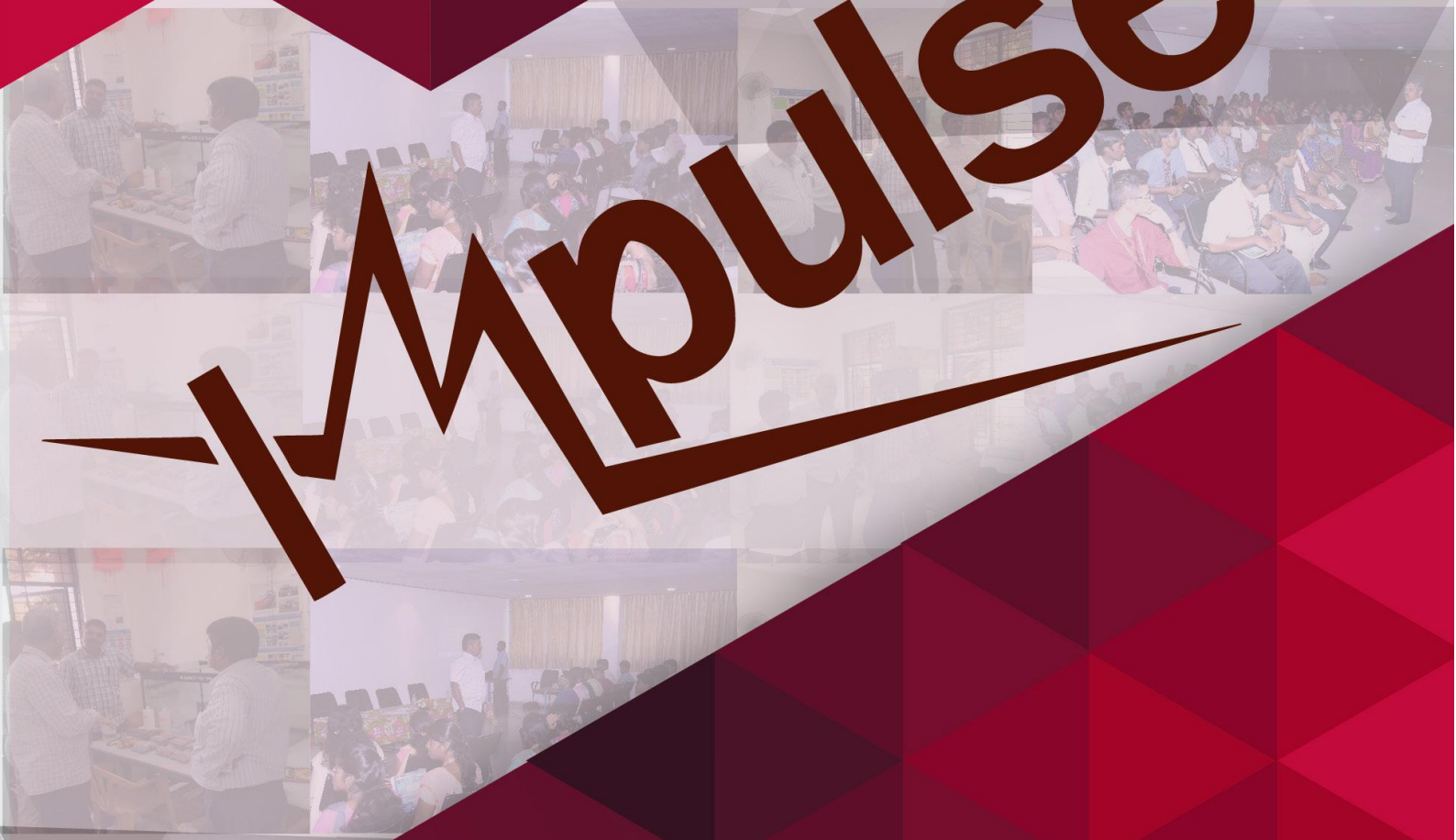
VOLUME 7 ISSUE 2

June 2018 - November 2018

Impulse



DEPARTMENT OF ECE

HALF-YEARLY NEWSLETTER

EDITORS' NOTE

Dear Readers,

On behalf of Department of ECE, SSN College of Engineering, it gives us immense pleasure to present this edition of the IMPULSE magazine. This magazine, in addition to being a repository of knowledge and information, is a forum for open exchange of ideas for all. It focuses on the incredible achievements of our students, staff and alumni in curricular, co-curricular and extra-curricular spheres. We hope that the magazine is informative, inspiring and engaging to all our readers.

It was both exciting and an exigent point being the Editors of this edition of the IMPULSE Magazine.

We would like to express our profound gratitude to the Faculty Co-ordinators and the Faculty In-Charge for helping and guiding us in every step of making this magazine. We would also like to thank our entire team who have worked tirelessly to ensure this magazine is impeccable - content and design wise.

"The best preparation for tomorrow is doing your best today."

Nikhilesh N, IV B
S Rakshana , IV B

MEET THE TEAM

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We're back again with another issue of Impulse magazine! So much has happened in the last semester that will have you hooked to the magazine for hours. Before we launch into the magazine, let's take a moment to know the hardworking team behind this terrific edition of Impulse!

Contents

INVITED ARTICLE

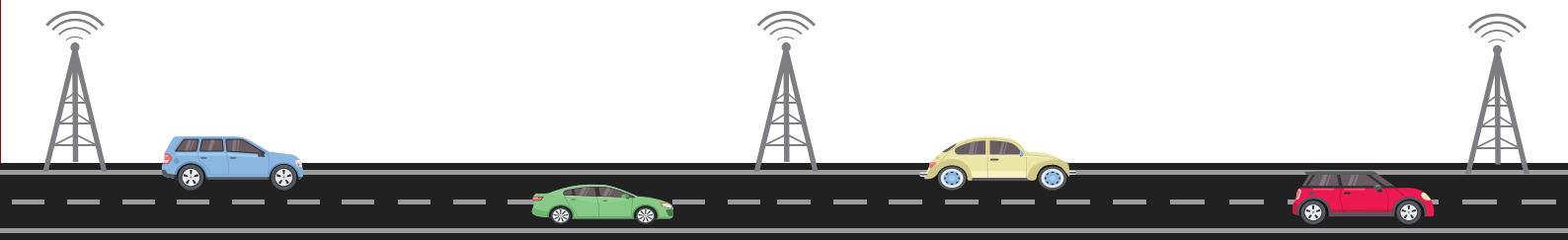
Vehicular Ad hoc Networks (VANETS) & Evolution of Internet of Vehicles (IoV)

- Dr. Edna Elizabeth.N
Professor
ECE Department

I. Overview of Vehicular communication

In earlier days people use to communicate with one another through various means such as birds, fire, voice-echo, etc. Later on slowly as the years passed by due to technology development communication started via telephone, telegraphy, letters, etc… But then people wanted to do things faster and communicate faster and so many electronic gadgets came into existence and people started communicating via cell phones and internet. These are all the possible and useful ways of communication while the person is in dynamic state.

Further in order to communicate while travelling by car, train and bus, etc.. Communication became necessary and to be established without any loss of signals. Thus Vehicular communication came into existence and in order to have a network among the vehicles, ad hoc networking became possible. The importance of ad hoc networking among vehicles is to avoid accidents and also to avoid delay in our day to day activities.



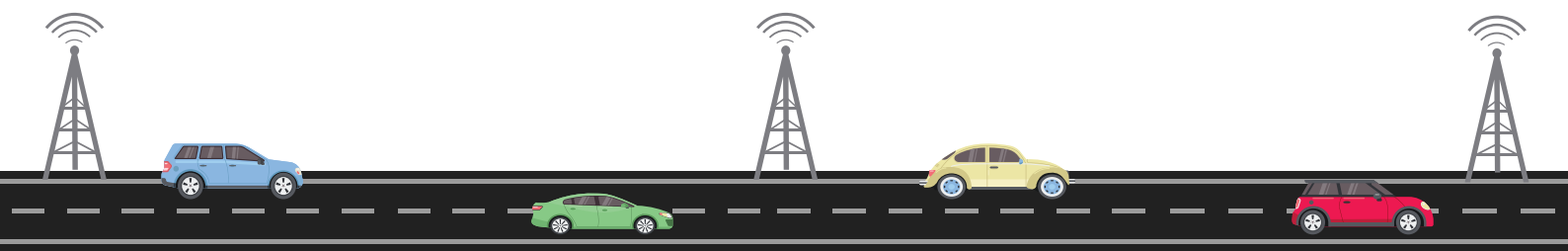
II. What is V2X communication?

Communication is the passing of information from a vehicle to any entity that may affect the vehicle, and vice versa. Cars are becoming ever more connected to other cars, to transport infrastructure, to pedestrians, and to datacentres. But which standards will underpin this entire 'vehicle to everything' (V2X) communication? There are different types of communications under V2X (Vehicle to everything). It is a vehicular communication system that incorporates other more specific types of communication as V2I (Vehicle-to-Infrastructure), V2N (Vehicle-to-network), V2V (Vehicle-to-vehicle), V2P (Vehicle-to-Pedestrian), V2D (Vehicle-to-device) and V2G (Vehicle-to-grid).
The main motivations for introducing V2X are road safety, traffic efficiency, and energy savings. In terms of technology, there are two types of V2X communication technology used based on:

1) WLAN based, and
2) Cellular based.

Standardization of WLAN based V2X supersedes that of cellular based V2X system. In the year 2012, IEEE first published the specification of WLAN based V2X (IEEE 802.11p)
It supports direct communication between vehicles (V2V) and between vehicle and infrastructure (V2I). DSRC uses the underlying radio communication provided by 802.11p.

In 2016, 3GPP published V2X specifications based on LTE as the underlying technology. It is generally referred to as "cellular V2X" (C-V2X) to differentiate itself from the 802.11p based V2X technology. In addition to the direct communication (V2V, V2I), C-V2X also supports wide area communication over cellular network (V2N). This additional mode of communication and native migration path to 5G are two main advantages over 802.11p based V2X system. The direct communication between vehicle and other devices (V2V, V2I) uses so-called PC5 interface. PC5 refers to a reference point where the User Equipment (UE), i.e. mobile handset, directly communicates with another UE over the direct channel. In this case, the communication with the base station is not required.
As of December 2017, only a single European automotive manufacture has announced an intention to deploy V2X technology based on 802.11p from 2019 [2]. Recent study and analysis in 2017[2] and 2018[3] indicate that cellular based C-V2X technology in direct communication mode is superior to 802.11p in multiple aspects, such as performance, communication range, and reliability.



III. Need for V2X Communication

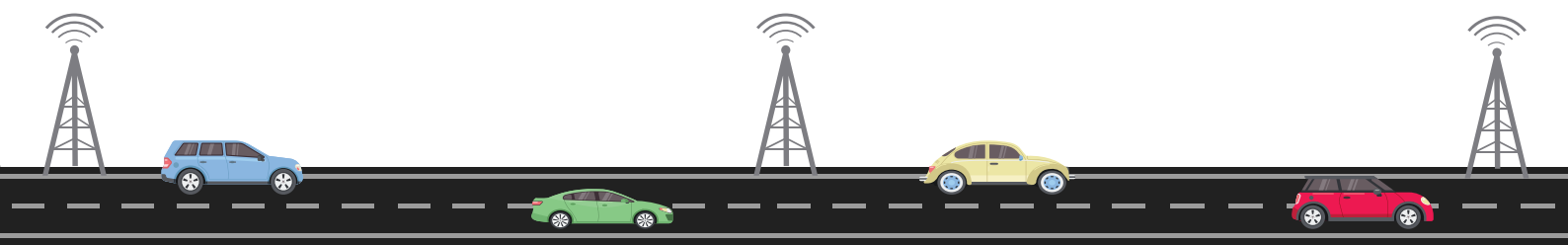
The need for more intelligent control solutions for vehicular ad hoc networks arises due to heavy traffic at urban intersections and also to achieve very high speed communication. Vehicle-to-X refers to an intelligent transport system where all vehicles and infrastructure systems are interconnected with each other. Only if the vehicles are connected to each other, information regarding the traffic scenarios can be shared among them and in turn will be spread to the entire road network that will help to take immediate action for the following situations

- Optimize traffic flows
- Reduce congestion
- Reduce accident numbers
- Minimize emission that causes pollution

Vehicle2X/Car2X technology which is already under development enables vehicles to send messages automatically from one vehicle to another regarding the conditions of the roads, traffic flow, and presence of any obstacles, before these messages could appear in the driver's visual range. Vehicles receive signals from intelligent road signs (provided in signals or road side units).
Recently communication between Rail2X, Ship2X and Airplane2X are also considered and will use the same technology as Car2X. The basic definition for the application of this technology is currently in progress.

IV. Working of V2X Communication

V2V and V2I are comprised of smart vehicles and roadside units (RSU) which communicate through unreliable wireless media.
There are special characteristics of VANETs, such as high mobility, dynamic network topology due to high mobility of vehicles, and predictable node movements. These characteristics have to be addressed with certain algorithms and protocols. Hence we need to develop or design new routing algorithms and protocols which are specific to new environment. Since the information's are exchanged between vehicles in a wireless media as mentioned above i.e. in ad hoc mode (anytime and anywhere access), Security poses a great challenge, since it may affect life-or-death decisions.



To date, studies have focused on VANET technologies with limited attention on security aspects. Hence security has to be given more importance as it plays a major role for maintaining privacy of data transmission between vehicles leading to accident avoidance.

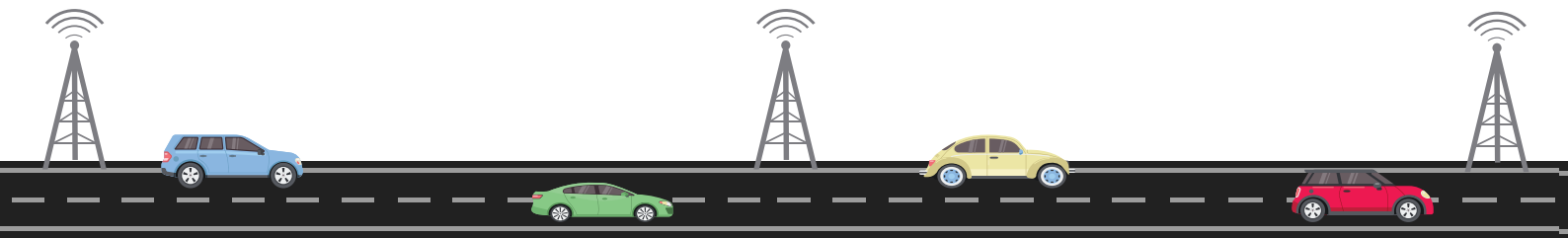
V. Evolution from VANETS to Internet of Vehicles (IoV)

