



# Mangalore Institute of Technology and Engineering

(An ISO 9001:2015 Certified Institution)

(A Unit of Rajalaxmi Education Trust)

Badaga Mijar, Moodbidri-574225

## Department of Electronics and Communication Engineering

### Activity Report 2018-19

Sl. No.	Activity
1	International Conference on Distributed Computing, VLSI, Electrical Circuits and Robotics – DISCOVER
2	Talk on Evolution of Semiconductor Devices
3	Talk on Analog layout Design
4	Talk on Cyber Security Awareness
5	Talk on Placement Tips
6	Talk on Data mining and Data Analytics
7	Workshop on Data Analytics
8	Talk on Microcontrollers, Open source tools & Embedded applications
9	Talk on Higher Studies Opportunities in Abroad
10	Talk on Signal Processing and its Applications
11	Talk on Advancements in Artificial Neural Networks
12	Special Lecture Series on Data Analytics in Science, Engineering and Management – DASEM-18

**International Conference on Distributed Computing, VLSI, Electrical Circuits and Robotics ‘DISCOVER’**

**Date: 13<sup>th</sup> & 14<sup>th</sup> August 2018**

IEEE International Conference on Distributed Computing, VLSI, Electrical Circuits and Robotics (DISCOVER) was conducted at Mangalore Institute of Technology & Engineering (MITE), Moodbidri on 13<sup>th</sup> and 14<sup>th</sup> August 2018. The conference was jointly organized by IEEE Mangalore sub-section and MITE. The aim of the conference was to create an opportunity for the researchers of various Colleges / Universities / Industries / Research Organizations to exhibit and present their innovation, creativity and research. Dr. Tuluka Mitra, Professor, School of Computing, National University of Singapore inaugurated the conference. Prof. Alok Rastogi, Department of Electrical and Computer Engineering, The Watson School of Engineering and Applied Sciences, Binghamton University delivered a keynote address. He explained about the various semiconductor devices and the process involved in the manufacturing of semiconductor chips, non-volatile memory and photovoltaic cells. Total 130 papers were received from all over the globe. However, after three rounds of peer review, to maintain the quality of the papers 50 papers were selected for conference presentation. The conference presentation were conducted in 5 different tracks namely distributed Computing, Communication, VLSI, Electrical and Communication Circuits and Robotics.



**International Conference proceedings volume released by Dr. Tuluka Mitra, Professor,  
School of Computing, National University of Singapore**



**Keynote address by Prof. Alok Rastogi, Department of Electrical and Computer  
Engineering, The Watson School of Engineering and Applied Sciences, Binghamton  
University**



**Keynote address by Dr. Tuluka Mitra, Professor, School of Computing, National University  
of Singapore**



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### Activity Report

**Title** : Technical talk on “Evolution of Semiconductor Devices”

**Resource Person** : Dr. Alok Rastogi,  
Professor, Electrical and Computer Engineering,  
Binghamton University, USA.

**Date** : 13/08/2018

**Time** : 10.00 AM to 1.00 PM

**Target Audience** : 2<sup>nd</sup> Year Students of ECE

#### **Profile of the Speaker:**

Dr. Alok Rastogi is a Professor at the Electrical and Computer Engineering Department, State University of New York, Binghamton NY, USA. Dr. Alok Rastogi received his BS and MS from Lucknow University in Lucknow, India and his PhD in Materials Science and Engineering at the Indian Institute of Technology. He has held other positions as Research Professor at University of Massachusetts, Amherst, and Visiting Professor, University of Western Ontario, London Canada and Visiting Scientist at Waseda University, Tokyo Japan and Institute of Physical Electronics, Stuttgart Germany.

He had a long professional career at the National Physical Laboratory, India in various leadership positions. He serves on the expert panel, National Science Foundation, USA, as member of editorial board of ISRN Renewable Energy Journal and as a reviewer on behalf of various international journals. His major area of research is in physical electronics and renewable energy conversion devices and systems with focus on semiconductor, hybrid and nanomaterials based photovoltaic solar cells in thin film device structures, supercapacitor electrical energy storage and fuel cell –supercapacitor hybrid systems. His other areas of research are on advanced ferroelectric polymers and oxide materials for nonvolatile memory devices and magnetic semiconductors for spintronics.

## Keynote Address:

Dr. Rastogi gave a brief introduction about the semiconductor materials and their characteristics. He addressed the students about the invention and early developments of semiconductor materials and technology. Moving ahead he spoke about the development and improvement of the semiconductors up to the present era, including bulk processing, surface treatments, and materials analysis. Next, he discussed regarding the milestones involving the development of new concepts in semiconductor device structures. These include the basic diffused transistor, integrated circuits, new MOS devices, and new integrated circuit structures. All of these discussions were oriented toward the contributions of important materials and process of developments which enabled the new devices. Considering the present day, state-of-the-art technology involving small geometry, high packing density integrated circuits was also summarized. Moving ahead he discussed new processes primarily established since 1970 which have provided the basis for the tremendous advances in large scale integration. Some of these processes were ion implantation, various deposited dielectric films, advanced metallization systems and polycrystalline film technology, plasma and ion beam processing.

He also spoke about Very-Large-Scale Integration and the Lithographic techniques. If an attempt is made to specify how materials and process technology has been able to contribute as it has to the so-called electronics or semiconductor revolution, a few key observations may be made. One is the single crystal approach to the technology. Another is that all advances have involved the highest degree of control in material purity and structure, even though size and complexity have increased at a rapid rate. Similarly, processes and process reactants have been controlled extremely well. Instead of just making one transistor at a time, it is now possible, using the same piece of silicon and the same manufacturing process, to create many different components, including not only transistors, but also diodes (rectifiers) and resistors. This method would make possible such component combinations that would allow a whole computer to be put on a single chip of silicon as a microprocessor. In addition to larger and better silicon crystals, another prerequisite for semiconductor development was continuous improvement in photographic techniques. Integration of many components on a single chip of silicon was achieved by photographic exposure of layer after layer with a pattern that could later be etched

out to form the various components, which now number in the millions on each chip. This rapid and continuous development was characterized at an early stage by one of the pioneers, Gordon Moore, who together with Robert Noyce started Intel in 1968. What is now called Moore's Law states that the cost for raw computing power drops by 50 percent every 18 months – a trend that has held true for several decades. Finally, some future directions and trends in semiconductor technology and the process involved in the manufacturing of semiconductor chips were presented. He enlightened the students about the opportunities available for the graduates in VLSI industry.



