India*
[b]*Division of Electronics and Communication Engineering, Netaji Subhas Institute of Technology, New Delhi, India*

Abstract: With the increase in popularity of cryptocurrencies, it is becoming extremely crucial to predict what the prices of the currencies are going to be in the future. This paper uses a dataset that consists of over 1500 cryptocurrencies with their prices starting from their initiation till May, 2018. A lot of the effort went into getting the data set ready before predicting the future prices of all the cryptocurrencies, i.e., making sure that the cryptocurrencies were stationary time-series. Beginning with learning about the ARIMA model and the conditions to run the model successfully, first validation of the model is done. An average accuracy of 86.424 is observed for 95% of the currencies are observed. After this validation, forecasting is performed on these cryptocurrencies and the percentage change of the price is calculated.

1. Introduction

Cryptocurrency, also popularly known as digital currency, is a medium of exchange that uses cryptography to secure financial transactions. It is a decentralized form of currency as compared to any central banking system. Cryptocurrencies use the blockchain technology that works on a very simple logic, which is that of having multiple copies of the same information. Or in a sense, a 'ledger' that is public information and can be accessed by anyone. Several individuals keep a personal copy of the ledger, which stops from any manipulation of data as whenever a change in information is noticed, the fraud is caught immediately. While 'miners' are using technology to verify the transactions by decoding complex puzzles, data scientists are using technology to predict the future prices of the cryptocurrencies to know how the market will change. Most use various machine-learning algorithms to figure this out. Machine Learning, a subset of artificial intelligence, uses statistical techniques that allow the computer to 'learn' from the data provided to them without explicitly programming them. Learning simply refers to the machine improving how to perform a certain task based on past experience. It has recently become an extremely popular practice of letting computers figure out patterns from data and learn from it as well as humans can. Another aim of machine learning apart from learning is abstract learning and presenting the knowledge the machine learns. Machine learning is popular in classification and prediction. Classification is the property of the machine where the machine can recognize and categorize things based on the data that is fed into it. Prediction is predicting future data by learning from past data. Thus, to simply to put it into words it is the extraction of knowledge from data. Multiple algorithms such as random forest regression have been used in the past to do forecasting. However in this paper we have used the ARIMA model to forecast values. The ARIMA model is a statistical analysis model that aims as understanding the data set better and producing results such as future prospects of the data from an input data that is strictly in time series. In short, ARIMA model works on three components of auto-regression, integration and moving average to predict future possibilities of a financial market by examining the differences in the values in series instead of the actual values.

ARIMA is a model that uses different model parameters according to the characteristics of the data. ARIMA requires the data to be stationary which will further be discussed in this paper and generated a future prediction of the value that is required. The model depending on its previous predictions can make multiple predictions. This model is majorly dependent on the previous data and the patters that the data has observed.

2. Illustrations

Bitcoin had dominated the decentralized banking market space from the beginning of its initialization in 2009. However, the exponential popularity of Bitcoin has also paved the way for thousands of other cryptocurrencies to come up and create a name for them. Extensive energy and hard work have been put into researching about Bitcoin and other highly popular cryptocurrencies like Ethereum, Litecoin, Ripple, etc. Grinberg R. in [1] talks of how Bitcoin is a great alternative digital currency. Nakamoto S. in [2] explains the peer-to-peer network. Herrera-Joancomartí in [3] extensively concentrates on the blockchain technology of Bitcoin and how the mining process works. It also puts in a lot of importance on the Bitcoin network and the anonymity of Bitcoin. Reid F. et al. in [4] also speak about the anonymity of Bitcoin. There are other papers too that have a broader view of Bitcoin such as Garcia D. et al. in [5] quantify different socio-economic factors of Bitcoin and Yermack D. in [6] talks on using Bitcoin as an actual currency.