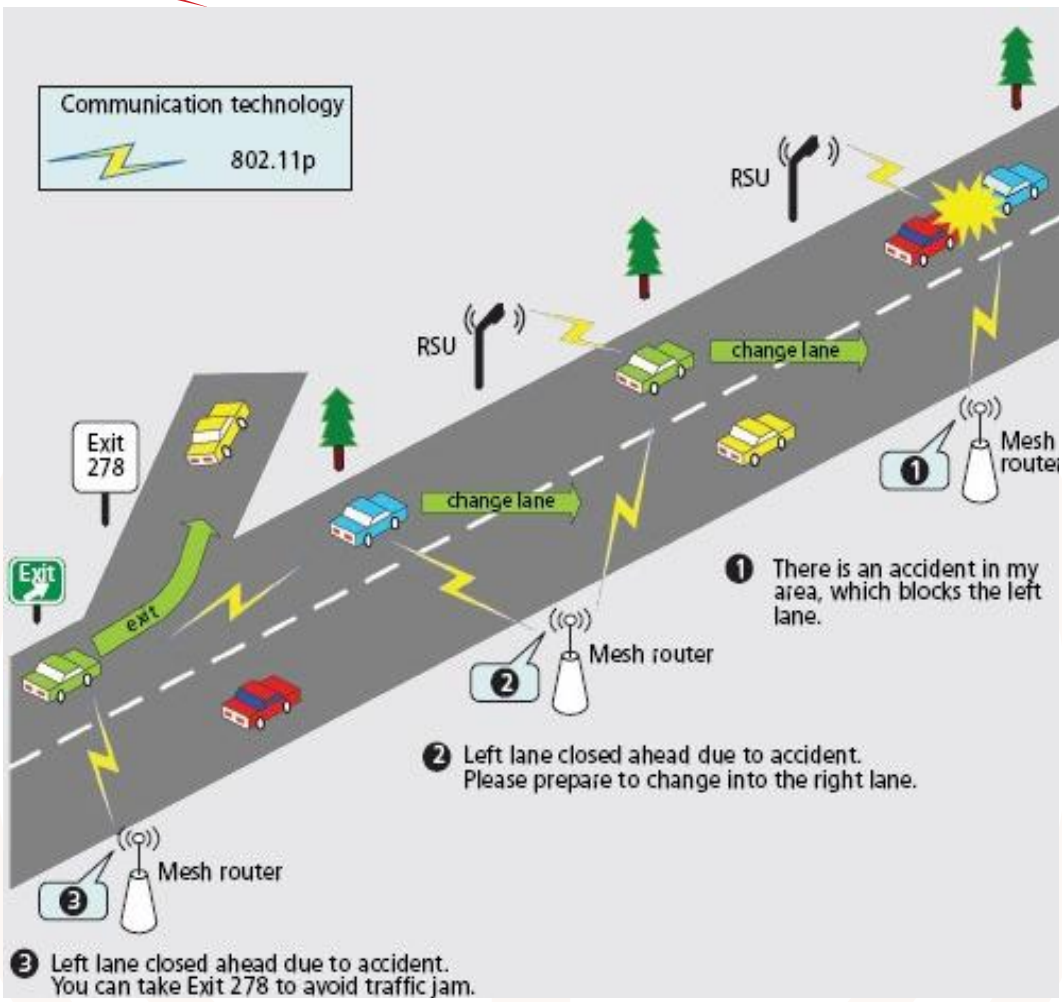
The Internet of Things (IoT) has been an emerging paradigm. IoT consists of different types of devices and technologies in order to provide a connection among things at any time, from any place, to any network. IoT has attractive areas of use such as smart home systems, assisted living, smart energy, e-health, and intelligent transportation systems. There has been a large increase in the number of things connected to the Internet. Beside safety-related applications, there are also other applications such as infotainment, payment services, insurance calculations based on usage, and other similar means. These are applications which require vehicles to communicate with infrastructure, people and the Internet, resulting in VANETs having evolved into the universal paradigm known as the Internet of Vehicles (IoV)

Internet of Things will grow to 26 billion devices/units by 2020. It is expected that a considerable number of these devices will be the On Board units (OBU's) in vehicles, which form the Internet of Vehicles (IoV) or the Internet of Cars. IoV has evolved from VANETs and is expected to eventually evolve to become the Internet of Autonomous Vehicles. There are many open research areas on the Internet of Things, from identification and communication technologies to standardization.
Also Artificial Intelligence will be used in near future for training the vehicular networks for efficient communication of information that will lead to smooth and continuous routing.

Conclusion

Current technology is heading towards Internet of Vehicles (IoV) from VANETS and IoT devices are mostly used in Vehicles for communication between V2X. So to conclude, as many of the on board devices which constitute IoT are not designed with security aspects, security attacks and solutions are also some of the main research challenges to be addressed both in devices as well as in routing for secure communication purposes.





VANET Communication Scheme

References:

1. https://en.wikipedia.org/wiki/Vehicle-to-everything

2. An assessment of LTE - V2X (PC5) and 802.11p direct communications technologies for improved road safety in the EU (http://5gaa.org/wp-content/uploads/2017/12/5GAA-Road-safety-FINAL2017-12-05.pdf)

3. White Paper on ITS spectrum utilization in the Asia Pacific Region (http://5gaa.org/wp-content/uploads/2018/07/5GAA_WhitePaper_ITS-spectrum-utilization-in-the-Asia-Pacific-Region_FINAL_160718docx.pdf)

4. http://www.middleeast.siemens.com/pool/news_press/siemens-vehicle-to-x-communication-technology-infographic.pdf

INVENTE 3.0 : A Report

SSNCE hosted Invente 3.0, a two-day national level tech fest, on 21st and 22nd September 2018. The event was aimed at encouraging budding engineers to discover hidden interests and enticing technophiles to showcase their talents with unbridled enthusiasm. The two-day fest witnessed participation from engineering students from across the country. The event featured several workshops and technical and non-technical sessions offering the participating students exposure to all engineering streams under one roof.

The Department of ECE conducted a total of ten events - eight technical and two non-technical. In addition to this, a 24 hour hackathon was also conducted by the Tech Club of Department of ECE. No stone was left unturned to integrate creativity, originality, erudition and innovation in all the events.

The technical events included:

01 **SOLDER IT**
In this event the participants were required to build and solder a circuit for the problem statement given.

02 **BID IT TO WIN IT**
This event was an opportunity for participants to showcase their circuit building skills by solving puzzles and riddles to bid for components which they will use to build a circuit in the end.

03 **IN-A-WAY-TE**
This event challenged the participants' grey matter to come up innovative solutions to real-life problems.

04 **HEXATHALON**
This event aimed to test one's fundamentals in six domains namely, C/C++, MATLAB, Arduino, Circuit theory, Electronic circuits and Control systems.

05 **MAKE-A-THON**
This event was conducted to test the coding skills of participants. The students used MATLAB, C++ or Python platforms to solve the problem statement.

06 JUNKYARD JUMBLE

This event, organised by the IEEE Communication Society, was a true test of an electronics engineer. The students were required to test and build circuits from foraged components.

07 E- TREASURE HUNT

This event was similar to the traditional treasure hunt but with an electronic twist. The students were led on a trail to find electronic components hidden at different locations in the campus using the clues given. In the end, the students had to design a circuit using the components found to win the final treasure.

08 PAPER PRESENTATION

This was the star event. Teams presented their papers on one of the following domains: Wireless sensor networks, VLSI, Robotics, Communication, Crypto- Security and Privacy, IOT, Opto electronic devices, Antenna, Speech and Image Processing and Embedded Systems.

The two non technical events included:

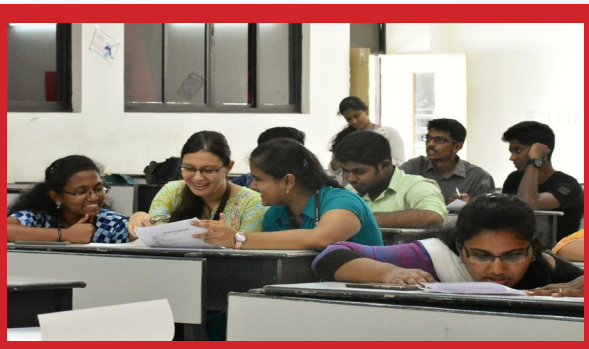
01 DRUNK IN QUIZ

This event not only challenged your grey cells but also your palate.

02 TRIWIZARD TOURNAMENT

This event was an opportunity for the students to display their problem solving ability and management skills.

In all, the events saw a tremendous participation of 540 students across the two days. Cash prizes worth Rs. 64,000/- were distributed to the winners.



Visits and Interactions

1. Dr. B. S. Sreeja, Asso. Prof. visited EPFL Switzerland between 2nd and 12th Jun. 2018 and participated in a technical discussion of the sanctioned international CODEV project "ĬnDeGEMS". She also delivered an invited talk on the topic "Towards low cost fabrication of Micro and Nano devices".

2. Dr. S. Sakthivel Murugan, Asso. Prof., Dr. N. Padmapriya, Asst. Prof./Maths and Ms. Dhanalakshmi, JRF visited NIOT and interacted with Dr. G. A. Ramadoass, Project Director and Mr. Ramesh, Scientist ROSUB and deep sea technology department on 22nd un. 2018. They also visited the ROSUB lab and discussed on ROV, Underwater Cameras, AUV, Manned submersibles, multibeam echo sounder etc.

3. Dr. S. Esther Florence, Asso. Prof. and Dr. S. Radha, Prof. & Head, interacted with Mr. Vinay Kumar, Business Development Engineer, Silicon microsystems, Bangalore, regarding the use of FEKO software and purchase of Software Defined Radio kit on 13th Jul. 2018.

4. Dr. S. Esther Florence, Asso. Prof. and Dr. S. Radha, Prof. & Head, interacted with Mr. P. Anand, Business Development Engineer-Education, Chennai, regarding the conduct of a one week workshop on "Solid works PCB Design" in the Department on 17th Jul. 2018.

5. Dr. S. Sakthivel Murugan, Asso. Prof., along with his research team members collected data at Mahabalipuram using NIOT Scientific Research Vessel Sagar Manjusha from 28th Jul. – 1st Sep. 2018.

6. Dr. S. Sakthivel Murugan, Asso. Prof. and his team along with UG students visited CPCL and IOC plants in Manali for Oil Leakage detection system on 6th Sep. 2018.

7. Dr. S. Sakthivel Murugan, Asso. Prof. and his team members interacted with Dr. Nakeeran, Prof./DOE, Pondicherry University, Dr. S. Palanisamy, Prof., NIT Trichy, Dr.Selvaraj, Asso. Prof., IIITDM and visited the Underwater Acoustic Research lab on 7th Sep. 2018.

8. Dr. S. Radha, Prof. & Head, Dr. N. Venkateswaran, Prof., & Dr. R. Hemalatha, Asso. Prof. visited CSIR – CEERI, Chennai on 8th Sep. 2018 and attended meeting with Dr. Santhanu Chowdry, Director, CSIR-CEERI.

9. Dr. S. Sakthivel Murugan, Asso. Prof. and his project student members had discussion on the topics, Oil pipeline leakage system and smart light system using IoT, with Mr.Vijay Anand Vice President, Aricent Technologies, Chennai on 8th Sep. 2018.

10. Dr. S. Sakthivel Murugan, Asso. Prof. attended a meeting by EyeROV - the first commercial ROV handing over to NPOL at Cochin on 14th Sep. 2018. He interacted with directors of NPOL & EyeROV on development of indigenous ROV and its applications.

11. Dr. Usha Jagannathan, Graduate program chair- information technology program, Dr.Patrick Phelan, Assistant Dean of Graduate programs, Professor, Mechanical & Aerospace Engineering Senior Sustainability Scientist from Arizona state University with his team members visited UWARL and interacted with Dr. S. Sakthivel Murugan Asso. Prof. and his team members on 21st Sep. 2018.

12. Dr. S. Radha, Prof. & Head, Dr. N. Venkateswaran, Prof., & Dr. R. Kishore, Asso. Prof., visited Coovum Smart Systems Pvt Ltd for Industrial Collaboration and MOU discussion on 22nd Sep. 2018.

13. Dr. S. Radha, Prof. & Head & Dr. B.S. Sreeja, Asso. Prof., visited Karunya University and had discussion with Dr. P. Jagadambal, Prof., Water Research Institute for Joint project proposal submission to DST and transferring technology to Industry on 25th Sep. 2018.

14. Dr. S. Radha, Prof. & Head, Dr. S. Ramprabhu, Asso. Prof. had a discussion with Mr. Ravi Boonapalli, Mentor Graphics, Bangalore regarding the course formulation to enhance the employability of the students in industries on 26th Sep. 2018.

15. Dr. S. Sakthivel Murugan Asso. Prof. participated in Industry Academia Interaction and Student Engineering Project Exhibition in the fourth international India International Science Festival held in Lucknow from 5th to 8th Oct. 2018.

9. Dr. S. Sakthivel Murugan, Asso. Prof. and his project student members had discussion on the topics, Oil pipeline leakage system and smart light system using IoT, with Mr.Vijay Anand Vice President, Aricent Technologies, Chennai on 8th Sep. 2018.

16. Dr. N. Edna Elizabeth, Prof. visited CSIR-CLRI and had discussions with Dr. K. Phebe Aaron, Principal Scientist, CSIR-CLRI regarding Project proposal to be submitted to CSIR for the second phase review on 26th Oct. 2018.

17. Dr. S. Radha, Prof. & Head and Dr. R. Hemalatha, Asso. Prof., visited NRCB Trichy and had discussions with the principal scientists Dr.R.Selvarajan and Dr.B.Padmanaban about the proposal submitted to DST-State Science & Technology programme on 29th Oct. 2018.

18. Dr. K.T. Selvan, Prof. along with Mr. V. Lingasamy, RS and Ms. M. Akila, RS visited ISRO-Satellite Application Center, Ahmedabad for the project review and project related discussions on 30th & 31st Oct. 2018.

GALLERY

Dr. Sakthivel Murugan & his team at NIOT Scientific Research Vessel Sagae Manjusha.

Dr. Sakthivel Murugan and his team at CPCL and IOC Plant.

Dr. Sakthivel Murugan along with Mr. Arun Kumar (ME-CS) at Fourth International India, International Science Festival held at Lucknow.

DR. Sakthivel Murugan during the meeting organized by EyeROV at NIOT.

Expert Lectures

Talks at the Department

01 Dr. Arun Janarthanan, Qualcomm, "SoC HW/SW Design and Power Architecture" on Friday, Jun. 29, 2018.

02 Mr. Amith Ravindran, Co-Founders, Byju's the learning app, "Technical Profile building & Patented Techniques to crack Aptitude / competitive examinations", 11th Jul. 2018.

03 Professor Buon Kiong Lau, Lund University, Sweden, "For better, for worse - A story of two dipole antennas" 2nd Nov. 2018.

04 Mr. Hari, General Manager, CAISER, "IOT and Energy Management", September 26, 2018.

05 Prof. Jayaraman, a technical expert who has vast experience in industries and a success assurance partner for National Instruments (NI India), Academic Relations delivered a lecture on," Enhancing Employability in core Engineering Industries NI Platform for-Do Engineering & NI Certification" on 18th Jul. 2018.

Faculty Expert Lectures

01 Dr. N. Venkateswaran, Prof., "Medical Image Segmentation" in the FDP on Advances in Medical Signal and Image Processing conducted by BME Department, SSN College of Engineering organized during 7th -11th May 2018.

02 On 29th Jun. 2018, Dr. S. Sakthivel Murugan, Asso. Prof., "Underwater Sensors" in the AICTE-ISTE Sponsored induction/refresher programme on "Embedded Systems and its application in IoT" held at Sri Krishna College of Engineering and Technology during Jun. 25th - 30th, 2018.

03 Ms. P. Kaythry, Asst. Prof., "Foldscope" on 31st Jul. 2018 at INSPIRE Programme, at SSN College of Engineering. She also delivered a lecture and conducted hands on session on "Foldscope" for Techbee students at SSN College of Engineering on 31st Aug. 2018.

04 Dr. S. Ramprabhu, Asso. Prof., "Novel Antennas for Automotive and Wireless Communication Systems," at Kongu Engineering College on 11th Aug. 2018.

05 On 17th Aug. 2018, Dr. M. Gulam Nabi Alsath, Asso. Prof., "Automotive Antennas" during the IEEE APS sponsored Seminar and Poster Presentation on Antennas hosted by Kumaraguru College of Technology, Coimbatore.

06 Mr. C. Vinothkumar, Asst. Prof., "Finite word length effects in Filters" at Dhanalakshmi College of Engineering and Technology; Chennai on 24th Aug. 2018.

07 Dr. S. Ramprabhu, Asso. Prof. "Frequency Selective Surfaces – Theory and Application in Electromagnetic Shielding," at Coimbatore Institute of Technology on 31st Aug. 2018.