**Technical talk on “Evolution of Semiconductor Devices” by Dr. Alok Rastogi,  
Professor, Electrical and Computer Engineering, Binghamton University, USA.**



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## Department of Electronics and Communication Engineering

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### Activity Report

**Title:** Technical talk on “Analog Layout Design”

**Resource Person:** Mr. Gopalakrishna Kallimar, Senior Layout Engineer, KarMic, Manipal

**Date:** 19/09/2018

**Time:** 10.00AM to 1.00 PM

**Target Audience:** 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year Students of ECE

**Profile of the Speaker:** Mr. Gopalakrishna Kallimar is a senior layout engineer in KarMic, Manipal. He Joined Karmic in 2009. He has 9 Years of experience and expertise in analog layouts and IO layout design. His major work contributions are in the field of Power management chips, Automobile chips, IOs for digital chips.

**Keynote address:** In his address, he enlightened the students about the opportunities available in the field of Analog circuit design & layout design. Then he briefed on the different layers in designing methodology, challenges in each layer and design optimization. He motivated the young minds with the marvels of electronics industry. He briefed the process of formulating the Integrated Chip from the design level to the fabrication process. He also explained the significance of an analog layout for various applications where the data has to be preserved in its analog form.

The active and passive components such as resistors, diodes, transistors etc. and external connections are usually fabricated in an extremely tiny single chip of silicon. All circuit components and interconnections are formed on single thin wafer (substrate) is called monolithic IC. The steps to fabricate IC chips is similar to the steps required to fabricate transistors, diodes etc. In IC chips, the fabrication of circuit elements such as transistors, diodes, capacitors etc and

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their interconnections are done simultaneously. It has many advantages such as extremely small size, small weight, low cost, low power consumption, high processing speed, easy replacement.

The silicon wafers are exposed to ultrapure oxygen. Etching removes the material selectively from the surface of wafer to create patterns. The pattern is defined by etching mask. The parts of material are protected by this etching mask. Either wet (chemical) or dry (physical) etching can be used to remove the unmasked material. To perform etching in all directions simultaneously, isotropic etching will be used. Wet etching is isotropic, but the etching time control is difficult. Wet etching uses liquid solvents for removing materials. It is not suited to transfer pattern with submicron feature size. It does not damage the material. Dry etching uses gases to remove materials. It is strongly anisotropic but it is less selective. It is suited to transfer pattern having small size. The remaining photo resist is finally removed using additional chemicals or plasma. Then the wafer is inspected to make sure that the image is transferred from mask to the top layer of wafer.

He explained the significance of an analog layout for various applications where the data has to be preserved in its analog form. Analog IC design process includes system design, circuit design, component design, circuit simulations, system simulations, integrated circuit layout design, interconnect, verification, fabrication, device debug, circuit debug, system debug. Digital IC design can be automated using CADENCE tool.



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Technical Talk on “Analog Layout Design” by Mr. Gopalakrishna Kallimar Senior Layout Engineer, KarMic, Manipal



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## Department of Electronics and Communication Engineering

### Report on Technical Talk

**Title:** Technical talk on “**Cyber Security Awareness**”

**Resource Person(s)/ Organization(s):** PRASANNA POOJARI [Alumni, ECE (2013-17Batch)], Cyber Security Engineer, DXC. Technology, Bangalore.

**Date(s):** 24/08/2018

**Duration:** 11:10 AM to 1:00 PM

**Target Audience:** 3<sup>rd</sup> year students: 5EC1 and 5EC2

**Brief about the event:** A meet with Mr. Prasanna Poojari was organized for the 5<sup>th</sup> semester students as a part of Orientation Programme to make them understand the importance of Cyber Security.

**Keynotes from the address:** Mr. Prasanna Poojari emphasized on making students fundamental knowledge strong and its importance in area of cyber security. He started the session by giving an introduction about Cyber security and its types. He addressed the following points:

- Common Threats
- Cyber-attack victims
- Some tips that will help you protect your computer
- General security tips that will help to protect our computer
- Practice Safe Browsing

He enlightened on convergence of existing technologies and corporate strategies. At the end of the session he quoted “Cyber Security Is Everyone’s Responsibility”.



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**Department of Electronics and Communication Engineering**  
Cordially invites you to the  
Alumni Interaction Session on

**"Cyber Security Awareness"**

*Chief guest*  
**Prasanna Poojari**  
Cyber Security Engineer  
DXC. Technology, Bangalore.  
**Alumni-ECE(2013-2017) Batch**  
Addressing : 5EC Students  
Date : 24-08-2018    Venue : Class room L-103    Time:11:10 am