The ARIMA model has been widely used in the past for forecasting, for example, McNally S. in [7] focuses on predicting the price of Bitcoin exclusively, using the ARIMA model and long short-term memory model of deep learning and compared the results found by both the models. Leopoldo Catania et al. in [8] focuses on using uni-variate and multi-variate models and combinations of both for forecasting the price of the above mentioned four most capitalized cryptocurrencies. Zhang G.P. in [9] focuses on time-series forecasting by creating a hybrid model of ARIMA and neural networks. Bakar, N. A. et al. in [10] has concentrated on using the ARIMA model to forecast the price of Bitcoin in a high volatility environment.

However, very little has been done to evaluate the performance of the thousands of cryptocurrencies that have come up over the years. Most of the concentration has been on Bitcoin, Litecoin, Ethereum, and Ripple.

Research @GITAM

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www.iosrjournals.org

Reconfigurable Fork ShapeMicrostrip Patch Antenna for Wireless Application

Snehlata Verma[1], Dr.Rishu Bhatia[2]
Post Graduate Scholar[1], Associate Professor[2]
Department of Electronics and Communication Engineering
Ganga Institute of Technology and Management
Corresponding Author: Snehlata Verma

Abstract: *The designed antenna is about a configurable fork shape microstrip patch antenna. The antenna design is based on reconfigurable frequency conditions. The antenna was tested and simulated, and the antenna gain was improved under different frequency conditions of 4 to 7 GHz. Slotted antennas are suitable for both single band and multiband frequencies. The antenna has a substrate based on the FR4 epoxy design. The parameters of power, gain and radiated directivity are modified. The work and tests are performed by the CST software. Antenna inspections and evaluation results are presented.*

Key Words: *Reconfigurable, Patch antenna, edge fed, Fork Shape, CST*

Date of Submission: 23-06-2018 Date of acceptance: 05-07-2018

I. Introduction

In recent years, antennas have played a very important role in the field of wireless communications. With the growth and increase of broadband technology, micro strip patch antennas are the most favored [1] [3]. It is widely used in satellite communications, aircraft, missiles, GPS systems, and broadcasting. Some of the antenna power amplifiers are low cost, low profile, small size and polarization [4] [6]. Basically, the expansion of dual-band antennas in wired antennas has been accomplished. The internal configuration of the handset antenna is obtained by organizing the size of the small antenna [6]. With the expansion of cellular communications, dual frequency input has a beneficial effect on the scene: relatively exquisite electrical aspects, compressed geometry, cheapness and sufficient functionality can create a single coaxial power supply [7] [8].

Similarly, reconfigurable antennas are important for wireless communications that are widely used in defense and marketing. Use a diode to reconfigure the antenna. [9] It is possible to modify the operating frequency, the radiation pattern and the real-time polarization [10] and, when the antenna is reconfigurable, the polarization includes straight linear and linear left polarizations [10]. The extreme hindrances of patch antenna bandwidth is restricted, gain is not high, little efficiency, lesser power and inadequate polarization. Therefore, in order to conquer theindicated numerous obstacles few resolutions have been recommended for instance slots, coaxial probe feeding techniques and diodes. [1-2]

In addition, another specific method is to consider the mode frequency and the model efficiency of the resonance characteristics of the hidden surface current wave. Due to the relevance of the applicability of the slotted patch antenna, the result of the fact that the category of the unintentional character sketch of the antenna has a larger capacity. We can also adjust the shape of the contrast in the form of slots of different width. Including the consideration of the diode positioning slot may favor the gain of the patch antenna, low dielectric constant and bandwidth. By controlling the slot, the patch antenna is affected. The diodes and capacitors of the patch antenna are represented correctly. [4] In the future, these conditions can meet the needs of the development of wireless technology.