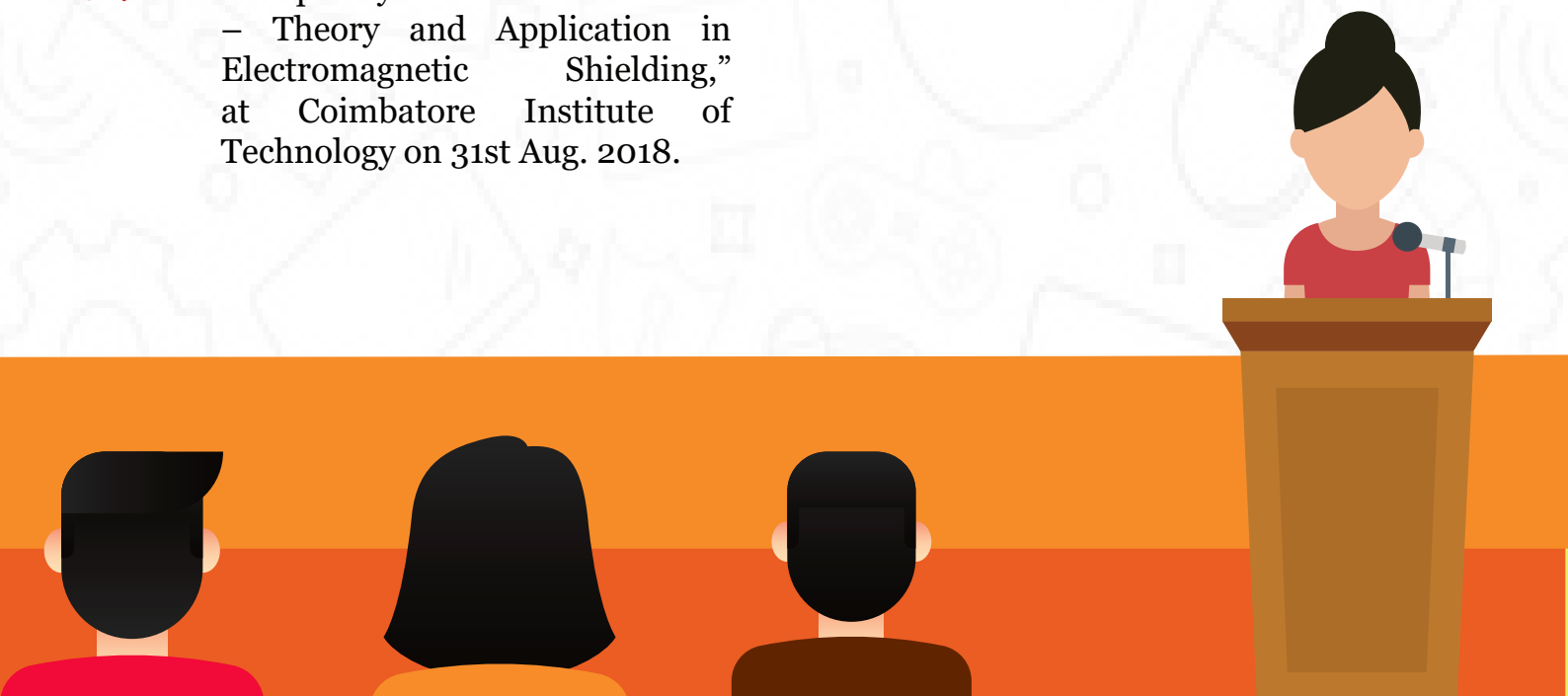
08 Dr. S. Ramprabhu, Asso. Prof., "Importance of EMIC in Electronic System Design" at Valliammai Engineering College, Chennai on 7th Sep. 2018.

09 Mr. C. Vinothkumar, Asst. Prof., "Spatial and Frequency domain Enhancement Techniques" at Dhanalakshmi Srinivasan College of Engineering and Technology.

10 Dr. S. Sakthivel Murugan, Asso. Prof., "Underwater Sensors and Robotics" at St. Joseph Institute of technology, OMR, Chennai on 11th Sep. 2018.

11 Dr. K. T. Selvan, Prof., "A story of Maxwell's displacement current" at an IEEE AP/MTT-S Joint Chapter meeting held at SAC, Ahmadabad on 31st Oct. 2018.

12 Dr. M. Gulam Nabi Alsath, Asso. Prof., "Microstrip Antenna Arrays: Design and Simulation" for the 1st year Communication Systems Students on 29th Nov. 2018.



Events Organized

01 **Anna University approved 7 day FDTP on "Digital Communication"**
Date: 11th – 17th Jun. 2018
Coordinators: Dr. S. Radha, Prof. & Head and Dr. R. Amutha, Prof.
Speakers: Dr. P. Vijayalakshmi, Prof., Dr. N. Venkateswaran, Prof., Dr. K. Muthumeenakshi, Asso. Prof., Dr. R. Hemalatha, Asso. Prof. Ms. S. Hanis, Asst. Prof., Ms. P. Kaythry, Asst. Prof.
Participants: 25 participants from various Engineering Colleges

02 **Three-day workshop on "Hands on training in Internet of things and Embedded systems"**
Date: 9th – 11th Aug. 2018
Sponsors: SSN Trust and IETE Chennai Chapter
Coordinators: Dr. S. Radha, Prof. & Head and Dr. N. Venkateswaran, Prof.
Speakers: Dr. Swarna Ravindra Babu, CEO, Coovum Smart Systems and his team
Participants: PG students and Research Scholars of the Department

03 **One day workshop on "Foldscope"**
Date: 11th Aug. 2018
Sponsors: DST-DBT
Coordinators: Ms. P. Kaythry, Asso. Prof.
Speakers: Dr. B.Prakash, Head, Dept. of Bio-Technology, Vivekananda College of Arts & Science, Tiruchengode.
Participants: 50 students from various departments participated in the workshop

04 **Three day Workshop on Conventional Machine learning to Deep learning for Speech, Image and Text processing**
Date: 16th – 18th Aug. 2018
Sponsors: IEEE Signal Processing Society
Coordinators: Dr. P. Vijayalakshmi, Prof. & Dr. M. Anbuselvi, Asso. Prof.
Speakers:.
Dr. C. Chandrasekar, Professor, Dept of CSE, IIT Madras, Chennai; Dr. Madhavan Mukund, Professor and Dean of Studies, Chennai Mathematical Institute, Chennai; Dr. L. Sobha, Member Research Staff, Computational Linguistics Research Group, Information Sciences Division, AU-KBC Research Center, Chennai; Dr. M. Anand Kumar, Assistant Professor, Dept. of IT, NIT Suratkal; Mr. Karthikeyan Padmanaban, Architect, Tata Elxsi, Chennai; Dr. V. Masilamani, Assistant Professor, Dept. of CSE, IIITDM, Kanchipuram; Dr. T. Nagarajan, Professor and Head, Dept. of IT, SSN College of Engineering, Kalavakkam; Dr. P. Vijayalakshmi, Professor, Dept. of ECE, SSN College of Engineering, Kalavakkam; Dr. B. Bharathi, Associate Professor, Dept. of CSE, SSN College of Engineering, Kalavakkam; Dr. P. Mirunalini, Associate Professor, Dept. of CSE, SSN College of Engineering, Kalavakkam.
Participants: 100 participants (faculty members, research scholars and final year B.E students)

05 **Four day workshop on "LaTeX"**
Date: 27th – 30th Aug. 2018
Coordinators: Dr. A. Jawahar Prof. and Dr. R. Amutha Prof.
Speakers: Dr. R.S. Milton, Dr.R.Kanchana, Dr.J. Suresh, Dr..K.Vallidevi and Dr. S. Sheerazudhin
Participants: I Sem ME AE, CS and VLSI

06 **24 hour Hackathon**
Date: 7th & 8th Sep. 2018.
Coordinators: Dr. S. Ramprabhu, Asso. Prof. & Dr. M. Gulam Nabi Alsath, Asso. Prof.
Participants: UG Students from various departments

07 **Two day workshop on "Simulation Tools"**
Date: 25th & 26th Sep. 2018.
Coordinators: Dr. S. Radha, Prof. & Head, Dr. R. Rajavel, Asso. Prof. & Dr. S. Joseph Gladwin, Asso. Prof.
Speakers: Dr. Premanand Chandramani, Prof., Dr. R. Rajavel, Asso. Prof., Dr. R. Kishore, Asso. Prof., Dr. S. Joseph Gladwin, Asso. Prof., Dr. M. Gulam Nabi Alsath, Asso. Prof., Dr. K. J. Jegadish Kumar, Asso. Prof., Dr. B. Bharathi, Asso. Prof./CSE, Dr. Aasha Nandhini, PDF
Participants: I ME AE, CS and VLSI students

08 **Two day workshop and Hands-on Training on CADENCE Tools**
Date: 12th & 13th Oct. 2018
Coordinators: Dr. V. Vaithianathan Asso. Prof. and Mr. C.Thiruvenkatesan Asso. Prof.
Speaker: Dr. V. Vaithianathan Asso. Prof.
Participants: I year ME-AE and VLSI students.

09 **Two day IEEE AP-S seminar entitled "Exciting Applications of Electromagnetics"**
Date: 27th & 28th Oct. 2018
Coordinators: Dr. K. T. Selvan, Prof., Dr. S. Joseph Gladwin Asso. Prof., Dr. K. K. Nagarajan, Asso. Prof. and Mr. S. Karthie, Asst. Prof.
Speakers: Prof. David Koilpillai, IIT Madras; Prof. Avinash Deshpande, RRI Bengaluru; Prof. S.P. Singh, IIT (BHU), Varanasi; Prof. D. Singh, IIT Roorke; Dr. Uday Khankoje, IIT Madras
Participants: 35 participants including research scholars from various engineering colleges

Events Attended

01 Dr. R. Amutha, Prof. has attended the workshop on "How to incorporate Design Thinking methodology into new curriculum and teaching plans at SSN College of Engineering on 26th Jul. 2018.

02 Dr. S. Radha, Prof & Head., Dr. N. Venkateswaran, Prof., Dr. K. Muthumeenakshi, Asso. Prof., attended a short term course on "Millimeter Wave Communication and Filter Bank Multicarrier Technologies for 5G systems" at M.S. Ramaiah Institute of Technology, Bengaluru, organized by IIT Kanpur from 25th to 28th Jul. 2018.

03 Dr. Sakthivel Murugan Asso. Prof. attended the MTS tech surge 2018 meeting held by Marine technology Society and NIOT at Chennai on 10th Aug. 2018.

04 Dr. N. Edna Elizabeth, Prof. attended a two day National workshop on "Vehicular Ad Hoc Networks and its Security" conducted by Department of Software Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai from 27th Sep. To 28th Sep. 2018.

05 Dr. R. Rajavel, Asso. Prof. attended a two day workshop on "Speech Processing for Voice, Speech and Hearing Disorders" held at All India Institute of Speech and Hearing (AIISH), Mysore on 8th & 9th Sep. 2018.

06 Dr. R. Jayaparvathy, Prof. attended the TEQIP III Sponsored one week Faculty Development Programme on Artificial Intelligence, Machine Learning and Deep Learning: Research and Applications Perspectives at PSG College of Technology, Coimbatore from 22nd to 28th Oct. 2018.

07 Dr. P. Kaythry, Asso. Prof. attended one day workshop on "Emerging Sensor Technologies and Data Analytics for Air Quality Monitoring" at IIT Delhi on 1st Nov. 2018.

08 Dr. S. Sakthivel Murugan, Asso. Prof. attended and presented papers titled "Studies on water column nutrient distribution and sound profile variations along coastal region of India" & "Segmentation of underwater acoustic images by FCM with EMD in the 176th Meeting of the Acoustical Society of America Victoria, Canada from 5th Nov. - 9th Nov. 2018.

09 Dr. R. Rajavel, Asso. Prof. attended a Faculty Development Programme on Machine Learning in Speech Processing, National Institute of Technology, Warangal, Telungana, India from 12th Nov. - 17th Nov. 2018.

10 Dr.R.Hemalatha, Asso. Prof. attended the Faculty Development Programme on "Data Analytics - A Boot camp with Hands-on using Python" held at Department of Information Technology, SSN College of Engineering from 26th Nov - 30th Nov 18.

11 Dr. S. Joseph Gladwin, Asso Prof attended IEEE All India Student - Young Professionals - Women in Engineering Congress (AISYWC'18) at Mysuru during 28-30 September 2018 as a sponsored representative from IEEE Madras Section.

PROFESSIONAL ROLES AND RECOGNITIONS

1. Dr. P. Vijayalakshmi, Prof. reviewed papers for IEEE Transactions on Audio, Speech and Language Processing, Journal of Experimental and Theoretical Artificial Intelligence and Computer, Speech and Language (Elsevier) Journal.

2. Dr. K. K. Nagarajan, Asso. Prof. reviewed a manuscript for International Journal of Electronics, Taylor and Francis.

3. Dr. V. Vaithianathan, Asso. Prof. reviewed a manuscript for Journal of Circuits, Systems, and Computers.

4. Dr. K. T. Selvan, Prof. reviewed papers for International Journal of RF and Microwave Computer-Aided Engineering, IETE Journal of Research, IEEE Transactions on Antennas and Propagation, Sadhana Journal, 2018 IEEE Indian Conference on Antennas and Propagation, IET Microwaves Antennas and Propagation.

5. Dr. S. Radha, Prof. & Head, reviewed the Internally funded faculty projects of ECE along with Dr. R. Amutha, Prof., Dean Research & expert member on 10th Jul. 2018.

6. Dr. M. Gulam Nabi Alsath, Asso. Prof. conducted the DC meeting of his full time research scholar Ms. Devi Sowjanya on 11th Jul. 2018.

7. Dr. R. Amutha, Prof. attended the DC meeting at Sathyabama University on 11th Jul. 2018.

8. Dr. N. Venkateswaran, Prof. conducted the Ph.D oral defense examination of his research Scholar Ms. K. Madheswari on 12th Jul. 2018.

9. Dr. M. Gulam Nabi Alsath, Asso. Prof. as DC member attended the DC meeting of the research scholars at SRM University, CEG and SA Engineering College.

10. Dr. S. Esther Florence, Asso. Prof. attended the first DC meeting of Mr. Ananda Venkatesan, Research Scholar of Dr. Kalimuthu, SRM University on 26th Jul. 2018.

11. Dr. R. Amutha has attended the six month research review meeting at Sathyabama University on 27th Jul. 2018.

12. Dr. N. Venkateswaran, Prof. participated as Doctoral Committee member for two research scholars at SRM University on 28th Jul. 2018.

13. Dr. S. Radha, Prof & Head attended two DC meetings at SRM University during Jul. And Aug. 2018.

14. Dr. M. Gulam Nabi Alsath Asso. Prof. was invited as a panel member for project staff selection for the ISRO funded project on Reflect array Antennas at Sri Venkateswara College of Engineering, Sriperumbuthur on 14th Aug. 2018.

15. Dr. A Jawahar, Prof., was invited from B.S Abdur Rahman Crescent Institute of Science and Technology for Annual Academic Audit Committee to audit their question papers and answer scripts on 23rd Jul. 2018.

16. Dr. B. S. Sreeja., Asso. Prof. attended a DC meeting at SRM university on 24th Jul. 2018.

17. Dr. S. Radha, Prof & Head. conducted DC meeting for her research scholars on 24th Jul. 2018.

18. Dr.C.Annadurai Asso. Prof. has reviewed a paper for Elsevier's Computer and Electrical Engineering Journal & Cluster Computing Journal.

19. Mr. C. Vinothkumar, Asst. Prof, reviewed a paper for IEEE Access Journal.

20. Mrs. G. Durga has reviewed a paper for IETE Journal of Research

21. Dr.R.Amutha has reviewed a paper for the International journal on HKIE Transactions.

22. As a sequel to the IEEE-INAE Symposium on Electromagnetic Education and Research held during December 12-13, 2016 at SSN, the 2018 IEEE-INAE Workshop on Electromagnetics is to be held during December 6-8 in Trivandrum. The website for this programme was launched late June. Dr. K. T. Selvan, Prof. is the Co-General Chair for this Workshop, Dr.Esther Florence, Asso. Prof. and Dr. Gulam Nabi Alsath Asso. Prof. are on the Technical Programme Committee.

23. Ph.D Viva-Voce was conducted for J. Florence Gnana Poovathy under the guidance of Dr. S. Radha Prof. & Head on 3rd Aug. 2018.

24. Dr. S. Ramprabhu Asso. Prof. reviewed a paper for IET Electronic Letters

25. Dr. S. Radha, Prof. & Head, attended DC meeting at Sathyabama University on 4th Aug. 2018.

26. Dr. M. Anbuselvi, Asso. Prof. reviewed a research paper for National Academy Science Letters, Springer and International Journal of Electronics, Taylor & Francis.

27. Dr. R. Hemalatha, Asso. Prof., reviewed a paper for Elsevier Computers and Electronics in Agriculture.

28. Dr. C. Annadurai, Asso. Prof. was invited as a Chief Guest for the 12th National Level Technical Symposium Sparcadeus-2k18 at Department of Electronics and Communication Engineering, hosted by Dhanalakshmi Srinivasan College of Engineering and Technology, Chennai on 10th Aug. 2018.

29. Confirmation meeting was conducted for Mr. Mohammed part time RS under the guidance of Dr. R. Amutha Prof. on 24th Aug. 2018.

30. Dr. N. Venkateswaran, Prof., reviewed a paper for IEEE Access magazine.

31. Dr. A. Jawahar Prof., being an academic council member of VEL's Institute of Science, Technology and Advanced Studies, attended XV Meeting of Academic Council held on 23rd Aug. 2018.

32. Dr. S. Radha, Prof. & Head conducted Ph.D Viva Voce examination for her Full Time research scholar Ms. V. Angayarkanni on 7th Sep. 2018.

33. Dr. R. Jayaparvathy Prof. was nominated and attended the NBA Evaluator Orientation Workshop on Outcome based Accreditation hosted by the National Board of Accreditation at India Habitat Center, Lodhi Road, New Delhi on 24th Oct. 2018.