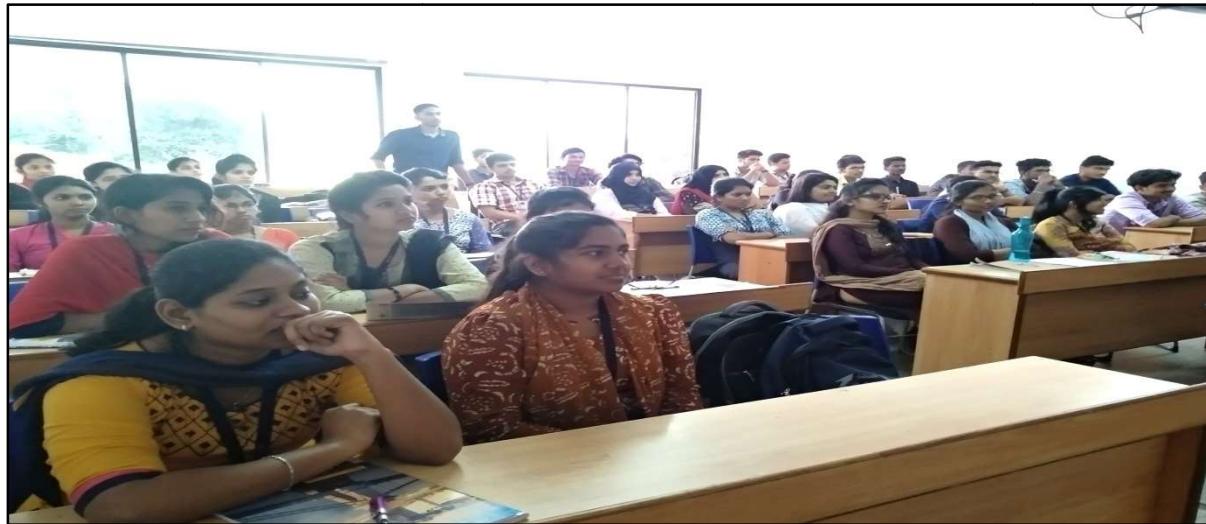


Figure 1.Mr. Prasanna Poojari during his interaction with students



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## Department of Electronics and Communication Engineering

### Activity Report

**Title:** Invited talk on “PLACEMENT TIPS”

**Resource Person(s) / Organization(s):**

**Mr. PRASANNA POOJARI, Cyber Security Engineer, DXC. Technology, Bangalore.**  
[Alumni, ECE (2013-17Batch)]

**Date(s):** 25/08/2018

**Duration:** 11:10 AM to 01:00 PM

**Target Audience:** 4<sup>th</sup> year students of ECE

**Brief about the event:**

A meet with Mr. Prasanna Pojari was organized for the 7<sup>th</sup> sem students to make them understand the importance of Placement and the various skills needs to be developed and adopted during the course of Engineering. He also shared his work experience on preparing for civil service examination with the students. He highlighted about the steps involved in campus placement drive. He also brought awareness about the various government job opportunities.

At the end of the session he interacted with the students there by clearing their doubts about placement drives.



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**Department of Electronics and Communication Engineering**  
Cordially invites you to the  
Alumni Interaction Session on

**“Placement Tips”**

*Chief guest*  
**Prasanna Poojari**  
Cyber Security Engineer  
DXC. Technology, Bangalore.  
**Alumni-ECE(2013-2017) Batch**  
Addressing : 7EC Students  
Date : 25-08-2018    Venue : Class room L-107    Time:11:10 am



Figure 1. Interaction of alumni Mr. Prasanna Poojari with the students



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## Department of Electronics and Communication Engineering

### Activity Report

**Title:** Technical talk on “Data Mining and Data Analytics”

**Resource Person:** Prof. Sangwon Yoon, Binghamton University, USA.

**Date:** 04/10/2018

**Time:** 09.00AM to 2:00PM

**Target Audience:** 3<sup>rd</sup> year Students of ECE

**Profile of the Speaker:** Prof. Sang Won Yoon is an Associate Professor in Systems Science & Industrial Engineering, Binghamton University, USA. He has obtained a Doctoral Degree from Purdue University, United States. His research interest includes Integrated Production & Service Systems, Healthcare Systems Engineering, Decentralized Decision Modeling, Collaborative Control Theory and Enterprise Collaboration. Professor has published several research articles in reputed journals, having a highest citation of 1030.

**Keynote address:** Professor Sang Won elucidated on Data Analytics Framework and Application in detail. Topics covered are the characteristics of real-life data sets, how to discover meaningful knowledge from it, how to integrate, pre-process, transform and analyze data. Learn various machine learning algorithms for classification and clustering. Apply data mining & analytics techniques to develop intelligent systems to solve real-world problems.

Session helped students in gaining a general understanding of data mining & analytics techniques. He explained the concepts associated with data analytics in practice, learn tools in use in data mining areas, various areas of advanced analytics including clustering, statistical regression model, classification, etc.

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Professor Sang won given detailed presentation on pictorial and tabular methods in descriptive statistics, foundation of probabilities, discrete random variables, probability distribution and important theorems.

Then professor Sang won briefed on Pictorial and Tabular Methods including Stem & Leaf, Histograms, Box Plot. He highlighted the information's captured form **Stem & Leaf** are average location, spread, gaps, peaks and outliers. A **histogram** is a bar graph of raw data that creates a picture of the data distribution. The bars represent the frequency of occurrence by classes of data. A **histogram** shows basic information about the data set, such as central location, width of spread and shape. The **box plot** is a standardized way of displaying the distribution of data based on the five number summary that is minimum, first quartile, median, third quartile, and maximum. Axioms of probabilities are explained along with example exercises, permutations, combinations, conditional probabilities and law of total probabilities were also discussed.

Professor explained the applications of **Bayes' theorem** in Bayesian inference, a particular approach to statistical inference. When applied, the probabilities involved in Bayes' theorem may have different probability interpretations. With Bayesian probability interpretation, the theorem expresses how a degree of belief, expressed as a probability. **Chebyshev's theorem** is explained to find the proportion of observations that we expect to find within two standard deviations from the mean.

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**Technical talk on “Data Mining and Data Analytics” by Prof. Sangwon Yoon, Binghamton University, USA**



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## Department of Electronics and Communication Engineering

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### Activity Report

**Title: Three Day Short Term Course on “Data Analytics”**

**Resource Person: Prof. Sangwon Yoon, Binghamton University, USA.**

**Date: 04/10/2018 to 6/10/2018**

**Time: 09.00AM to 4.30 PM**

**Target Audience: 3<sup>rd</sup> and 4<sup>th</sup> year Students of ECE**

**Profile of the Speaker:** Prof. Sang Won Yoon is an Associate Professor in Systems Science & Industrial Engineering, Binghamton University, USA. He has obtained a Doctoral Degree from Purdue University, United States. His research interests includes Integrated Production & Service Systems, Healthcare Systems Engineering, Decentralized Decision Modeling, Collaborative Control Theory and Enterprise Collaboration. Professor has published several research articles in reputed journals, having a highest citations of 1030.