Research @GITAM

INTERNATIONAL JOURNAL OF ELECTRONICS LETTERS
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Design of CMOS-based low-power high-frequency differential ring VCO

Nitin Kumar and Manoj Kumar

University School of Information, Communication & Technology, Guru Gobind Singh Indraprastha University, Delhi, India

ABSTRACT

An improved design of four-stage CMOS differential ring voltage-controlled oscillator (VCO) with high-output frequency, low phase noise, and low power consumption is proposed in this paper. A new differential delay cell has been used for differential ring VCO which utilises dual-delay-path topology to attain both high-output frequency and low phase noise. The simulation results have been obtained in TSMC 0.18-µm CMOS process with a supply voltage (V_{dd}) 1.8 V. The proposed design of VCO exhibits an output oscillation frequency range from 1.619 to 3.712 GHz. The power consumption for this frequency range varies from 4.628 to 10.545 mW with control voltage variation from 0.1 to 1.0 V. The proposed design occupies compact layout area of 0.207 mm^2 and achieves −89 dBc/Hz phase noise at 1 MHz offset from 3.712-GHz carrier frequency. Improved performance for this design has been achieved in terms of output oscillation frequency, phase noise, and power consumption.

ARTICLE HISTORY
Received 7 July 2017
Accepted 25 March 2018

KEYWORDS
Differential delay cell; dual-delay-path topology; low phase noise; low power; phase-locked loop; VCO

INTERNATIONAL JOURNAL FOR ADVANCE RESEARCH IN ENGINEERING AND TECHNOLOGY

WINGS TO YOUR THOUGHTS.....

Optimized Quantization Video Compression for H. 264/AVC

Abhishek Kumar Singh*, Dr. Rakesh Joon**

*M.Tech Scholar, ** Head of Department
Department of Electronics & Communication
GITAM , Kablana , Jhajjar

Abstract: *Rate distortion optimization (RDO) is used for improving video quality in H.264 video compression. Rate distortion optimization solves different problem by acting as a video quality metric, measuring both the deviation from the source material and the bit cost for each possible decision outcome. In this paper, we present a novel analytical method that directly solves the rate-distortion optimization problem in a closed form by employing a rate model for entropy coding. It has the appealing property of low complexity and is easy to implement. The results show that the proposed method gives global peak signal to noise ratio is 52.665 db.*

Keywords: *Local Peak signal to noise ratio, global, Rate distortion approach, video decoding.*

Research @GITAM

An Efficient Rate Distortion Approach for Video Compression

Abhishek Kumar Singh*, Dr. RakeshJoon**
*M.Tech Scholar, Department of Electronics & Communication, GITAM ,Kablana , Jhajjar
** Head of Department, Department of Electronics & Communication, GITAM ,Kablana , Jhajjar

Abstract: ***The digital video compression technology has been gaining popularity for many years. Today, when people enjoy HDTV (high definition television), movie broadcasting through Internet or the digital music such as MP3, the convenience that the digital video industry brings to us cannot be forgotten. All of these should attribute to the advances in compression technology, enhancement on mass storage media or streaming video/audio services. Most rate-distortion optimized quantization methods of video coding involve an exhaustive search process to determine the optimal quantized transform coefficients of a coding block and are computationally more expensive than the conventional quantization. In this paper, we present a novel analytical method that directly solves the rate-distortion optimization problem in a closed form by employing a rate model for entropy coding. It has the appealing property of low complexity and is easy to implement.***

Keywords: Rate distortion approach, SSIM, PSNR.
Local Peak signal to noise ratio, global, Rate distortion approach, video decoding.

I. INTRODUCTION

The digital video compression technology has been gaining popularity for many years. Today, when people enjoy HDTV (high definition television), movie broadcasting through Internet or the digital music such as MP3, the convenience that the digital video industry brings to us cannot be forgotten. All of these should attribute to the advances in compression technology, enhancement on mass storage media or streaming video/audio services.

The core of the MPEG-4 standard was developed early twenty first century, however MPEG-4 is a existing standard with new parts added continuously as and when technology exists to address devolving applications. The significant advances in core video standard were achieved on the capability of coding video objects, while at the same time, improving coding efficiency at the expense of a modest increase in complexity.

The digital video compression technology has been gaining popularity for many years. Today, when people enjoy HDTV (high definition television) [3], movie broadcasting through Internet or the digital music such as MP3, the convenience that the digital video industry brings to us cannot be forgotten. All of these should attribute to the advances in compression technology, enhancement on mass storage media or streaming video/audio services. As the main contributor to all of above, video compression technology is the focus of this paper

The rest of paper is design as follows. The overall past work is describe in Section II. Section III describes the framework of the implementation used for proposedwork. Result discussiondescribe in section IV. Finally, Section V describes the conclusion of paper.