34. Dr. R. Jayaparvathy, Prof. was invited for the Doctoral Committee Meeting at PSG College of Technology on 29th Oct. 2018.

35. Dr. R. Jayaparvathy Prof. reviewed technical papers submitted to Scientific Journal.

36. Dr. S. Radha, Prof. as an external examiner conducted M.E. Project viva voce at PEC, Pondichery & MIT,Anna University on 2nd Nov. 2018 & 28th Nov. 2018.

37. Dr. S. Radha, Prof. as an expert member attended 4th expert screening committee on State S&T Programme at Bangalore on 15th and 16th Nov. 2018

38. Dr. S. Joseph Gladwin is appointed as a member of Advisory Board in IEEE-INAE Workshop on Electromagnetics (IIWE) conducted by IEEE AP-S at Trivandrum during 6-8, December 2018.

39. Dr. M. Gulam Nabi Alsath, Asso. Prof. conducted PhD viva-voce meeting for his part-time research scholar Mr. A. Henridass on 16th Nov. 2018.

40. Dr. P. Vijayalakshmi, Prof. attended Board of studies meeting for B.E ECE and M.E Applied Electronics as an Academic council nominee on 24th Nov. 2018 at Kumaraguru College of Technology, Coimbatore.

41. Dr. S. Radha, Prof. attended synopsis meeting at Sathyabama University.

42. Dr. M. Gulam Nabi Alsath, Asso. Prof. conducted JRF selection interview for his DST funded funded project. Dr. S. Ramprabhu and Dr. S. Kirubaveni participated in the same. Dr. S. Radha, Prof. & Head and Dr. K. Malathi, Prof./ CEG were the panel members during the interview.

43. Dr. M. Gulam Nabi Alsath, Asso. Prof. reviewed papers submitted to IEEE Antennas and Propagation Magazine and IEEE Antennas and Wireless Propagation Letters.

RESEARCH NEWS

EXTERNAL FUNDED PROJECTS

1. Dr. R. Rajavel, Asso. Prof. (PI), Dr. B. Bharathi, Asso. Prof./CSE (Co-PI), Shri. Nachiketa Rout (Co-PI), ASP, Speech, Hearing & Communication Department, National Institute for Empowerment of Persons With Multiple Disabilities (NIEPMD), East Coast Road (ECR), Muttukadu, Kovalam Post, Chennai has submitted an external funded project titled "Design and development of a software digital hearing aid to DST-Cognitive Science Research Initiative (CSRI) for Rs. 10.93 Lakhs.

2. Dr. M. Gulam Nabi Alsath Asso. Prof. (PI), Dr. S. Ramprabhu Asso. Prof. (Co-PI) and Dr. S. Kirubaveni (Co-PI) Asso. Prof. received the sanction order from DST SERB for their approved project titled "Theoretical and Experimental Analysis on the Design of Reflect array Antennas with an Integrated Electronic Control System" for Rs. 36,73,602/-.

3. Dr. S. Radha, Prof. & Head., Dr. Gulam Nabi Alsath, Asso. Prof., Dr. S. Ramprabhu, Asso. Prof. submitted the Progress report on Establishment of Microwave and Antenna Testing Lab facility to AICTE.

4. Dr. K. T. Selvan, Prof. attended RESPOND projects review Meeting at Satellite Applications Centre, Ahmadabad and presented the progress of reflect array project along with V. Lingasamy, Research Scholar on 30th and 31st Oct. 2018.

5. Dr. S. Radha, Prof. (PI) and Head and Dr. R. Hemalatha, Asso. Prof. (Co-PI) presented their project titled "Development of an Efficient IOT Enabled Plant Disease & Pest Detection System" worth Rs 82.84 Lakhs on 15-11-2018 during the 4th expert screening committee under DST SSTP scheme at Bangalore.

6. Dr. B. S. Sreeja, Asso. Prof. (PI) and Dr. S. Radha, Prof. (PI) presented their project titled "Development of Cost Effective Wearable Semi-Automatic Insulin Delivery Smart Micro System", worth Rs. 82.48 Lakhs. to DST - BDTD panel on November 20th, 2018 at IIT-Delhi.

7. Dr. N. Venkateswaran, Prof. and Dr. W. Jino Hans, Asso. Prof., presented a project proposal titled "E-Bin" worth Rs.18 Lakhs to DST under "Waste Management Technologies (WMT) Program", at PSG College of Engineering and Technology, Coimbatore.

8. Dr. Edna Elizabeth. N, Prof. (PI) and Dr. R. Kishore. R Asso. Prof. (Co-PI) submitted a project proposal titled

"Design and development of leather watch strap based heart beat monitoring device to CSIR-CLRI, on 2nd Nov. 2018 for the second phase review of worth Rs.40 Lakhs.

9. Dr. R. Kishore, Asso. Prof. (PI), Dr. N. Edna Elizabeth, Prof (Co-PI) and Dr. S. Radha, Prof. & Head (Co-PI), submitted a project proposal titled "Exploring the possibilities of side channel power analysis attacks and radio attacks on implantable and wearable medical devices to develop suitable cryptosystems" to MeitY under Cyber Security R&D division on 17-11-2018 for worth Rs 29.7 Lakhs

INTELLECTUAL PROPERTY RIGHTS

1. Dr. M. Gulam Nabi Alsath, Asso. Prof., Dr. S. Kirubaveni, Asso. Prof., Mr. Nishanth Vimalesh (IV ECE), Mr. Sudharsana Prasad (IV ECE) submitted the draft patent application titled "Interactive Road Safety System: A method and device thereof" to Mr. Amit Tyagi for filing at IPR, Guindy on 26th Jul. 2018.

2. Dr. Esther Florence S, Asso. Prof., Ms Harini, III year student B.E.., Mr Vignesh IV year student B.E./IT submitted a Patent Application titled "Flexible Wearable Sensor for wireless Screening of Obstructive Sleep Apnoea" to the SSN Patent Committee meeting on 10th Sep. 2018.

3. Dr. P. Vijayalakshmi, Prof., N.Naren Raju (IV EEE) and V. Aishwarya (M.E CS 2016-2018) have filed a patent titled "Hidden Markov model-based sign language-to-speech conversion system in Tamil" in the Indian Patent office (Application No.: 201841038594)

4. Ms. R. Indhu, RS, Dr. S. Radha Prof. & Head, Dr. Sreeja B.S., Asso. Prof., S. Manikandan. E RS, published the patent "An Apparatus and Method of Detecting Cholesterol Contents in Human Serum using Laser Induced Breakdown Spectroscopy(LIBS)" in the Indian Patent office (Application No.: 201841030310)

JOURNAL ARTICLES

1. Ms. K. Ashwini, RS & Dr. R. Amutha, Prof., "Fast and secured cloud assisted recovery scheme for compressively sensed signals using new chaotic system," Springer's Multimedia Tools and Applications, pp. 1-26, June 2018 (Published online).

2. Dr. K. T. Selvan, Prof., Dr. S. K. Sharma, Prof/SDSU/California, G. Mishra, SDSU/California and R.R. George, SDSU/California, "A simpler reference antenna gain measurement method," Microwave and Optical Technology Letters, vol. 60, no. 8, pp. 1937-1940, Aug. 2018.

3. Ms. K. Saffrine, RS/CEG, Ms. T. Deepa, PG Scholar/CEG, Dr. K. Malathi, Faculty/CEG, Dr. M. Gulam Nabi Alsath, Asso. Prof., Dr. P. Sandeep Kumar, Faculty/SRM, Dr. T. Rama Rao, Faculty/SRM, Ms. P. Yogeshwari, RS/CEG, Ms. S. Sangeetha, RS/CEG, Ms. S. Padmathilagam, PG Scholar/CEG, "Multiband Reconfigurable Filtering Monopole Antenna for Cognitive Radio Applications," IEEE Antennas and Wireless Propagation Letters, June 2018.

4. Ms. J. Florence Gnana Poovathy, RS, Dr. S. Radha, Prof. & Head, "Hardware Implementation of Enhancement Embedded Reduced Runtime Recovery Algorithm for Compressively Sensed Images," Springer's Wireless Personal Communications, pp. 1-18, June 2018 (Published online).

5. Ms. J. Florence Gnana Poovathy, RS, Dr. S. Radha, Prof. & Head., V. Suganesh, CTS, "Non-iterative CS recovery algorithm for surveillance applications: subjective and real-time experience," Springer's Multidimensional Systems and Signal Processing, pp. 1-21, May 2018 (Published online).

6. Ms. Nirmala Paramanandham, RS, Dr. R. Kishore, Asso. Prof., "Multi-Focus Image Fusion Using Self-Resemblance Measure", Computers and Electrical Engineering, Vol 71, pp. 13-27, 2018.

7. Ms. R. Indhu, RS, Dr. S. Radha, Prof. & Head, Mr. E. Manikandan, RS, Dr.B. S. Sreeja, Asso. Prof., Mr. Ravi Nathuram Bathe, Scientist E-ARCI Hyderabad, "Micromachining Of Biocompatible Polymer Substrate For Cancer Cell Separation Applications", Microsystem Technologies, July 2018.

8. Ms. R. Indhu, RS, Ms. Anni Steffi Mercy J, ME(VLSI), Ms. K. M. Shreemathi, ME(VLSI), Dr. S. Radha, Prof. & Head, Dr. S. Kirubaveni, Asso. Prof., Dr. B. S. Sreeja, Asso. Prof., "Design of a Filter using Array of Pillars for Particle Separation", Material Today Proceeding, vol.5, no.4, pp.10889-10894, July 2018.

9. Dr. S. Kirubaveni, Asso. Prof., Dr. S. Radha, Prof. & Head, Dr. R. Govindaraj, Scientist (RC), Mr.Santhosh N, RS (SSN RC),"Comparative Study on Flexible ZnO Based Nano-Generator Using Schottky and p-n junction Contact for Energy Harvesting Applications", Journal of Nanoscale, July 2018.

10. Mr.E. Manikandan, RS, Dr. B. S. Sreeja, Asso. Prof., Dr.S. Radha, Prof. & Head, Dr.Ravi Nathuram Bathe, "Direct laser fabrication of five-band symmetric terahertz metamaterial with Fano resonance", Material Letters, pp. 320 – 323, Jul. 2018.

11. Mr. E. Manikandan, RS, Dr. B. S. Sreeja, Asso. Prof., Dr. S. Radha, Prof. & Head, and Ms.G. Padmalaya, RS, "Numerical Studies on the Effect of Superconducting Thin Films on Radiation Performance of a Multiband Mid-Infrared Nano-Patch Antenna", Journal of Electronic Materials, pp. 1 – 10, Jul. 2018.

12. Ms. R. Jansi, RS and Dr. R. Amutha, Prof., "A novel chaotic map based compressive classification scheme for human activity recognition using a tri-axial accelerometer," Springer's Multimedia Tools and Applications, pp.1-20, June 2018 (Published online).

13. Ms. P. Nirmala, RS, Dr. R. Kishore, Asso. Prof., "Swarm intelligence based image fusion for noisy images using consecutive pixel intensity." Springer's Multimedia Tools and Applications, pp. 1-19,June 2018 (Published online)

14. Mr. Maran Ponnambalam RS., Premanand Venkatesh Chandramani Prof., "Wideband inter-digitated hairpin resonating BPF with multiple CSRRs as DGS for harmonic suppression,", Analog Integrated Circuits and Signal Processing, Springer, August 2018.

15. Ms. Nirmala Paramanandham, RS, Dr. R. Kishore, Asso. Prof., "Multi-focus image fusion using self-resemblance measure," Computer & Electrical Engineering – Elsevier Journal, vol. 71, pp. 13-27, Oct. 2018.

16. Dr. K. T. Selvan, Prof., Prof. K.F. Warnick, "A global vision for academic scholarship and professional development," FERMAT, Education 3, 2018 in the online journal Forum for Electromagnetic Research Methodologies and Application Technologies.

17. Jansi, R RS. and Amutha, R. Prof., published a paper titled "Sparse representation based classification scheme for human activity recognition using smartphones", Multimedia Tools and Applications, pp.1-19, 2018.

18. Dr. S. Esther Florence, Asso. Prof., Dr. R Vimal Samsingh, Asso. Prof./Mech and Vimaleswar Babu reddy UG/Mech, "Artificial intelligence based defect classification for weld joints" 2018 IOP Mater. Sci. Eng., pp 1-13, 2018.

19. Dr. S. Sakthivel Murugan, Asso. Prof., "Studies on water column nutrient distribution and sound profile variations along coastal region of India", Journal of Acoustic Society of America (JASA), vol. 144, no.3, pt.2, pp.1948, September 2018.

20. Dr. S. Sakthivel Murugan, Asso. Prof., Mr. K. Somasekar, " Segmentation of underwater acoustic images by FCM with EMD", Journal of Acoustic Society of America (JASA), vol. 144, no.3, pt.2, pp.1974, September 2018.

21. Ms. R. Indhu, RS, Dr. S. Radha, Prof. & Head, Mr. E. Manikandan, RS, Dr. B. S. Sreeja, Asso. Prof., Mr. Ravi Nathuram Bathe, Scientist E-ARCI Hyderabad, "Fabrication of silicon microstructure for cell separation using ultrashort laser ablation", Microsystem Technologies, pp. 1-6, 2018.

CONFERENCE PRESENTATIONS

1. Ms. A. Rekha (UG-ECE 2014-2018 batch), Ms. Sowmya, Bhatraju (UG-ECE 2014-2018 batch), Ms. S. Srivaishnavi (UG-ECE 2014-2018 batch), Dr. N. Venkateswaran, Prof., "Real-time Haze removal for visual surveillance," International Conference on Recent Trends in Engineering and Technology (ICRTET - 2018), St. Joseph's Institute of Technology during 4th & 5th May 2018.

2. Ms. S. Sasipriya (PG-CS 2016-2018 batch), Dr. B. Ramani, Asso. Prof., Dr. N. Venkateswaran, Prof., "Comparison of Haze related Priors using Phase Unwrapping in Single Image Dehazing" International Conference on Recent Trends in Engineering and Technology (ICRTET - 2018), St. Joseph's Institute of Technology during 4th & 5th May 2018.

3. Mr. V. Lingasamy RS, B.Pavankumar RS, Dr. K. T. Selvan, Prof., A. Patnaik, and R. Jyoti, "Investigations on wideband sub-wavelength, and stub loaded reflectarray elements for Ku band", Proceedings of International Conference on Antenna Innovations and Modern Technologies (iAIM), Bangalore, 24th – 26th Nov. 2017 (published in July 2018).

4. Ms. M. Akila, RS, Mr. V. Lingasamy, RS, and Dr. K. T. Selvan, Prof., "A study on Q of printed antennas as radiators and as reflectarray elements," Proceedings of International Conference on Antenna Innovations and Modern Technologies (iAIM), Bangalore, 24th – 26th Nov. 2017 (published in July 2018).

5. Ms. S. Sasi Princy RS, "Design of Multi-band Terahertz Metamaterial", International conference Optical Society of India- International Symposium on Optics, held at Indian Institute of Technology, Kanpur from 20th to 22nd Sep. 2018. (poster presentation)

6. Ms. Haarika Musunuru (PG-CS), Dr. N.Venkateswaran, Prof., "Optimization and Simulation of Band Pass Filter at 28 GHz for Millimeter Wave Communication," International Conference on Mathematical Computer Engineering (ICMCE-2018), Vellore Institute of Technology, Chennai held during 23rd and 24th Nov. 2018.

7. Ms. Janani Aiyer, Ms. K. V. Swetha, Mr. Aniruddh balaji, Ms. R. Nithya, Dr. N.Venkateswaran Prof., "Detection of Diabetic Retinopathy in Retinal Fundus Images using Convolutional Neural Networks" International Conference on Mathematical Computer Engineering (ICMCE-2018), Vellore Institute of Technology, Chennai held during 23rd and 24th Nov. 2018.

8. Ms. R. Madura Meenakshi, Dr. N. Padmapriya, Dr. N. Venkateswaran, Prof "Two Stage Fuzzy Logic based Noise Removal in Thermal Images" International Conference on Mathematical Computer Engineering (ICME-2018), Vellore Institute of Technology, Chennai held during 23rd and 24th Nov 2018

9. Ms. E. Srithaladevi, Ms. R. Nithya, Dr. N.Venkateswaran, Prof. "Automatic Classification of OCT Images for Diagnosis of Retinal Disorders Based on Convolutional Neural Network," International Conference on Mathematical Computer Engineering (ICMCE-2018), Vellore Institute of Technology, Chennai held during 23rd and 24th Nov. 2018.