**In Day 1, session 1,** Professor elucidated on Data Analytics Framework and Application in detail. Topics covered are the characteristics of real-life data sets and how to discover meaningful knowledge from them; how to integrate, pre-process, transform, and analyze data; Learn various machine learning algorithms for classification and clustering; Apply data mining & analytics techniques to develop intelligent systems to solve real-world problems.

Session helped students in gaining a general understanding of data mining & analytics techniques; concepts associated with data analytics in practice; learn tools in use in data mining areas; various areas of advanced analytics including clustering, statistical regression model, classification, etc.

**In Day 1, session 2,** Professor provided detailed presentation on pictorial and tabular methods in descriptive statistics; foundation of probabilities; discrete random variables and probability distribution and important theorems.

Pictorial and Tabular Methods are explained including Stem & Leaf, Histograms, Box Plot. He highlighted the information's captured form **Stem & Leaf** are average location, spread, gaps,

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peaks and outliers. A **histogram** is a bar graph of raw data that creates a picture of the data distribution. The bars represent the frequency of occurrence by classes of data. A **histogram** shows basic information about the data set, such as central location, width of spread, and shape. The **box plot** is a standardized way of displaying the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum.

Axioms of probabilities are explained along with example exercises, permutations and combinations, conditional probabilities and law of total probabilities were also discussed.

Professor explained the applications of **Bayes' theorem** in Bayesian inference, a particular approach to statistical inference. When applied, the probabilities involved in Bayes' theorem may have different probability interpretations. With Bayesian probability interpretation, the theorem expresses how a degree of belief, expressed as a probability. **Chebyshev's theorem** is explained to find the proportion of observations that we expect to find within two standard deviations from the mean.

**In Day 2, session 1,** Prof. Song Won Yoon explained about Data Collection, Data Visualization, Data Pre-processing, Data reduction, Principal Component Analysis and Feature Selection.

Professor explained the systematic gathering of data for a particular purpose from various sources. Types of data are Numerical (age, weight, number of children's etc) and categorical (eye color, blood type, gender etc).

Data visualization aims to communicate data clearly and effectively through graphical representation. Professor explained the pixel oriented, hierarchical visualization, geometric projection and icon based visualization techniques.

Importance of data cleaning, data integration, data transformation, data discretization, data reduction are explained in this session.

**Principal Component Analysis** is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components.

**In Day 2, session 2,** Professor presented topics including, regression, simple linear regression, multiple linear regression and logistics regression.

**Regression** is a statistical measurement used in finance, investing, and other disciplines that attempts to determine the strength of the relationship between one dependent variable and a

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series of other changing variables. Professor described the two regression models, linear and non-linear regression.

**Logistic regression** is a statistical model that in its basic form uses a logistic function to model a binary dependent variable, although many more complex extensions exist. In regression analysis, logistic regression is estimating the parameters of a logistic model.

**In Day 3, session 1,** Professor explained Naive Bayes Classifier, Artificial Neural Networks and Support Vector Machine. **Naive Bayes classifiers** are a collection of classification algorithms based on Bayes' Theorem. It is not a single algorithm but a family of algorithms where all of them share a common principle, i.e. every pair of features being classified is independent of each other. Professor expressed that Naive Bayes Classifier is easy to implement and provides good results.

**Artificial Neural Networks** are computing systems vaguely inspired by the biological neural networks that constitute animal brains. Such systems "learn" to perform tasks by considering examples, generally without being programmed with task-specific rules. Feed forward and feedback neural networks are explained. In machine learning, **Support-Vector Machines** are supervised learning models with associated learning algorithms that analyze data used for classification and regression analysis.

**In Day 3, session 2,** Professor explained, Moving Average Forecasting Method, Exponential Smoothing, Forecasting with Trend and Forecasting with Seasonality. Classification Performance Evaluation, Under fitting and over fitting, Measure matrix estimations were also discussed.

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Figure 1: Prof. Song Won Yoon Presenting Forecasting Applications.



Figure 2: Three Days Short Term Course on Data Analytics



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## Department of Electronics and Communication Engineering

### Activity Report

**Title** : Technical talk on “Microcontrollers, Open-Source Tools & Embedded Application”

**Resource Person** : Mr. Mohammed Sadiq,  
Director, Tech-Graylogix, Mangalore.

**Date** : 15/11/2018

**Time** : 11.00 AM to 04.00 PM

**Target Audience** : 3<sup>rd</sup> Year Students of ECE

#### **Profile of the Speaker:**

Mr. Mohammed Sadiq is working as a Director of Tech-Graylogix Mangalore. Mr. Mohammed Sadiq is having 12 years of experience in design and development of embedded electronics applications. Tech-Graylogix provides hardware and embedded software development, customized product design, sales/marketing of embedded products/services, web designing and server management.

#### **Keynote address:**

In his address, Mr. Sadiq spoke on the aspects of selecting microcontroller depending upon the need, requirements, ambiance, number of I/O peripherals, power management and speed of process commands. He briefed on the functionality of vital electronic components, importance of regulated power supply and voltage comparators in sensor design, relay switching mechanism from heavy loads. He also inspired & motivated the students to make use of Microcontrollers in their academic/innovative projects.

He started the session by explaining the history of Microcontrollers starting from 8 bit and 16 bit Microcontroller, their memory organisation, parallel and serial I/Os, Timers and Signal generators, ADC and DAC devices. He stated that 16-bit microcontroller has greater precision and higher performance as compared to 8-bit controller. It can automatically operate on two 16 bit numbers. Examples of 16-bit microcontroller are 16-bit MCUs such as extended

8051XA, PIC2x, Intel 8096 and Motorola MC68HC12 families. He also briefed about 32-bit microcontroller which can perform the arithmetic and logic operations. They are used in automatic control devices including implantable medical devices, engine control systems, office machines, appliances and other types of embedded systems with the examples of Intel/Atmel 251 family, PIC3x.