II. LITERATURE REVIEW

K. H. Chou 2016proposed Moving Picture Experts Group-4 part-10 advanced video coding /H.264 standard uses rate distortion optimization (RDO. The experimental results show that the proposed method can reduce the computation by approximately 4.39%–48.51% with −0.003561-dB display distortion and 1.08% bitrate increment.

YanboGao et al2016 describeimproving the coding efficiency of High Efficiency Video Coding (HEVC), especially for the hierarchical coding structure defined in the Random-Access. Experimental results show that the proposed method achieves, in average, about 1.4%.BD-rate savings.

Dan Grois et al., 2013described performance comparison of the two latest video coding standards H.264/MPEG-AVC and H.265/MPEG-HEVC. H.265/MPEG-HEVC provides significant average bit-rate savings of 43.3% and 39.3% relative to VP9 and H.264/MPEG-AVC, respectively.

Deepak Dembla et al., 2011, proposeddifferent choices during the design of a CODEC and different strategies for coding control can lead to significant variations in compression and computational performance between CODEC implementations.

Shiqi Wang et al., 2011, has been found structural similarity (SSIM) index to be a good indicator of perceived image quality. Experimental results demonstrate that, compared with conventional rate distortion optimization coding schemes, the proposed scheme can achieve better rate-SSIM performance and provide better visual quality.

TomásBrandão et al., 2011, described a set of no-reference quality assessment algorithms for H.264/AVC encoded video sequences. The performances of the algorithms are evaluated using cross-validation procedures.

H. S.Prasantha et al., 2010, describe H.264/AVC (Advanced Video Coding) is the newest video coding standard of the moving video coding experts group. The paper also proposes to analyze and compare Video Quality Metrics for different encoded video sequences.

Muhammad Shafique et al., 2010, describedH.264/AVC video coding standard features diverse computational hot spots that need to be accelerated to cope with the significantly increased complexity compared to previous standards. For a MIPS processor we achieve an average speed up of approximately 60× for Motion Compensated Interpolation.

Xiaoyin Cheng et al., 2009 studied the video CODEC system and H.264 standard, as well as the rate-distortion theory. In consideration of compromising average quality and ringing artifact reduction, the distortion multiplier k between 8 and 16 is preferred.

PEO (PROGRAMME EDUCATIONAL OBJECTIVES)

The student will be able to:

PEO1 : Devise and deliver efficient solutions to challenging problems in the field of Electronics Communications Engineering and allied disciplines using engineering fundamentals.

PEO2 : Employ and reinforce their existence in reputed industrial organizations / companies by training them with soft skills, domain knowledge and managerial skills.

PEO3 : Assess and motivate young engineers to become good human being and responsible engineer for the welfare of society.

PEO4 : Develop their attitude to adapt new ideas, innovations and technologies through life long learning practices.

PSO (PROGRAM SPECIFIC OUTCOMES)

The Student will be able to:

PSO-1: Analyze, design and implement hardware and software skills to solve problems in electronics and communication engineering in various areas such as analog & digital electronics, signal processing, communication, VLSI, embedded systems and its allied branches by applying basic sciences and engineering fundamentals.

PSO-2 : Adaptability to rapid changes in the field of electronics and communication engineering and also employs their skills for the multidisciplinary work environment, to be a successful professional/entrepreneur and worthy citizen.

PROGRAMMES OFFERED

M.TECH	B.TECH	B.TECH (LEET)
DIPLOMA	DIPLOMA (LEET)	MBA
MCA	BBA	BCA

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

Bahadurgarh-Jhajjar Road,Kablana(Jhajjar)-Delhi NCR

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gitmkablana@gmail.com, enquiry@gangainstitue.com

8684000891,8684000892,8684000893,9654292946