CONSULTANCY SERVICES

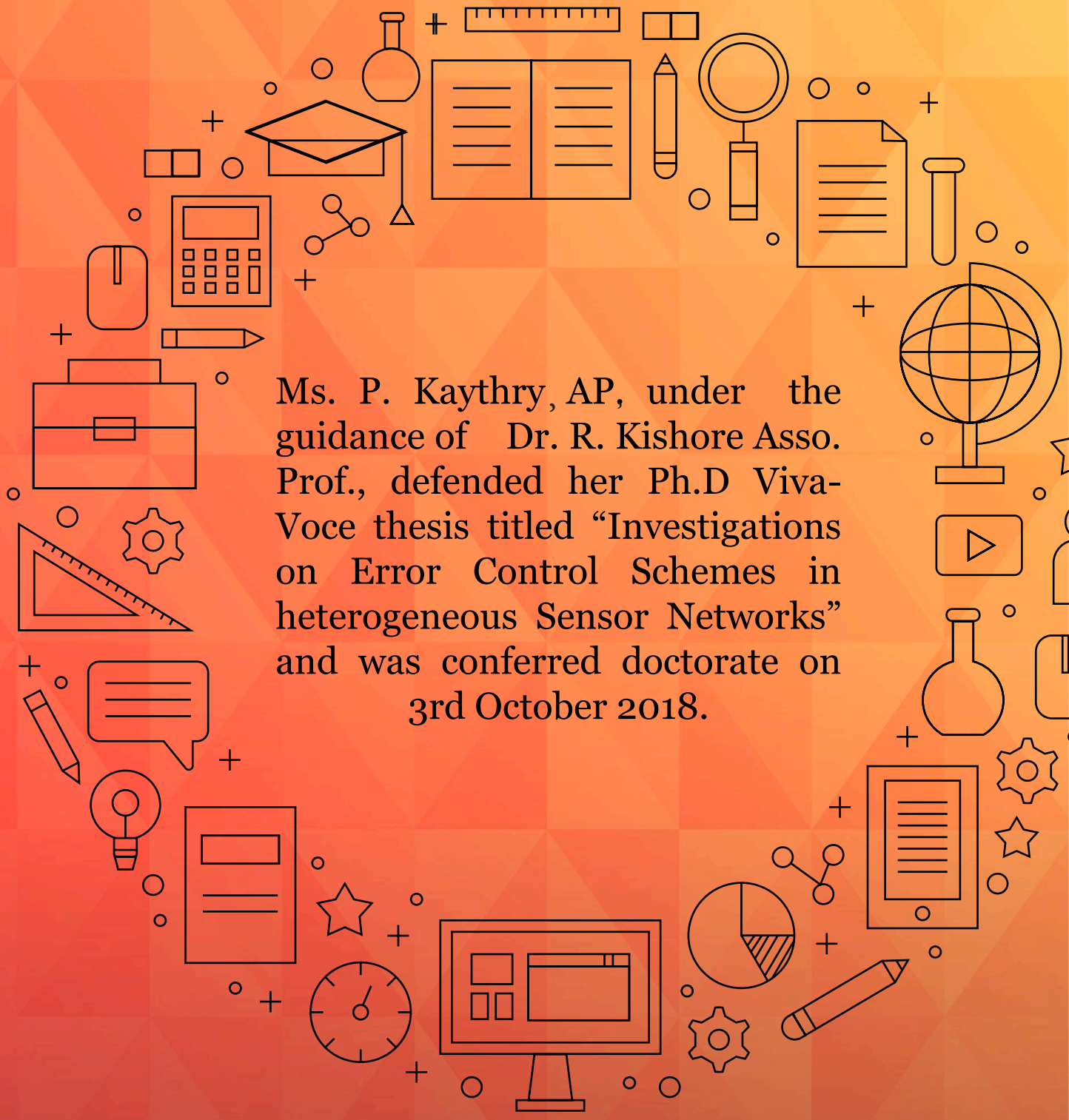
1. Dr. R. Jayaparvathy Prof. and Dr. M. Gulam Nabi Alsath, Asso. Prof. visited the Anthiyur Forest range and installed the Elephant intrusion alarm system from 13th to 16th Jul. 2018. The total project cost is Rs. 2.17 Lakh.

2. Dr. S. Radha, Prof. & Head., Dr. S. Ramprabhu, Asso. Prof., Dr. M. Gulam Nabi Alsath Asso. Prof., and Dr. S. Esther Florence, Asso. Prof., carried out a consultancy work amounting to INR 10030 on "Antenna Measurements" for the research scholar from PSG College of Technology on 4th Sep. 2018.

3. Dr. S. Radha, Prof. & Head., Dr. M. Gulam Nabi Alsath Asso. Prof., Dr. S. Ramprabhu, Asso. Prof. and Dr. S. Esther Florence, Asso. Prof. carried out a consultancy work amounting to INR 10030 on "Antenna Measurements" for the research scholar from Vels Institute of Science, Technology & Advanced Studies on 7th Sep. 2018.

4. Dr. S. Radha, Prof. & Head., Dr. S. Ramprabhu, Asso. Prof., Dr. M. Gulam Nabi Alsath Asso. Prof., and Dr. S. Esther Florence, Asso. Prof. carried out a consultancy work amounting to INR 5900 on "Antenna Measurements" for the research scholar from VIT Vellore.

FACULTY UPDATES



Ms. P. Kaythry, AP, under the guidance of Dr. R. Kishore Asso. Prof., defended her Ph.D Viva-Voce thesis titled "Investigations on Error Control Schemes in heterogeneous Sensor Networks" and was conferred doctorate on 3rd October 2018.

STUDENTS CORNER

STUDENT CO-CURRICULAR ACTIVITIES

STUDENT EXTERNAL FUNDING & PROJECT DISPLAY

1. Dr. R. Kishore Asso. Prof., Arunkumar B (ME-CS), and Praveen S (ME-VLSI) design won the third prize for the project titled "Continuous monitoring of the condition of Railway tracks" under the category "Digital India" in Students Engineering Model Competition-IISF 2018 held at Lucknow on 6th and 7th Oct,2018.

2. Dr. S. Joseph Gladwin Asso. Prof. and Dr.S.Sakthivel Asso. Prof. along with four students of II year ME Communication Systems participated in "Students Engineering Model Competition" in India International Science Festival at Lucknow on 6th and 7th Oct.2018.

3. Dr. S. Joseph Gladwin along with three students of II Year BE - ECE participated in Chief Minister's Award for Excellence in E-Governance for students, on the topic "E-Kissan" held on 8 th September 2018 at Chennai.

INTERNSHIP / FIELD VISITS

1. Mr. V. Lingasamy, RS visited SAC - ISRO, Ahmedabad for:
(i) Review and discussions on project progress for the release of second year grant
(ii)Discussions on theoretical analysis and synthesis of shaped reflect arrays from 18th to 22nd Jun. 2018.

WORKSHOPS/SEMINARS

1. Mr. R. Rajesh, RS. attended workshops on "Conceptual Practices of IOT" & "AI for Engineering Applications" during May 4 th and 5 th 2018 and "Hands on Training in SDR Platform and IOT based Wireless Sensor Networks" during May 29-30, 2018 organized by St. Joseph's Institute of Technology.

2. Ms. S. Sasi Princy, RS, and Mr. E.Manikandan RS attended a workshop on "Metamaterials and Terahertz Technologies" and "Micro and Nano Fabrication" on 19-09-2018 held at Indian Institute of Technology, Kanpur.

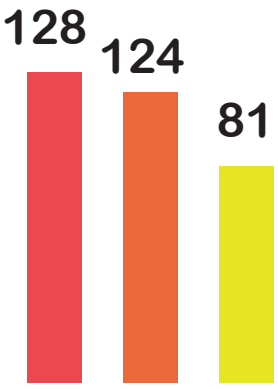
3. Ms. N. Ambika, RS, attended a workshop titled "Artificial Intelligence and Machine Learning" Organized by department of Information Technology, on 6 th & 7 th Sep. 2018 at SSNCE.

4. Ms. L. Sathyapriya, RS attended the national workshop on the topic of "Blockchain Technology, Platforms and Security" conducted by Society of electronic transactions & security (SETS), Taramani, Chennai on 12 th Oct. 2018.

5. V. Lingasamy, Research Scholar attended a Seminar on the topic "Terminal antenna design for future wireless" by Prof. Buon Kiong Lau at IIT Madras, Chennai on 2 nd Nov. 2018.

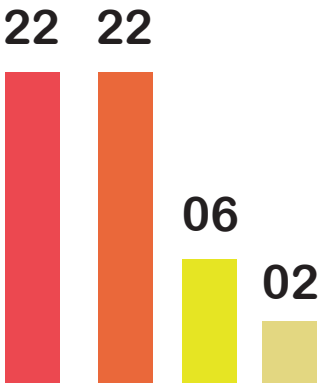
PLACEMENT REPORT

UG:



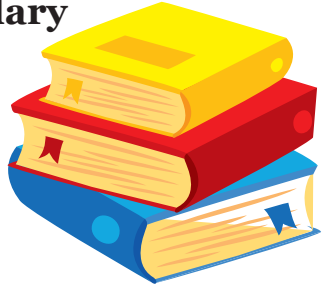
37 No. of companies visited
124 Total no. of offers

PG:



33 No. of companies visited
08 Total no. of offers

- Total No. of Students Registered
- Total no. of eligible students
- Total no. of students placed
- No. of Students Offered Internship with salary



STUDENT EXTRACURRICULAR ACTIVITIES

NSS & YRC ACTIVITIES

1

Ms P. Kaythry, NSS PO with 45 NSS Volunteers initiated Organic farming and continuously working for the same at SSNCE.

2

Ms P. Kaythry, NSS PO, with NSS Volunteers of SSNCE collected Rs.40, 000/- cash amount, new dresses, bed sheets, groceries towards the Kerala Flood relief. Also 20 volunteers worked for the same for AID INDIA and NGO from 18th to 22nd Aug. 2018.

3

Ms P. Kaythry, NSS PO organized NSS Orientation programme for first year NSS volunteers on 30th Aug. 2018 at Central seminar hall between 3 pm and 5 pm. Around 100 first year students attended the event.

4

Ms. P. Kaythry, NSS PO along with NSS Unit organized a seminar for students at SSN Central seminar hall. Dr.Kulandaisamy, director of Gandhian peace foundation delivered a talk on the topic “Gandhian Peace Way”.

5

Dr. S. Joseph Gladwin coordinated the One day YRC Orientation program for first year UG students on 29 October 2018. Prof. PulavarManicam, Kancheepuram district secretary and Senior member of IRCS, Tamil nadu branch was the invitee for the program.

6

Dr. P. Kaythry, Asso. Prof. &Dr. P. Sangeetha, Asso. Prof./Civil (NSS POs) and two NSS Volunteers attended one day programme on “Meet on Shift towards opportunities in Nation Building for NSS Students” at Intellect Office, Navalur - Ullas Trust (CSR initiative) on 9th Nov. 2018.

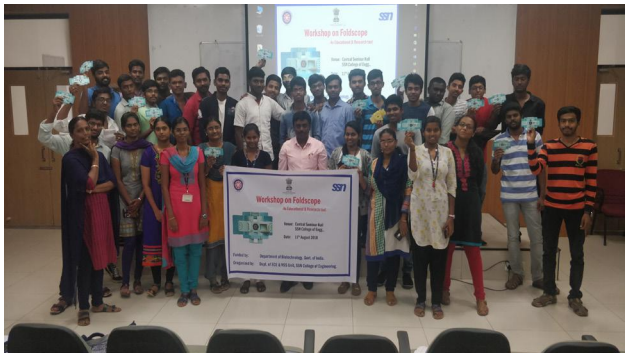
7

Dr. P. Kaythry, Asso. Prof., along with NSS Unit of SSN organized “Can Do” Workshop for 9th grade students of Paiyannor Govt. High school, Kelambakkam Govt. Higher Secondary School, Govt. Boys Higher Secondary School, Thiruporur, Govt. Girls Higher Secondary School, Thiruporur at our College Main Auditorium Nearly 450 young minds were benefited by this workshop on 26th Nov. 2018.

8

Dr. S. Joseph Gladwin, along with YRC team visited few Government Schools in Tiruporurtaluk area and had discussion regarding Infrastructure Enhancement to be taken up as a project along with SSN YRC.

GALLERY



The Department of ECE is proud to share that the following students of 2014 - 2018 batch joined various reputed Universities in India and abroad for higher studies. The Department congratulates and wishes them success in all their future endeavours

Sl.No	NAME	Qualifying Exams (Higher Studies)					University Reported for Joining
		GRE	TOEFL	IELTS	CAT/ GMAT	GATE	
1	AKHILESH VENKATASUBRAMANIAN	316	101				NCSU
2	GAYATRI GOPAL	322	112				UCSD
3	INDULAKSHMI S	300	111				TU Kaiserslautern
4	KARTHIKA D S			7.5			NTU
5	KIRAN Y	321	114				GeorgiaTech
6	KIRUTHIKA K						IIIT-H
7	KRISHNA S	320	114				UCRiverside
8	KRITHIKA V	316	114				CMU
9	MOHANA MOULI KRISHNAN M	307	101				UTD
10	NISHANTH VIMALESH	321	106				NCSU
11	NIVEDITHA SHANKAR	312	115				NCSU
12	POORANI R	317	112				UMICH
13	PRATYUSH YADAV					415	IITM
14	SANJANA S MALLYA	318	117				CMU
15	SATCHIT SIVAKUMAR	340	120				GATECH
16	SHAROON MS	321	118				UCSD
17	SHRUTHIE V				MAT98.7		IBS Hyderabad
18	SIVASANKAR P	322	115				UCSD
19	SRIVAISHNAVI S	313	111				UCSD
20	SRUTHI K	308	107				NCSU
21	SUPREETA VENKATESAN	309	106				UMN
22	SWATI RAVICHANDRAN	328	116				CMU
23	VARSHA S	316	106				UCSB

Thanks to Alumni

Dr.S.Sakthivel Murugan, The PG Alumni Staff coordinator, would like to thank the alumnus Mr.Kannan (1997 -2001 Batch) & Mr. Narendran (1997-2001 Batch) for guiding and referring Mr.Aravindhan 2018 batch for his placement in Synophic systems pvt. ltd., This is an outcome of the one day workshop " A day with an alumni for future alumni V.10" conducted last year by our department in association with our alumnus.

CLUB REPORT

IEEE Communications Society and the Tech Club of ECE department were very active during the odd semester (July - November) of 2018 conducting various workshops, events and guest lectures.

IEEE Communications Society

The IEEE Communication Society (COMSOC) organised many events, guest lectures and workshops during the odd semester of 2018 .

Event : Workshop on basics of MATLAB

Department of Electronics and Communication Engineering – Communications Society Student branch organized a session on "Introduction to MATLAB" on August 1st, 2018. The session was conducted by pre-final year students of the department of ECE, SSN College of Engineering. The session was attended by 47 students from the second year of ECE. The students were briefed about the basics and potential applications of MATLAB in the two-hour session, at the end of which they were made to implement the concepts and create interactive graphical user interfaces. The concepts were delineated through a presentation which enabled thorough understanding for the participants.

Event : Intra-college event - CORONA

Department of Electronics and Communication Engineering in association with Communications Society Student branch organized 2 events - Mindsweeper and Minutronics - as a part of CORONA, an intra-college technical fest, on 5th September, 2018. The events were attended by 60 teams, each comprising of two members. Participants were tested on the basics of electronic devices, digital electronics, communication systems and technical aptitude. The top 3 teams were awarded with certificates and cash prizes.

Event : Inter-college event - INVENTE

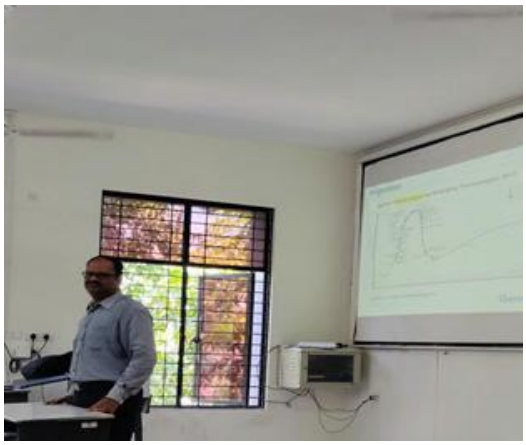
Department of Electronics and Communication Engineering in association with Communications Society Student branch organized a technical contest "Junkyard Jumble" as a part of INVENTE, a national level technical symposium, on 22nd September, 2018. The event was attended by 43 teams, each team comprising of 2 members. Participants were made to build working prototypes in any one of the following domains: Communication Systems, Digital Electronics, Advanced Electronics and Mechanical Contraptions. The top 3 teams were awarded with certificates and cash prizes.