He explained the programming of Microcontroller using Keil C51, a popular compiler that creates apps for 8051 microcontrollers and translates source code written in the C language into machine language. He briefed how to design and develop the system components that meet the specific needs, such as implementation of Wi-Fi trans-receivers in embedded systems. He also explained the various of sensors such as, IR, LDR, PIR, Thermistor, Piezo buffers and their real-time applications. Finally, he briefed about the different types of open source tools available such as IDE for Arduino, Board package for STM32, Energia –IDA for MSP430.



**Technical talk on “Microcontrollers, Open-Source Tools & Embedded Application”  
by Mr. Mohammed Sadiq, Director, Tech-Graylogix, Mangalore**



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## Department of Electronics and Communication Engineering

### Activity Report

**Title:** Invited talk on “Higher study opportunities in Abroad”

**Resource Person:** Mrs. Priya K, Operations Head, Planet Education, Manipal

**Date:** 18/02/2019

**Time:** 9.00AM to 4.00 PM

**Target Audience:** 3<sup>rd</sup> and 4<sup>th</sup> year Students of ECE

**Profile of the Speaker:** Mrs. Priya K is working as an Operations Head at Planet Education, Manipal. She is having more than 13 years of experience in strategic direction of higher education. She has counseled more than 10000 students interested to go for higher studies to all countries around the globe. She help the students to achieve their dreams of being globally competitive professionals by guiding and assisting them in admissions into internationally reputed universities and colleges.

**Keynote Address:** In her address, she enlightened the students about higher study opportunities in Abroad is not just an indicator of prestige and quality, but also a good investment in future. She also explained how to take steps at starting point on the path of building a successful career and how to build a unique opportunity to gain invaluable knowledge, skills, and Innovation, job requirements, internships.

Then she briefed on various high ranked universities across different countries such as, Australia, Canada, New Zealand, UK, Ireland, USA, and Singapore. She briefed the students about fantastic opportunities for realizing their dreams of pursuing foreign education, through honest and credible advice and assistance.

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**STUDY IN AUSTRALIA:** Australia is one of the most desired destinations for education among international students. Each academic year, more than 700,000 international students choose to study in Australia as the Australian Education System is highly recognized and valued all over the world. The quality education, easy access to student support services, multicultural society and an amazing lifestyle make Australia an attractive study destination. Australia is a melting pot of culture and It is known as the land of opportunities, the place which is full of avenues for students interested in varied disciplines. From specializations to interdisciplinary studies, the education system encourages students to explore their interests and understand where their passion. **Scholarship Opportunities:** Australian Government has invested over \$300 million in scholarships for international students. Australia offered over 3,000 Australia Awards scholarships and short courses to students from over 55 countries.

**Work while Study:** Australian universities provide an education designed to help the students succeed in the real workforce. While studying, student can work up to 20 hours per week during the semester and full-time during the semester break. This can be a great way to find study-related work. **Post study work permit:** Once student complete a Bachelor, Master, or PhD degree, they are eligible for a Post-Study Work permit under the Temporary Graduate visa. This allows them stay back in Australia temporarily after they studies to gain practical experience working in their field. **Permanent Residency Possibility:** After studying in Australia, one can be eligible for applying for Permanent Residency.

**Study in United Kingdom:** The UK has an excellent reputation as an international study destination with world-class career prospects, among the world best facilities and a multicultural student community which make it unarguably the best choice for students who aspire to pursue studies abroad. Students are eligible for a two year work permit after they complete their course. **Opportunity for Research, Teaching and Training:** Research-based learning and education are actively encouraged. If students are looking to challenge them self intellectually and academically.

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**Scholarships:** If student is a meritorious, they could very well be on the receiving end of scholarships and grants. **Global Education and Long-Term Career Prospects:** The US, with 16 institutions, dominates the world top 20 universities list. 52 US universities are ranked amongst the top 100 universities worldwide 77 American universities are ranked amongst the best 200 universities in the world. If student have always dreamt of working in a large multinational, head to the US where 1.28 of the 500 largest companies in the world are headquartered.

**Academic Excellence:** U.S. degrees are recognized all over the world for their excellence. It is one of the world finest university systems with outstanding programs and international recognition. **Cutting-Edge Technology :** For decades now, the USA has led in many areas of cutting-edge technology and research. As a result, students interact with potential and current leaders in their field during the course of study. The USA offers some of the most innovative and path breaking STEM courses on Science, Technology, Engineering and Math.

**STUDY IN CANADA:** Canada is a top international education destination for its world-class universities and colleges. The state controls the education sector, thus ensuring that the standard of the educational institutions is top notch. Education in Canada is high quality of teaching, close interaction between teachers and students, special attention to research work. At the same time, studying in Canada costs on average cheaper than in the UK or the US. Canada is one of the leaders in engineering, humanities, natural sciences and high technologies courses.

**Great Employment Opportunity:** According to statistics, over 90% of graduates of Canadian universities and colleges end up being employed in their field of study within six months of graduating. Graduates from a Canadian university or an institution have the opportunity to work in Canada for up to two years post completion of the study. **High Research Value:** More than 200,000 international students and researchers choose to study in Canada each year. **Practical approach:** An important advantage and perhaps the main achievement of Canadian education is its orientation to practice. The main thing here is not money but the fact that the student is

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gaining practical experience and the fact that many employers hire students for permanent positions after the internships.

**World Recognition:** A number of Canadian universities regularly appear in prominent world ranking systems. Qualification from Canadian universities is highly recognized and valued internationally.

**A High Tech Country:** Canada has a highly globalised economy. Usually, educational institutions are located on large campus territories, all of them have the modern high-tech equipment, comfortable student hostels, sports halls, small class sizes and highly qualified teachers which make studying in Canada really interesting, high-quality and effective.

**Affordable tuition fee and living costs:** Canadian institutions typically charge comparatively affordable fees. The cost of studying in Canada is 35 – 40% cheaper than in Europe and almost 2 times cheaper than in the UK. The cost of living is 20-25% lower than in the neighbouring US. **Work during Study:** International students are allowed to work 20 hours a week, both on and off campus, when the semester is on and full-time during vacations.

**STUDY IN NEW ZEALAND:** New Zealand has been emerging as an attractive destination for international students. Attractive not just in terms of the quality of education but also in natural beauty

**A welcoming destination:** New Zealand is considered to be one of the most stable economies in the OECD network. **Beautiful location:** A natural playground is an apt term for New Zealand.

Students are not far from nature even in the biggest cities. **Work during and post study :** Foreign students can work up to 20 hours a week during the semester and full time during vacations i.e. 40 hours. **A high quality learning experience:** The education system in New Zealand is modeled after the British system. This means it is globally recognized and acknowledged everywhere.

**A quality degree which is recognized globally:** The country has a centrally managed quality assurance system. All institutions that enroll international students must be registered and must follow stringent rules that maintain high standards of quality and

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care. New Zealand qualifications are not just of a high quality they have a reputation for being practical, modern, and economical too.

## STUDY IN SINGAPORE:

**Positive Atmosphere:** Life in Singapore can be inspiring since the city is known for its high level of productivity and positive work attitude. **International Opportunities:** Singapore's regional positioning means that it serves as a gateway to countries such as Malaysia, Thailand, Indonesia, Brunei and the Philippines.

**STUDY IN IRELAND:** Ireland is famous for its high level of education. Ireland used to be called the “Island of Saints and Scientists”. Ancient culture, millennial traditions, research environment, education initiatives, job opportunities and international outlook of the “Emerald Island”. In the past two decades, Government of Ireland has invested heavily in education.

**High quality of Education:** The Irish National Framework of Qualifications (NFQ) is responsible for maintaining quality standards and helps international students receive the best education and training. **High quality of life:** Ireland has a high quality of life, ranking first in the Economist Intelligence Unit Quality-of-life index. **Ireland is at the cutting edge of science and technology:** Higher education in Ireland distinguishes particular attention to research work. The National Development Plan (NDP) and the Strategy for Science, Technology & Innovation (SSTI) invested a total of €8.2 billion in research and development during last 3 years. Fortune Magazine named Ireland as one of the seven best countries for start-ups.

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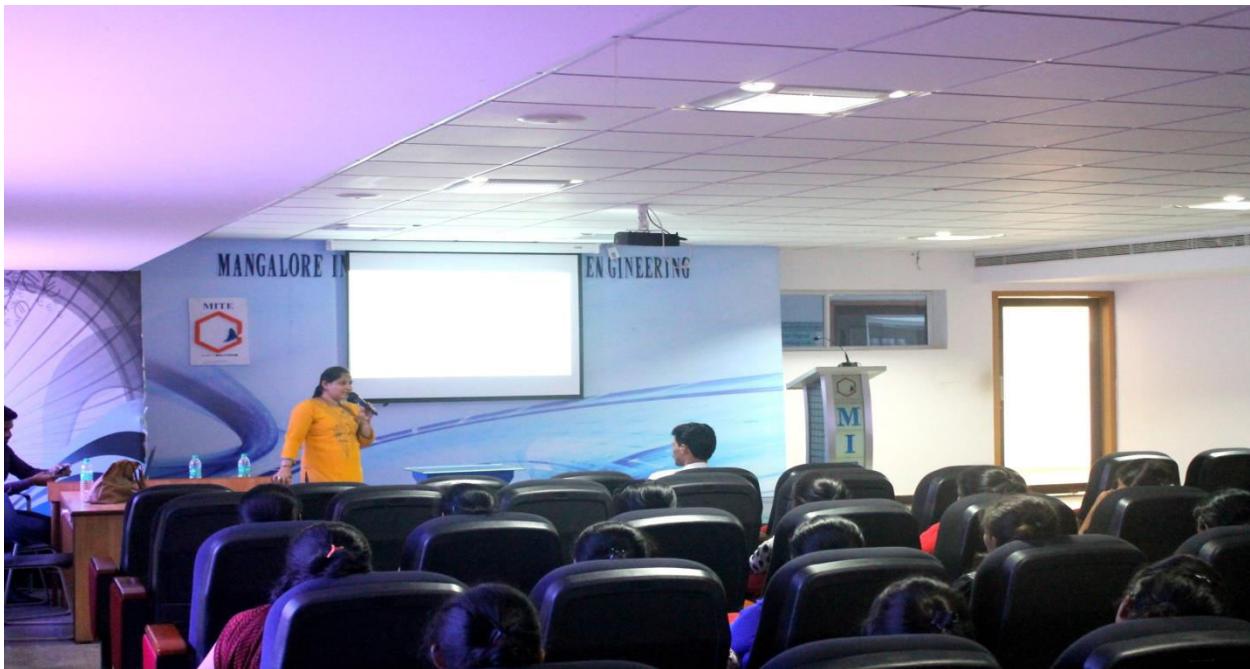


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Invited talk on “Higher study opportunities in Abroad” by Mrs. Priya K,  
Operations Head, Planet Education, Manipal



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## Department of Electronics and Communication Engineering

### Activity Report

**Title** : Technical talk on “Signal Processing and its Applications”

**Resource Person** : Dr. Niranjan U. C,  
Director Research and Training,  
Manipal Dot Net, Manipal.

**Date** : 12/03/2019

**Time** : 02.00 PM to 05.00 PM

**Target Audience** : 2<sup>nd</sup> Year Students of ECE

### **Profile of the Speaker:**

Dr. Niranjan U. C. is Director of Research and Training at MDN. He brings more than 18 years of experience and passion in signal-processing. Well known as a teacher and senior researcher, his students have spread far and wide. He was a visiting researcher at Parama Tech Biomonitoring Institute, Fukuoka, Japan in 1994 and 1996. He has been teaching at various levels at the Manipal Institute of Technology since 1986, and is currently a registered PhD advisor at the Manipal University. He was guest faculty at Mangalore University, NMAMIT Nitte, and Karmic Manipal.