Event : Talk on IoT and Energy Management

The IEEE Communications Society Student branch organized a guest lecture on the topic "IoT and Energy management" on 26th September, 2018. Mr.Hari from Caiser, a research and training centre for Robotics, AI and IoT, delivered the talk. The lecture covered topics such as its relevance in today's technological industry and its future applications followed by a questionnaire session. The 90 minute talk was attended by 25 students.

Event : Guest lecture on dipole antennas

The IEEE Communications Society Student branch organized a guest lecture on the topic "For better, for worse- A story of two dipole antennas" on 2nd November, 2018. The lecture was delivered by Professor Buon Kiong Lau, Lund University, Sweden. The lecture was attended by 25 Research Scholars and post-graduate students.



TECH CLUB

The aim of the ECE Tech Club, since its inception, has been to promote technology and engineering related activities among the students of ECE and other departments. With this objective in mind, the Tech Club, in the odd semester of 2018, conducted sessions almost every week on a variety of topics. Several other events such as 24 hour hackathon during inter college fest INVENTE and Corona - an intra-college techfest, also feature in the Tech Club's dossier this semester.

Event: Talk on MS application and admission

We kicked off this term by inviting our immediate seniors, who just graduated, to share their experience with the application process for higher education, MS. This provided a comprehensive view of the overall process of MS applications and the various requirements that the students must fulfil to be able to secure an admit from some of the top universities. The session was attended by 2nd, 3rd and 4th year UG students.

Event : Introduction to various domains in ECE

A session was held to introduce the second years to the various domains of ECE. The objective of the session was to enable the students to better understand the value of their degree and the types of employment opportunities they had after graduation. The session also aimed to inspire the students to work on projects and pursue the research opportunities in various domains. Following the introductory session, the students were grouped into various domains of their choice for specialising in that particular domain over entire semester.

Event : Course on Robotics

A comprehensive three session course was conducted on basic robotics. Participants were first familiarised with the concepts of embedded systems and robotics. Following this they were taught how to programme the microcontrollers, assemble the robots and finally implement the logic structure and test the robots. The sessions were attended by second and third year UG students.

Event : Basics of Computer Vision and Machine Learning

Sessions were conducted on computer vision and machine learning. The basics of python programming was taught to the participants followed by the installation of various dependencies required. The fundamental concepts of machine learning were taught. Operations on images such as thresholding, segmenting, and contour detection were also covered. Students were encouraged to use the concepts learnt in small projects of their own. The sessions were attended by second and third year UG students.
Tech Club now has an official github repository used for uploading the session materials.

Event : CORONA 4.0

Tech Club of ECE organised the fourth edition of the annual intra-college technical fest CORONA in association with the IEEE Communication Society on 5th September 2018. Tech club held seven events namely Risc It, DISPRO, Socket, Line Follower, Sherlock Ohms, Neuro Quiz and a 24 hour drone hackathon, “FlytCode”. Over 315 students participated in the events and prizes worth over Rs. 15,500 along with gift vouchers were distributed to the winners.

Event : #AI4GOOD Hackathon - INVENTE

As a part of Invente 3.0, SSN’s National Level Tech-fest, Tech Club organised #AI4GOOD Hackathon sponsored by IBM OpenPOWER, in association with Object Automation and H20.ai. as one of the star events for the fest. Nearly 45 participants from 10 colleges participated with 10 teams being shortlisted for the final round. The event featured a 3 hour workshop conducted by experts from IBM, H2O.ai and Object Automation about the Power9 system and its use cases, followed by a 24 hour hackathon to build an application involving AI that can enhance safety, healthcare or governance.

Participants put forward brilliant prototypes that leveraged AI, within the short span of 24 hours. The products were evaluated in terms of Innovation, Implementation and Marketability. The winning solution was a web app named Cassandra, which provided personal healthcare assistance. The runner up developed a system to detect missing elephants, which sent real time alerts using an Ad-hoc system.

Other ingenious solutions that were presented included an edge device that can provide real time health statistics of pregnant women, an app that can detect multiple types of cancer, and an app that can predict the amount of water inflow from rivers.

CORONA 4.0 - A Report

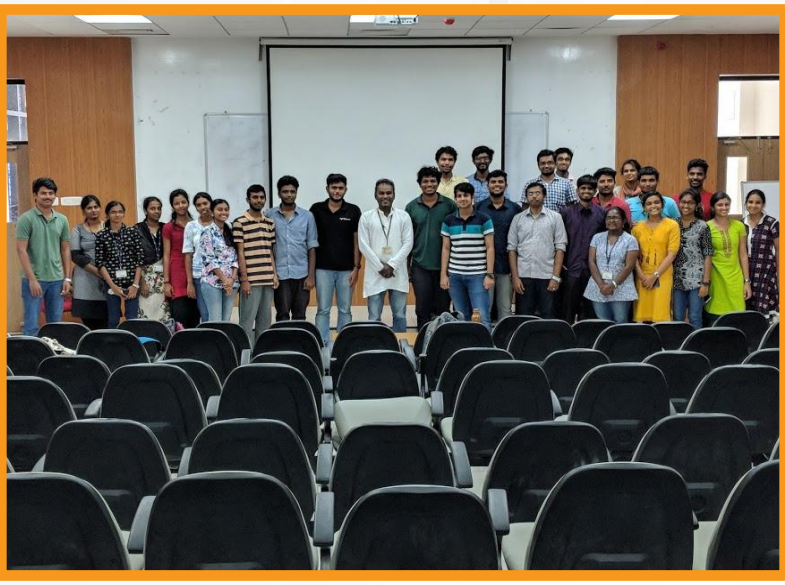
The Tech Club of ECE organised the fourth edition of the annual intra-college tech fest CORONA on 5th September 2018. It was held in association with the IEEE Communication Society of ECE department. The event was organised in partnership with two startups - Altsense and FlytBase.

Corona 4.0 had a total of 9 events, namely,

1. RISC IT
2. DISPRO
3. NEUROQUIZ
4. SHERLOCK OHMS
5. LINE FOLLOWER
6. SOCKET
7. FlytCode
8. MINUTRONICS
9. MINDSWEEPER

Over 315 students participated in the events and prizes of over Rs. 15,500 along with gift vouchers were distributed.

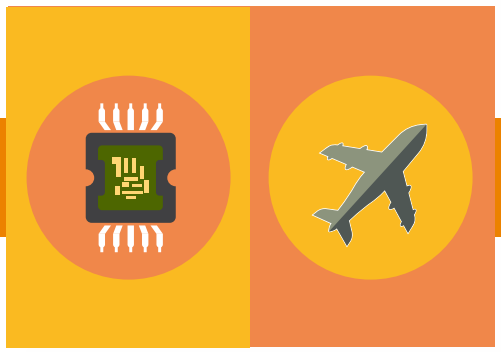
The flagship event of Corona 4.0 was FlytCode - a 24 hour drone Hackathon sponsored by startup, FlytBase. It was held on 7th and 8th September, 2018. Around 13 teams, each comprising of two members, participated. As drones continue to find applications in a wide range of verticals, such as, industrial inspections, surveys, emergency response and delivery, there is a need for development of innovative software algorithms for automation of these missions. FlytCode, a software hackathon, was designed to promote the development of such automated commercial drone applications.



FlytBase Internet of Drones (IoD) platform was made available to all participants. This included FlytSim, a drone application simulator, to help developers test and evaluate their applications in software, without any dependency on drone hardware. Various other tools, including, APIs and SDKs, were also made available to support faster development of complex and powerful drone applications.

A workshop was conducted prior to the hackathon, in order for the participants to get familiarized with the tools that are to be used. The winners were offered internship opportunities and given online credits that can be redeemed along with one to one online mentorship. The winners are M.S. Praveen Kumar and O.S.Sarjana from ECE, final year. Their solution was “Farm-Mate 1.0: Automated Detection and control of Agricultural Pests”. The runners are Sakthi Ganesh M and Vignesh R from EEE, third year.

TECH AND TRAVEL



Winter and summer breaks stopped being synonymous with vacation after admission to college. To complete these four years with as much drive as the day we started out seems almost impossible to achieve. With no room to blow off steam, one starts to feel overwhelmed.
But what if we said you could vacation while you work? Sounds too good to be true? It's not.
Students branching out to innovative startups for internships, resulted in the discovery of some very cool strategies that make work, a vacation!

Read on to know more about some exciting experiences from our tech travellers!

Barath Kumar from III year underwent an internship at a solar based company called Sunlit Future in Auroville. He shares his experience with us.

sunlit future
solar energy solutions

I did my internship in a company called Sunlit Future. It is a solar energy solution company based in Auroville, Pondicherry. Their aim is to design and install solar panels and generators at offices and households. They also focus on the design and implementation of solar powered water pumps. I underwent a month long internship. During the course of my internship I was sent to various sites for inspection and installation and gained exposure in designing solar water pumps as well. Some of the sites that I worked in were Sri Aurobindo ashram in Pondicherry, a school in Chengalpet, a missionary church in Trichy and a hospital in Cuddalore. Working on-site helped me learn a lot about the working of a solar based system. I even got the opportunity to instruct a team during one of the projects!
The best part of my internship, however, was the stay at Auroville. Auroville is a small enclosed area with people from around the world. Auroville is beautiful, peaceful and an ideal place to stay and to work. They have different organizations to promote different cultures - African, Italian, French, European, American and Indian pavilion to name a few. One gets to mingle and interact with people from different countries and get to know

their culture and tradition. One of my colleagues at Sunlit Future was a high school graduate from Germany. Learning never stops in Auroville. During my last week at the internship, I travelled to Orissa on a project. Our assignment was to install solar powered water pumps in 24 villages free of cost. These villages do not have electricity connection. We installed solar powered water pumps to ease their hardships. They use these pumps for irrigation and domestic use. They thanked us profusely for this initiative and I was very happy that I could help them. This definitely was the best part of my internship!

The whole experience taught me a lot about life and of course about solar pumps. I am indebted to sunlit future for giving me such amazing memories. I recommend everyone to visit Auroville at least once for its peaceful life and varied cultures.

- Barath Kumar
III year A

Sundar and Taruna from III year underwent a month long internship at Ghost Vision. We caught up with them to know about their experience.

Ghost Vision is a company, headed by Mr. Kumar Mridul who is an alumnus of IIT-Madras. The company focuses on designing and developing Augmented Reality (AR) apps and headset.

Sundar and Taruna were selected as application development interns. They primarily worked on a game app which uses real time camera feed as background for the game. They used C# (C-sharp) language inside a software called 'Unity' along with a library called 'Vuforia' which supports the development of augmented reality apps.

Although they had a lot to learn, they received immense help and support from their fellow employees which made working at the office a pleasure. Even the CEO was approachable and equanimous. The workforce was diverse since there were employees and interns from different fields and different states making it a very enriching experience for them. Since Ghost Vision is a startup, there were no rules to follow or fixed working hours. They worked for an average of three to four hours a day but ensured that they completed the assigned project within deadline.

Many people confuse the term 'internship' with 'workshop'. In the latter, the individual has to pay for what he/she is learning. Whereas, in the former, a company hires individuals to work on a project.

"One internship, especially a research internship, done thoroughly will lead to publication of a paper which sits on your profile forever. If it's a company internship, you get PPOs and LORs from the company which also enhance your resume" says Sundar.

On the whole, the number of internships is not important at all. It is the amount of knowledge one gains during the course of the internship that matters.
Even though Sundar and Taruna did not work on projects related to ECE, it was a holistic learning experience. In addition to the the technical expertise that they gained, they learnt how to be professional, how to prioritize their work, and how to meet deadlines. They thoroughly enjoyed their time at the company and wished they had more than just one month there.

Taruna
3rd year

Sundar
3rd year

- Anirudh Lakshminarayanan
  II year A

CAMPUS STARS

Deciding between a job or higher studies is a choice that nearly every engineer dreads to make. Somehow, the decision is never easy. We are often advised to make an 'informed' decision and 'follow our passion'. We decided to interview two immensely talented individuals who decided to traverse different paths after college - one chose work, other chose higher studies. They answer some of the frequently asked questions, give a few pointers and reassure us that the choice may be not that difficult after all. Read on!

Placements - The very word strikes terror in the hearts of most graduates. The scramble to secure a job in this highly competitive day and age puts immense pressure on most young people. So how does one prepare oneself for the dreaded but necessary ordeal of placements? Most importantly how does one achieve the goal of getting a job in one's dream company? To give you answers to these questions, we caught up with Mr. Roshan Arvind, alumnus of our department (2014 - 2018) who works in tech giant Amazon. Here is an excerpt from the interview.

1. What is the scope of employment for engineers from private engineering colleges?

From my experience, I've seen that there are a lot of opportunities for ECE and CS based careers. Campus placement at SSN definitely seems to be getting better year by year, but it's important to remember not to restrict yourself to only those companies.
There are a lot of companies that are working on exciting things at the moment, and the best way to get to know them would be to develop an interest in a field and keep yourself updated on what's going on in the industry.

CAMPUS STARS

2. What can one expect from placements? What can be termed unrealistic expectations?

Remember that companies are not looking for the smartest candidate on the campus. They look for a candidate with the proper attitude, someone they believe would fit in well within the team.
Effectively communicating with the interviewers would make you a very attractive choice for them.

Speaking about unreasonable expectations, expecting a high pay would be one. There are a lot more things to consider apart from the pay, and sometimes a job that pays you well may not be the right fit for you. Another would be to expect a smooth interview process. One has to be prepared for anything. The first few interviews might be a little soul crushing, because getting rejected for something you feel qualified for takes a bit of time to get used to. But it's important to not let them get to you or affect your self confidence. Try and understand what was lacking in the interview process and ensure that you don't make the same mistake again.

3. How does one select companies based on career interests and goals?

One must consider several criteria before choosing a particular job such as :
a. What would you learn by working there?
b. What opportunities could this job lead to?
c. Would working there add value to your profile?
d. How much time would you have to yourself to pursue something else?
e. How much the job would pay?

Often, we choose a company/role solely based on pay, and don't consider the others. I recommend pondering on the other questions as well before choosing a company.

4. Does one have to prepare for core and non-technical companies differently? What are the strategies you would suggest?

The core fundamentals of preparing for a role would be the same. Take some time and get to know what you would be doing there by researching online or talking to someone who works there and prepare accordingly.

If you have a particular company in mind, familiarising yourself with the interview process will make you more confident. Specifically for non technical roles, try to improve up your public speaking skill. It will give you an edge during group discussions, debates, or during the interview itself.

5. Ethical question: Is it fair to decline a job offer citing MS admissions? Is it better to forgo placements instead?

I'm going to be a bit biased on this question, since I saw a couple of people declining offers citing MS as the reason while attending interviews myself. There are two reasons why I feel it should be curbed:

a. There is a lot of effort spent in selecting a candidate. When the candidate ends up rejecting the offer, it generates an ill repute for the university The company might not be willing to return the next year for placements, which will affect the next batch.
b. It not only affects the next batch but may also affect your peers. Your peers who might not have MS ambitions and who just missed getting selected by the company will have lost the opportunity to work in their dream company.
If you're looking to apply for universities, but still want to have a back up, I highly recommend looking for a job off campus. While the process may be slightly complicated, there would be no collateral damage while rejecting the offer.

6.What kind of package can the students at SSN expect?

Well, that keeps changing year by year at SSN, but in general, we can expect to see at least 5-10+ companies that pay 9 Lakh+ salaries. Most other companies pay somewhere between 4-9 Lakhs. Usually, it is the tech giants that pay the highest salaries.

7. Are there any ECE electives that would give the students an edge in placements?

It would depend a lot on the field the person is interested in, but the chosen elective should be a starting point for deeper research in the field. Electives do not generally dive deep into a particular area, so taking up additional courses in that subject will be useful.

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8. Are there any special areas that students must concentrate on to get into Amazon?

Most of what I work with, requires good knowledge of networking and operating systems. If you're looking to switch to a career in Computer Science, I'd highly recommend:

a. Taking up programming and learning at least one programming language with focus on algorithms and data structures.
b. Learning how Linux OS works and how to write bash scripts.
c. Learning how networks fundamentally work. For example, what happens in the backend when you open up a browser and load a page.