Dr. Niranjan is a Senior Member of the IEEE and the past national secretary of the Biomedical Engineering Society of India. He has served on the technical program committees of a number of conferences and workshops including IEEE-EMBS Annual Conference, 1998, Hongkong, National Conference on Biomedical Engineering, 2001, Bangalore and National Conference on Knowledge Based Frontier Technologies, 2007, Manipal. He has published over 40 Journal and conference papers. He was winner of the Whitaker Foundation student paper competition in IEEE-EMBS Conference, Paris 1992 and the Young Investigator Award, ICSE Conference, Arizona 1996.



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Dr. Niranjan holds a PhD in Electrical Science from the Indian Institute of Science, Bangalore; M. Tech from KREC Surathkal and Bachelors in Electronics and Communication from the Gogte Institute of Technology Belgaum. A multifaceted personality, he also speaks German and Japanese, translates Vachanas of Basavanna, manages the Veera Shaiva Jangama Mutt and the Chitrakala Mandira Art School in Udupi.

## **Keynote Address:**

In his address, he gave an insight about the various types of Signal processing, DSP Applications, De-Interlacing and Filtering. He explained the need of Discrete Fourier Transform to represent and analyze the signals in frequency domain. He also demonstrated the use of Discrete Cosine Transform in image processing applications. He motivated the students to learn the basic concepts of Signals and Systems in order to understand the Electronics and Communication concepts more clearly.

Dr. Niranjan briefed about the signal processing and signal extraction with respect to time and need of filtering action to be carried out with the sample of original ECG signal 60/50Hz filtering operation by taking Transform analysis in filtering. Then he discussed about Discrete Fourier Transform & Signal Representation in Time and Frequency Domain.

He inspired the students by explaining the concept of Discrete Cosine Transformation which is applied in image reduction by correlation and energy compaction method. Threshold coding done using quantization matrix. In coding techniques, he has given an idea about Zig-Zag encoding with coefficient, sequence variable length coding with DC differences.

The session has helped the students to realize and understand the concept and applications of continuous and discrete time signal processing and laid a solid foundation for the study of practical applications such as the analysis and design of analog and digital filters.

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**Technical talk on “Signal Processing and its Applications” by Dr. Niranjan U. C,  
Director Research and Training, Manipal Dot Net, Manipal.**



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## Department of Electronics and Communication Engineering

### Activity Report

**Title** : Technical talk on “Advancements in Artificial Neural Networks”

**Resource Person** : Dr. Niranjan U. C,  
Director Research and Training,  
Manipal Dot Net, Manipal.

**Date** : 12/03/2019

**Time** : 11.00 AM to 01.00 PM

**Target Audience** : 3<sup>rd</sup> Year Students of ECE

#### **Profile of the Speaker:**

Dr. Niranjan U. C. is Director of Research and Training at MDN. He brings more than 18 years of experience and passion in signal-processing. Well known as a teacher and senior researcher, his students have spread far and wide. He was a visiting researcher at Parama Tech Biomonitoring Institute, Fukuoka, Japan in 1994 and 1996. He has been teaching at various levels at the Manipal Institute of Technology since 1986, and is currently a registered PhD advisor at the Manipal University. He was guest faculty at Mangalore University, NMAMIT Nitte, and Karmic Manipal.

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Dr. Niranjan holds a PhD in Electrical Science from the Indian Institute of Science, Bangalore; M. Tech from KREC Surathkal and Bachelors in Electronics and Communication from the Gogte Institute of Technology Belgaum. A multifaceted personality, he also speaks German and Japanese, translates Vachanas of Basavanna, manages the Veera Shaiva Jangama Mutt and the Chitrakala Mandira Art School in Udupi.

## **Keynote Address:**

In his address, he briefed the students about the various aspects of Artificial Neural Network (ANN) and its advancements. He also inspired the students to make use of ANN algorithms in their academic projects.

Artificial Neural Networks are the computational models that are inspired by the human brain. Many of the recent advancements have been made in the field of Artificial Intelligence, including Voice Recognition, Image Recognition, Robotics using Artificial Neural Networks. Artificial Neural Networks, in general – is a biologically inspired network of artificial neurons configured to perform specific tasks. These biological methods of computing are considered to be the next major advancement in the Computing Industry.

When Neural Networks are used with a fewer number of processing units and weights, software simulation is performed on the computer directly. Example, Voice recognition when Neural Network Algorithms are developed to the point where useful things can be done with 1000's of neurons and 10000's of synapses, high-performance Neural Networks hardware will become essential for practical operation. GPU (Graphical Processing Unit) is an another example in the case of Deep Learning algorithms in the event of object recognition, image classification, etc.

The neural network learns by adjusting its weights and bias (threshold) iteratively to yield the desired output. These are also called free parameters. For learning to take place, the Neural Network is trained first. The training is performed using a defined set of rules also known as the learning algorithm. He inspired the students by giving the examples of Real-Time applications

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such as Automatic License Plate Recognition, Face recognition and Video processing using ANN algorithms.



**Technical talk on “Advancements in Artificial Neural Networks” by  
Dr. Niranjan U. C, Director Research and Training, Manipal Dot Net, Manipal.**

**Title: Two Day Special Lecture Series on “Data Analytics in Science, Engineering & Management (DASEM -18)”**

**Date: 28/09/2018 and 29/09/2018**

**Target Audience: Students interested on Data Analytics**



**Introduction**

Karnataka Science and Technology Academy (KSTA), Department of Science and Technology (DST), Government of Karnataka (GoK) sponsored two day Special Lecture Series was conducted by the Department of Electronics & Communication, MITE, Moodbidri, D K District, Mangalore on Data Analytics in Science, Engineering & Management (DASEM -18) on 28th and 29th September 2018.