If you are looking to work in an SDE (Software development engineer) role, profound knowledge of data structures and algorithms would play a major role while preparing for interviews.

9. How was the interview procedure during Amazon hiring? And what was your approach to tackling it?

My interview process involved a digital screening round, followed by three technical rounds and one non technical round.

The technical rounds involved testing the core fundamentals of networking, and operating systems. For example, what happens during the boot process for Linux based OS. The non technical round involved a discussion of Amazon's leadership principles, and a few examples of how I had emulated them.

My approach was to understand why the interviewer was asking the question, and what they were testing me for before responding. It did not matter to them that I didn't have the correct answer to a few questions. Being candid with the interviewers, and having a positive attitude during the process will carry you forward.

10. Can you give us an account of your job experience this past year?

It's been about six months since I started working here, and I'm learning something new every day. AWS (Amazon Web Services) evolves continuously, and every day, you see something new. I also love that I can pick up additional responsibilities/projects which interests me or

CAMPUS STARS

might help me career-wise.The management and my colleagues are very supportive. It's been a good journey so far and I definitely look forward to going to work every day!

So there you have it folks. We sincerely hope that the pointers and tips provided by our helpful alumnus will come in handy and enable you to achieve your goals.

- Divya Sanchana
IV year A

Sreeram Krishna Das, an alumnus of SSN ECE (2013 – 2017) who was adjudged the 'best outgoing student' that year, is presently doing his masters in Wireless communication with embedded systems in Arizona State University (ASU). (A person who is known to go with flow of life, he first applied for Wireless but then later switched to VLSI and hence is now pursuing both.) He has a profound interest in Algorithm development and its implementation in the field of Wireless (both cellular- 5G and Wi-Fi 802.11. ax). When he is not working or studying, one can find him playing basketball, sweating it out in the gym or watching his favourite movies. We caught up with him for a short interview.

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1.So, what made you to choose wireless communication and embedded systems over the other options available for an ECE student?

It's simple. I was eliminating the areas that I didn't like and Wireless was the only course left. However, it is difficult to get work in the wireless communication field as most of the wireless jobs are tied with algorithm and code. That's why I chose embedded, which I am learning online. I would recommend all my juniors to know at least one programming language in depth. According to me, some of the important programming languages that one should know are C/ C++ , MATLAB/Python, and Perl.

2.How did you get into Arizona State University (ASU)? Can you give a few tips?

Usually when a student applies for MS abroad, he/she will have a couple of universities classified into three categories - 'Ambitious', 'Moderate' and 'Safe'. (It varies depending on the whole application - SOP, Resume, GPA, GRE, TOEFL). Safe universities are those universities you would certainly get an admit from. I would recommend to apply to 3 safe universities but also try for other universities. I applied to 10 universities and in the end chose to pursue my Masters in ASU. Some of the tips that I would like to give my juniors:

Don't think that your GRE/TOEFL score is low. It's just a filter. Most universities don't judge you entirely based on that score. SOP/LOR/ Resume plays a major role in the selection process. I wasn't aware of this then. Since my GRE and TOEFL scores were low, I didn't apply to many Universities. But I got an admit from 9 universities out of the 10 I applied to because of my strong SOP and resume.
In GRE, my verbal score was poor but my quants score was much better. Universities expect a high quants score from engineering graduates.

3.What advice would you give to your juniors who are confused between pursuing higher studies or choosing placements? Which should they prefer and why?

This is indeed an important decision that has to be made by the student during the final year. I would advice my juniors to make an informed choice.

Choosing to do MS is a big decision. Only students who have the interest and passion to learn and can dedicate the entire 2 years (it is a big deal) should opt for this career choice. Money also plays a role as MS, especially in the US, is a costly affair. If they are financially supported, I would recommend doing Masters. Doing Masters in US is good because of the extensive research opportunities.

I don't have the passion to study nor am I financially strong, but I had the urge to do something big. My ultimate aim was to earn a lot of money by doing a job that I liked. However, I was dead against working in an IT company and wanted to work in a core company. I eliminated GATE because it's tough and chose to do MS. This was a monumental decision for me as I am the first person in my family to move to the US. I even took a loan for financial support. I'm saying this because I know that there will be many students who are capable and have the will and passion to study but are not financially strong. They shouldn't quit this path just because of high cost. Placement is a good choice too. If you get placed in a core company you get to develop skills and knowledge in the field and gain valuable experience. Some might have superb coding skills. For them, IT companies will be a perfect choice.

However placements and MS aren't the only options available to students after graduation. Students can also write GATE and pursue higher studies in IIT/NIT or work in PSUs. There is no dearth of job opportunities for engineers. There is even an Engineering division in NAVY/Air force! More often than not, students do engineering out of compulsion and not because of passion and for them there are many non-tech roles they can choose from. Take some time to ponder as this decides your career. However, once you make a decision it is difficult to change it. It's better to sow a seed that will yield fruits after a few years but continues to yield fruits forever than to sow a seed that yields immediately but will die in a few years. Stay positive and confident!

4.What are your thoughts on engineering students irrespective of their field getting trapped in IT?

IT companies are not as bad as people make it seem to be. There are many departments such R&D, development, testing and support. However it is not advisable for a non IT/CS student to work in test/support role as the work will be monotonous with little scope for development. Instead, I would recommend to gain some CS/IT knowledge and get better jobs in the IT field.

CAMPUS STARS

5.How can students learn and develop skills outside the scope of the curriculum?

There are plenty of online resources such as LinkedIn learning courses, Udemy, Udacity and NPTEL. Internships in industries, startups or research fellowships in institutes like IITs add value to your profile. To be honest, if you study your undergraduate courses well (and I mean "WELL"), your masters would be a piece of cake.

6.Tell us more about yourself. What are your future plans?

My future plan is to take up a job and clear my loan. After earning, I would like to comeback to India and work in the same domain in a highly reputed company. I have other dreams as well. In the distant future, I would like to create a brand like Nilgiris where people can get only organic eatable products.This would establish a direct interaction between me and the farmers. Presently, farmers are affected due to mediators. To help them further, buying the land from the farmers and employing them for a monthly salary will ensure that they get steady wages and also preserve agricultural land instead of it being used for constructions and urban development. I have a lot of big dreams like this but in order to accomplish them I need a steady job now that pays me well to make my dreams a reality.

7.What is your advice to students who chose the same career path as you?

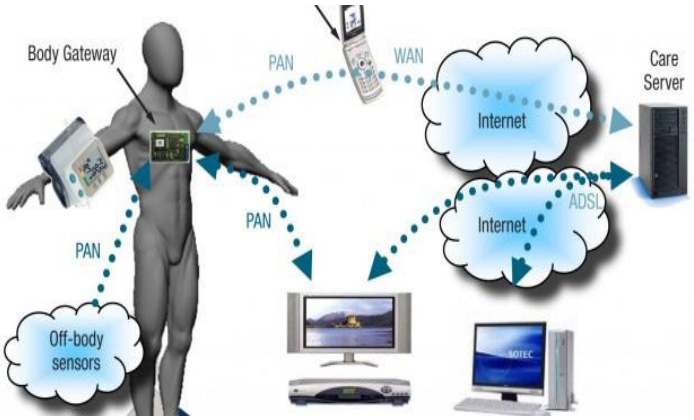
Strengthen your fundamentals. Strong programming language skill is a must. Start networking aggressively as it will be of great help in the future. Lastly, don't be afraid to fail but be ready to get back on track and never give up.

- Poojah. G
  II year B

Study Corner

Electronics and communication as a domain is ever growing. Almost everyday we hear of brilliant advancements and mind blowing discoveries in the world of science. In this edition, we delve into three domains that have been on the rise in recent decades - Medical Electronics, Nanotechnology and Wireless Communication.

Medical Electronics and Wearability



For decades now, there has been continuous advancements in technology by mankind, both analog and digital, the former being the grounds on which the latter was based on. Technology has been made more compact and usable to the point where you can practically wear them for comfortable and convenient use. One such field which uses wearable technology is the field of Medical Electronics, in which the development has come up to the stage where life-threatening conditions are prevented by using small devices in the form of wristbands and rings. The field has numerous applications in the present and has great scope in the future as well.

Questionnaire

Q1 ***What does Medical Electronics mean?***

Medical Electronics is the branch of engineering in which electronics and biology come together for medical applications like medical sensors, scanners, indicators, trackers, prosthetics etc.

Q2 ***What is Wearability?***

Wearability is the state in which one can just wear a product without having to carry it around, by affixing or fastening the product to a body part without disturbing the regular movements of the person who is wearing it, just like our clothes. So, better the wearability, easier it is to market them.

Q3 *Where does Medical Electronics stand in today's world?*

Medical electronics has numerous applications in the present day world. Three common applications of medical electronics are stethoscopes, electrocardiograms and X-ray medical imaging without which you cannot analyse most of the patients' conditions. Thus medical electronics plays a vital role in today's world.

Q4 *Explain about the wearability of medical electronics.*

Medical electronic devices have their wearability in applications such as watches, bands, lenses, even electronic stickers which constantly track the vitals of the patients. Due to the advantage of constant human contact, they provide a prolonged and consistent grid connection, allowing constant stream of data.

Q5 *What are the prerequisites to study Medical Electronics?*

There is no additional requirement to study medical electronics specifically.
- A course on medical electronics does not require any prerequisites apart from strong foundations in basic electronics concepts.
- Knowledge of signal processing concepts would come handy.

Q6 *Based on present syllabus and curriculum of Anna University, is it recommended to pursue a career in Medical Electronics?*

If the student is interested in a career pursuing Medical Electronics, he/she can take up available elective subjects in ECE relating to Medical field as follows:
- Semester V- Medical Electronics
- Semester VI- MEMS and NEMS
- Semester VII- Electronics Packaging and Testing
- Semester VIII- Low Power SoC Design and Fundamentals of NanoScience.

These subjects will provide an insight into the field of medical electronics. Hence we can conclude that YES, it is recommended to pursue a career in Medical Electronics based on current AU syllabus which is more than sufficient.

Q7 *What is the future scope in the applications of Medical Electronics?*

With newer chip designs and increasing demand in consumer and mobile electronics, the future looks bright with designs based on smaller footprints and higher efficiency. Dynamic system designing can be highly optimised resulting in cost-effective medical electronics application with inbuilt functions of device diagnostics and self-test algorithms for error-free service. Even surgical procedures are looking to introduce portability. So, medical electronics has great scope in the future.

Q8 *What is the scope for students in Medical Electronics?*

The Healthcare industry has been growing at a rapid pace in the past few years, with an annual growth rate of 30%. The Indian Healthcare Industry is estimated at US $22 billion and the Medical device market is estimated at US $1.85 billion growing at 15% per annum. With the rapid pace of growth comes the ever increasing demand for highly skilled and well trained Medical Electronics Engineers. Thus the future holds great potential in the field of medical electronics.

Q9 *What is the current research being done in the medical electronics field?*

With great advancements in this field, the 'intelligence' of equipments in medical electronics has increased significantly. Currently, Multiphoton imaging is being used to measure muscle weakness, flexible OLED arrays are being used to detect blood oxygen levels, Artificial Intelligence is being implemented in systems such as smart watches and phone apps to enable advanced health monitoring.
Research can be done in various domains such as Electrophysiology, Medical Imaging, Medical and Cardiac Ultrasound, and Cardiac Rhythm Management in UK in universities like Imperial College London, Sheffield Hallam University, University of Derby, Middlesex University, and University of Cumbria. In the US, Medical Technology Quality, Imaging Science is offered by St.Cloud State University and Rochester Institute of Technology.

Q10 *How does one find a job in Medical Electronics?*

Follow the given steps to find a job as a Medical Electronics Technician:
1. Study Biomedical Technology or Engineering as a 2-year diploma and get certified in it. Earn a Bachelor's degree in Biomedical Engineering, which will also help get placements in biomedical engineering.
2. Gain a minimum of 2-4 years of experience, working for manufacturers and suppliers, and healthcare facilities.
Some of the companies which hire for the position of Medical Electronics Technicians are: Philips, Zebronics, Siemens, Johnson and Johnson, Essilor, Abbott India, Gebbs Healthcare Solutions, Fisher & Paykel Healthcare India.

By
Haricharan. R
II year A

Importance of Understanding Fundamental topics - Focus on Nanotechnology and Wireless Communication

'The science of today is the technology of tomorrow'.
The development in science is so rapid that we need to be in constant touch with the happenings in the concerned field. In order to do that, we need to have a strong foundation and that is where the role of college education is important. The field of Electronics and Communication comprises of topics such as Digital Electronics, Circuits, Signals and Systems, Analog and Digital Modulation, Digital Signal Processing and so on. It is essential to know how these fundamental topics help us understand advanced topics. In this edition, we focus on two subjects which are gaining steam - Nanotechnology and Wireless Communication.

Nanotechnology

Atoms are the building blocks of any object around us. The different arrangements of atoms are responsible for the different properties of elements; for example, they determine how strong or weak the element is or if it can conduct electricity. This gives rise to the possibility of arranging the atoms in a particular fashion to get the desired characteristics. This is however very difficult; atoms are really small and thus very hard to work with. Over the past few years, scientists and engineers have become better at designing and engineering materials down to the level of atoms and because this involves operations at such a minute scale it is called Nano technology. Some examples of developments in this field include:
1. In medicine it involves, involves employing nanoparticles to deliver drugs, heat, light or other substances to specific types of cells, such as cancer cells.
2. In the field of electronics, it focuses on expanding the capabilities of electronic devices while significantly reducing their weight and power consumption.
3. Nanotechnology is being used in several applications to improve the environment. This includes cleaning up existing pollution, improving manufacturing methods to reduce the generation of new pollution, and making alternative energy sources cost effective.

Now what undergraduation (UG) subjects offered in colleges will help us to gain a better understanding of Nanotechnology?

1. BASIC ELECTRONICS ENGINEERING
2. FUNDAMENTALS OF SOLID STATE ENGINEERING
3. NANOCHEMISTRY
4. QUANTUM MECHANICS
5. SYNTHESIS AND CHARACTERIZATION OF NANOMATERIALS
6. SMART SENSOR SYSTEMS
7. CIRCUITS AND SYSTEMS
8. SUPRAMOLECULAR SYSTEMS
9. MICROELECTRONICS AND VLSI
10. ELECTROMAGNETIC WAVES, CIRCUITS AND APPLICATIONS

These are the ten fundamental courses that is important to pursue a postgraduate degree or a job in Nanotechnology. Five out of the ten topics will have been covered by an electronics graduate during UG. Solid state engineering, quantum mechanics and a good understanding of Nanochemistry will boost one's credentials. Thus it can be noted that an electronics engineer will have a very promising and bright career in this field if interested!

Wireless Technology

In recent times, 5G has been the talk of the town. But if we think about it, 6G and 7G are not too far away. When it comes to mobiles and wireless computing, customers constantly demand higher speed. The potential is enormous. Smart cities, connected infrastructure, wearable computers, autonomous driving, seamless virtual and augmented reality, artificial intelligence, Internet of Machines and Things, and much more are still very much untapped. Wireless communication is the future and a career in this would be strong and self-sustaining. Here are the subjects that would be essential for pursuing a career in this domain.

1. Communication theory
2. Signals and systems
3. Wireless resource management
4. Multiple Antenna systems
5. pace-time coding techniques
6. Wireless network and Multi-user system design
7. Sensor technologies for interactive environments
8. High speed communication circuits
9. Electromagnetics and applications
10. Telecommunication

It is clear that in our under graduation program we would cover 80% of the listed topics. Thus in order to develop a strong foundation and to continue working in this field, it will be a cake-walk for an interested communication engineer.

'An investment in knowledge always pays the best interest'.

By
Harini Balasubramaniyam
III year A

Counsel for Confusion

Another year, another semester. New subjects, but same old confusion; placements or higher studies?

We do not blame you. It is normal to be confused about matters that shape our future. Efforts must be made to battle this confusion at every turn. Agreed that both are lucrative options but which one is the right choice for you? An easy answer to this confusion lies in the 3D cycle - Dilemma, Discussion and Decision. We are in a dilemma, now let the discussion begin!

PLACEMENTS 101

Placements - the very word sends chills down one's spine! Placement is the process of companies recruiting students straight out of college. Final year students are chosen for jobs before they bid adieu to their undergrad. Placements can be quite daunting but students at SSN have the distinct advantage of being trained to crack the tests and ace the interviews. Yes, that's right! We've got placement training!