The program commenced with honorable speaker Dr. N. V. Subba Reddy, Professor & Head, Computer Science Engineering, MIT, Manipal. Dr. M. S. Nagananda in consort with the Principal Dr. G.L Eswara Prasad and Head of the Department, Prof. Sathisha.

**Session 1:**

Speaker: Dr. N. V. Subba Reddy, Dept. of CSE, MIT, Manipal

Topic: Data science and application of AI-based learning

Date & Time: 28-09-2018, 10.00 A.M- 1.00 P.M

Dr. N. V. Subba Reddy spoke on automation, its leading trends, development and future. He specifically spoke on automation in the field of agriculture, how advancement in automation is creating a job scarcity and at what rate it is affecting certain major sector.

In first session, he spoke on the basics of AI and explained about its structure part by part as in how each module or components of AI work and how they are interconnected and how the components are interrelated. As an over view the talk was very informative and opened the doors of AI into their lives. People with misleading assumption about AI were cleared. The talk ended with a questionnaire where the audience were given the chances to get their doubts cleared about the topic.



Lecture on “Data science and application of AI-based learning models”  
by Dr. N. V. Subba Reddy, Dept. of CSE, MIT, Manipal

The 2<sup>nd</sup> half of the session was taken over by Prof. Roshan David Jathanna, Associate Professor, CSE, MIT, Manipal. He took the topic a little further with a little higher level of understanding about the topic. He demonstrated practically how a simple AI system works & also introduced the audience about a simple tool **WEKA** for trying out one's own programs and logic. He lifted the level of understanding from logical thinking to practical thinking. It was easy for the audience to cope up effectively because they had some idea about the topic from the first session. This session too ended with a questionnaire with an active response from the audience. Overall both the sessions were very informative, interactive and eye opener to the outside world with respect to upcoming development in technologies, gadgets and the opportunity that lie ahead of us.

### **Day 1, Session 3 & 4:**

Speaker: Dr. M. R. Arulalan, Dept of Electronics & Communication, NITK , Surathkal

Topic: Linear Algebra background for Data Analytics

Date & Time: 28-09-2018, 2.00 P.M- 4.45 P.M

The speaker Dr. M. R. Arunlalan, began with the introduction to Linear Algebra. Firstly, he explained the basics of linear algebra and its applications. How determinant is related to the area and volume of parallelogram. He then spoke about the rank. Cramer's rule to find two unknowns in an equation. He even gave real time examples so that we could understand the concept better.

In Session 4, He spoke about Probability, Sample Space, and Events. He made the participant to understand the concept by providing dice example. Then explained about rules of Probability, Baye's rule and random variables. This session too ended with a questionnaire with an active response from the audience.



Lecture on “Linear Algebra background for Data Analytics” by Dr. M. R. Arulalan,  
Dept of Electronics & Communication, NITK, Surathkal

**Day 2, Session 1:**

Speaker: Dr. Amit Sen Gupta, Adjunct Professor, IIT Delhi

Topic: How to collect the community based data in rural areas.

Date & Time: 29-09-2018, 9.30A.M- 11.30 A.M

The second day of Two Day Lecture Series was started with the session on “Collection of Quantitative Data”. Dr. Amit Sen Gupta spoke on what are quantitative data and the purpose of collecting the data. He specially spoke on data management from which the society is benefitted. He even spoke about the difference between the western culture, eastern culture and the complexity in the management of problems which include maternal and neonatal deaths. He mentioned the steps to overcome these problems through “epidemiological studies” by using Bio-informatics, Computer Science and Statistics.



Lecture on “How to collect the community based data in rural areas”  
by Dr. Amit Sen Gupta, Adjunct Professor, IIT Delhi

**Day 2, Session 2:**

Speaker: Dr. Pavanaja, Vishwa Kannada, Bengaluru.

Topic: Computers and Indian Languages, how to write Kannada articles in Wikipedia

Date & Time: 29-09-2018, 11:30 AM -1:20 PM

The session commenced by Dr. U. B. Pavanaja on the topic “Writing for Wikipedia and analyzing”. He began the talk by quoting of Rabindranath Tagore “Where the mind is without fear and the head is held high”. From the verse of this poem he highlighted on one of the verse which said where knowledge is free. He spoke about what is Wikipedia. He then spoke on how Wikipedia works and who manages the website. He then explained who edits the information present in Wikipedia and who can upload article on Wikipedia. He explained that every individual can edit articles on Wikipedia with and without making one’s own profile on Wikipedia. He then spoke on importance of language. He stressed on how to preserve Indian language and how we can popularize Indian languages on Wikipedia. He then spoke on the endangered and lost languages and what we can do to save

those endangered languages. He did not just constrict to what we can do as an active Wikipedia editor or user. So it is not waste of one's time rather a part of learning and acquiring knowledge and wisdom.



Lecture on “How to write Kannada articles in Wikipedia” by Dr. Pavanaja, Vishwa Kannada,  
Bengaluru

### **Day 2, Session 3:**

Speaker: Dr. Amit Sen Gupta, Adjunct Professor, IIT Delhi

Topic: Specific models and methods to develop risk criteria

Date & Time: 29-09-2018, 2.15 P.M- 3.30 P.M

Dr. Amit Sen Gupta enlightened the people about different machine learning techniques like K-Neighbors, Naive bayes etc. He also spoke about usage of fuzzy logic for medical diagnosis. He guided the participants about how to build different models and techniques be used for maternal death prevention.

He explicitly explained about the projects he guided taking an example of detecting amount of carbon dioxide in fetus. Data mining models using center design and expert design for analysis was explained.



Lecture on “Specific models and methods to develop risk criterias by Dr. Amit Sen Gupta,  
Adjunct Professor, IIT Delhi