The Career Development Cell at SSN conducts a training programme to equip students to deal with placements - interviews, aptitude and everything that comes along with it. Students entering their sixth semesters are usually required to attend a day of placement orientation, much like the one we had on the first day in the first year of college (sans the stress of making new friends). The students are in for a rude shock when they are made to realise that the journey ahead isn't as easy as they falsely thought.

Before the training commences, students are made to take up a diagnostic test so that a trusted third party contractor (of CDC's choosing) can train students better to ensure the best results.

Generally, the companies that recruit students are split into 3 categories based on the payscale - bulk recruiters, dream companies and super dream companies. Companies that offer close to 3 lakhs per annum (LPA) and end up recruiting in bulk are called Bulk recruiters. Dream companies offer students a slightly higher pay- 5 to 9 LPA. These companies recruit only a limited number of students. To be one among those requires lot of hard work and preparation. The super dream companies are exactly that - super dream. The ones who get recruited are offered a pay package of more than 9 LPA. To be recruited by such companies one must definitely excel in all areas.

The classification follows an interesting tree. Those recruited by super dream companies are exempted from attending any other placement assessment. Understandably so, considering that they have just hit the jackpot, placement wise. Similarly, those recruited by dream companies aren't required to sit for the bulk recruiters.

PLACEMENTS 101

However, climbing “up the tree” is allowed, that is, those recruited by the bulk companies are eligible to appear for dream and super dream company placements. The process of attending the placement is called a placement drive. It lasts for almost the entire of our final year. Several companies are allotted slots through the year so that they may conduct their respective recruitment assessments.

“Sitting” for placements is actually a several step process. While all 3 categories of companies have the same blueprint for assessment, they differ in technicalities. For example, a question paper from TCS will not be the same as Tech Mahindra. But both of them conduct a test and a group discussion before selecting students to attend the final interview. This is typical of bulk recruiters.

The average dream/super dream company starts its filtering out process much earlier. Some companies choose to to do an initial filtering of students based on the CGPA. In addition to testing their aptitude and technical skills, these companies may also sometimes require students to partake in a case study and/or group discussions. This is their way to pick and choose candidates that best fit their company.
Back to the placement training. The duration of training and its methods vary from year to year, but typically, training is split into two - technical and non-technical. In the former, students undergo training in essential coding languages such as C/C++ and Java. It also consists of exposure to aptitude, verbal and reasoning concepts which is tested during the test.

As Indians, most of us have a natural aptitude for mathematics. Those few of us who do not, are conditioned by decades of school system to still be better than our foreign counterparts. However, our competition isn’t with applicants from all over the world yet (Although, that might be the case if you’re applying for higher studies.). You compete for limited jobs with people who have largely been given the same opportunities as you and so, there must be something about you that is unique and that will aid in your placement as well.

PLACEMENTS 101

A Harvard study showed that "85% of one's success at the workplace is attributed to soft skills and only 15% to technical skills". So, to be able to perform well in interviews and group discussions one needs to be able to hold his/her own in a room full of people. Such confidence level requires a sound understanding of one's capabilities, strengths and weaknesses and a strategy to ensure that the interviewer sees the best aspects of your personality. In order to do that, non technical placement training focuses on improving the English skills of students. This includes reasoning skills and verbal ability

Reasoning skills allow us to logically understand a situation and come to a conclusion. These skills can only be improved through extensive practice and diligent work. (Sorry folks, there's no alternative to sheer hard work on this front.)

Verbal ability is by far the most ambiguous component of non technical but the most important. The ambiguity is because of the language itself - English. India follows British English for written purposes but the English that is spoken has got a definitive Indian spin on it. This makes it harder for students to tackle verbal ability tests because English as we know it is not what is considered "right" by the test evaluators ('prepone' , 'cooling glass', 'timepass' are just few of the many words that are unique to the 'Indian English'). How many times have you looked at a sentence and repeated it over and over again in your head trying to decide if it sounds "right" before answering a verbal question? The catch is that, however "right" it sounds in your head, it's almost always isn't what's right and that's because our English (while staying fundamentally similar to the British) has got its own dialect, if you will. This means that one needs to train in British English and not rely entirely on their own English prowess to get them through this section. Because of such, for lack of better term, double standards, a lot of students fall behind in verbal ability even though they've always done quite well in school before. The methods to overcome this obstacle are, sadly, ambiguous as well.

One can always familiarize themselves with the language by watching English television. However, there is a tried and tested method that has stood the test of time - reading.

PLACEMENTS 101

Reading anything and everything is a practice one needs to cultivate now if they haven't done so already. There are certain magazines and newspapers that publish the most informative articles and editorials. Read them thoroughly making note of every new word, phrase and sentence you haven't heard before. You might just be surprised at the complexity of the language. Thankfully, most recruiters do not expect you to speak like Shashi Tharoor. Using simple but grammatically correct sentences to put your point across will ensure you a place among the shortlisted. Another reason that many stress the importance of reading newspapers is that it is imperative that one keeps up with the news from all over the world. This knowledge will come in handy during group discussions and bulk interviews, thus increasing your chances of getting placed.

Something that most students overlook is researching the company they are sitting for. During interviews and group discussions, an easy and sure shot way to impress your interviewers is through your knowledge of the company. Knowing their clientele and their various projects will show them that you're committed and hard working in a way that your resume or your CGPA won't

Most students are in two minds between higher studies and placements. While placement training will certainly give you some exposure to core subjects, it cannot be a preparation guide for higher studies. Placement training focuses more on company based recruitment training which will fall short of the overall understanding of the subject one is expected to have when applying for higher studies. So, in a way these two streams are mutually exhaustive.

Albert Einstein once said:
"Strive not to be of success, but rather to be of value."

As students we must strive to be valuable in any field and success will naturally follow.

- Chinmayi Udaybhaskar
  III year A

When one begins the final year of undergraduate studies, GRE preparation and MS admissions dominate break-time chatter. Students frantically solving problems and quizzing each other on vocabulary becomes a common sight. We managed to catch up with Sarjana from IV year who scored an impressive 334/340 in the GRE.

Here is the transcript:

O.S Sarjana
IV year B

1. First off, how did you feel on getting 334?

Ans: I was in a genuine state of disbelief for a few hours after I saw the score. I did not expect to get such a high score. I found the verbal section easy probably due to my regular reading habit. However the quants section was harder than I expected it to be. 334 , therefore, was a pleasant surprise!

2. How did you deal with stress on the day of the exam?

Ans: My friends who took the test before I did, warned me that stress could easily become my nemesis on test day. I therefore ensured that I was well rested before the test. I had done pretty well in my mock tests and therefore didn't worry too much on the day of the actual exam. I trusted myself and went with the flow. Thankfully, it worked.

3. What strategy (if any) did you follow on the exam day to get such a high score?

Ans: I ensured that I rested well before the exam. I even slept on the way to the test centre! The test requires you to look at a computer for a fairly long time so it is important not to strain your eyes before the test. Also, moving out of the room during the 10 min break helped clear my mind and calm me down.

4. Did you attend any coaching classes? What books did you use / will recommend for other GRE takers?

Ans: I did not attend any coaching classes. In my opinion they aren't really necessary unless you need that 'push' to study. The official GRE books are definitely the best resources for preparation.I would recommend Magoosh apps for the Verbal section and Manhattan 5lb book for Quants section.

5. How did you prepare for the exam then?

Ans: For quants, I initially took a mock test to help me identify the areas I was weak in. I concentrated on these areas, regularly recalling formulae and solving many practice questions.
For verbal, I primarily worked on my vocabulary. Challenging others on the Magoosh app also helped. In the last 3-4 days leading to the test, I only took mock tests, to get used to sitting in front of the computer for 4 straight hours.

6. What daily prep schedule did you follow?

Ans: I prepped for about 4-5 hours a day, with sufficient breaks so I wasn't pressurised. I took about 30 practice questions in each section everyday. I did one new deck of flashcards, and then revised all old decks. Reading books/ news and challenging others on the Magoosh app, during breaks, served to ease the pressure.

7. How beneficial were the mocks?

Ans: Mock tests, especially the official mocks, are the closest you can get to the actual tests. I tried to take my mock tests in distracting environments in order to prepare myself for the worst case scenarios. I also felt that taking them under perfect conditions and without the stress the actual test might cause, will make me feel over-optimistic and set extremely high expectations for myself. Because I did fairly well even with plenty of distraction, I felt confident and less stressed on the exam day.

8. How long should one prepare for the exam to get a decent score?

Ans: The ideal time will obviously vary from person to person. For me, it took about 15 days of preparation. However during these 15 days, I devoted my time completely to GRE preparation. Since it was during the holidays, I had no college work or exams to worry about.

9. When should someone ideally take the exam?

Ans: Taking the test, before you start final year will give you sufficient time to take up the exam once again in case of low scores. Vacations are definitely the best time because then you don't have college, UTs, or anything else that will sap your energy.

10. Finally what advice would you give to future test takers?

Ans: Prepare for the exam diligently. Take a diagnostic test initially to know where you stand and identify your weak areas. Focus more on those areas but don't neglect the other areas. I can't stress enough on the importance of mock tests. Make sure you take each test seriously. And lastly, ensure you are calm and well rested before the actual exam. All the best!

GADGET GIZMOS

State of Processors in 2018

2018 has been the year of processors. The impact that these tiny chips had this year is phenomenal. 2018 saw two 7nm processors - Huawei's Kirin and Apple's A12 Bionic. This was an important milestone as far as mobile computing is considered as it was the first time a 7nm processor was mass produced to be consumed by the common folk.

Before we dive into the article, let me brief you on what a 7nm processor is. Contrary to what many think, the '7nm' in the 7nm processor does not refer to the length of the transistor. It is the smallest measurable feature size on a chip. What does this mean? Well, for starters, 7nm is fancy marketing name and has no VLSI backing to its nomenclature (just like Apple's "Liquid Retina Display"). This means that the 7nm node from Taiwan Semiconductor Manufacturing Corporation (TSMC) need not be similar to the one manufactured by Intel. (Fun fact: 7nm from TSMC is similar to a 10nm from Intel.)

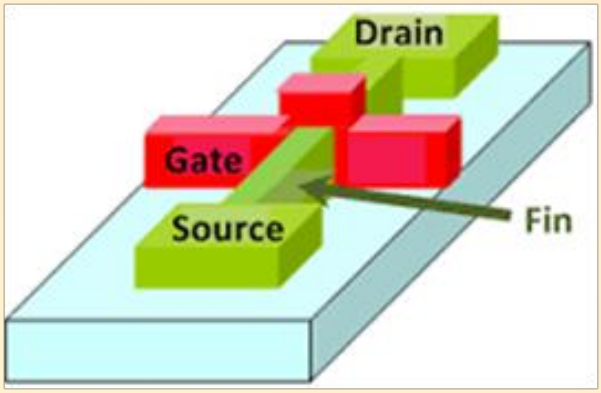
Now, why should we care about the 7nm node? A processor made with 7nm nodes packs in a lot of transistors into a square inch and therefore is dense. The performance of the processor is off the charts and the energy consumption is very low. So your phones and tablets can run faster (yay!) and be energy efficient at the same time (double yay!). However, on the flip side, the manufacturing process is difficult and

as a result, the manufacturing cost of the device can increase. This may be one of the reasons why phone costs are increasing these days. (It's either this or that the companies are way too greedy. Your pick.) The process is so difficult that it took Samsung a decade to get the technology right to make 7nm processors. Why go through this trouble , you ask? Well, a crazy old guy , Gordon Moore (founder of Intel), once said that every iteration of a processor will pack twice as many transistors as its previous generation (Moore's Law) and we are trying to uphold it.

Most of the smartphones releasing next year will be powered by a 7nm chipset as most of the big chip manufactures are now capable of manufacturing them. With Qualcomm working on a Snapdragon 7nm variant, we might even see a 7nm processor in a phone like the pocophone (if you haven't heard of pocophone, google it right now! IT'S THE BEST PHONE SINCE THE OG ONEPLUS).

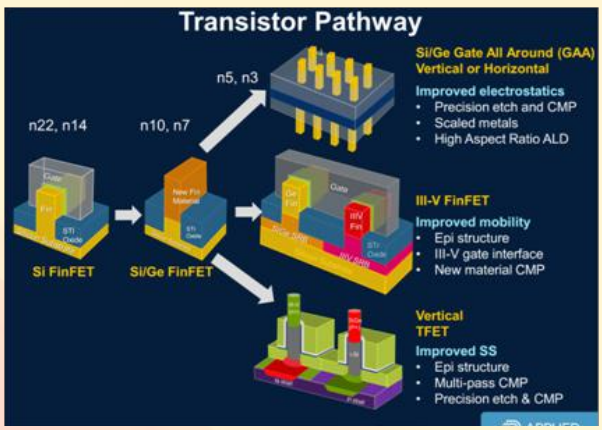
However, it is the life after 7nm that I am worried about. (And frankly speaking, you should be worried too.) In theory, we should see a 5nm node based processor after the 7nm processors. This 5nm would have a much more significant impact than other processor technology known to man. The 5nm node was once thought of as the official end of Moore's law as we know it. More importantly, we might stop using finfets (shown in image) to manufacture processors completely.

For close to a decade, finfet has defined the way we make processors. With sub 5nm technology we would officially be using a transistor called Gate all around FET (GAA).



Difference between Finfet and Gate all around FinFet:

In a Finfet, silicon is deposited on top of the substrate. This was the definite device which made a move up from the traditional 2D device to a 3D device. The excess silicon looks like a fin and hence the name Fin-FET. With GAA (shown in image), the gate is all around the channel. The GAA mixes a 3D node and a 2D node.



Need for GAA:

It is not that it is impossible to manufacture a 5nm finfet based processor. It has in fact been done, but however, there was no significant change in the performance and energy consumed when compared to the 7nm chipset. So after a decade of research, the concept of wrapping the gate on a nanowire was discovered. This resulted in better performance, energy consumption and density.

Manufacturing:

The manufacturing process of a GAAFET is important for a few key reasons. For starters, the gate surrounds the channel. So unlike the typical 3D transistors like the Finfet, we need to break the channel and remove the connection between the "Channel sub-parts". Secondly, the cost of making the processors has been on the rise due to the complicated setup required to etch a 7nm chipset. So the new method must reduce the cost incurred while manufacturing a chipset and in mid 2017, Samsung and IBM came up with a solution. They placed consequent rows of silicon (Si) and an alloy of silicon and germanium(SiGe). The SiGe layer was then removed and replaced with a material with very high K(dielectric constant) which formed the gate of the device.

Performance and Future:

With the current technology, IBM and Samsung were able to pack 30 Billion transistors in a chipset of 50 mm2 area. A report from IBM states that, when compared to Intel's 10nm commercial processor node, the new 5nm node will give a 40% increase in performance and a mind boggling 75% reduction in power consumption thus ensuring we meet the demands of Moore's law. However several computer engineers predict that the Moore's law will not drive research after a 5nm node. We have actually violated Moore's law as every iteration of a processor now takes 36 months instead of 12 months as predicted by Moore. The GAA has extended the validity of Moore's law for a few more years and it will be exciting to see what is in store for the future!

By
Kashyap Ravichandran
IV Year A

AVR MICROCONTROLLERS

GADGET GIZMOS

The Atmel AVR Microcontroller is one of the fast growing devices used under Embedded systems. However, Intel's 8051 family , ARM(Advanced RISC Machine), Freescale (Motorola),Zilog Z8 and PIC from Microchip technology are other controllers used in the embedded industry. All these devices have their own instruction set and architectures. In recent times, companies have begun to sell *Field-Programmable Gate Array (FPGA) and Application-specific integrated Circuit (ASIC)* libraries for different microcontrollers.

However, standouts are the AVR and the ARM processors which create quite a buzz in the fast growing electronic sector.The famous Arduino Uno is a well known beginner kit for working with Cyber Physical System and is itself an AVR Atmega which contains USBasp in-built.

The recent Embedded Buzz!

Embedded system can be stated as a hardware which is generally a processor or a controller with software embedded in it. The software guides the hardware and provides the environment to work in. So, a physical system and a computing platform which controls the physical system together is termed as an Embedded system. Embedded System is thereby composed of three parts,

1. Hardware.
2. Application software
3. Real time Operating system (RTOS) such as Windows , LINUX that supervises the application software and provides a mechanism to let the processor run processes as per schedule by following a plan to control the latencies. RTOS defines a way by which the system works. It sets rules during the execution of application program.

Embedded systems are Real-time.

Major class of Embedded systems are Real time. It is a system whose specification includes both functional as well as temporal notation of correctness. Logical correctness means “to produce correct output” and temporal correctness means “to produce output at right time”. In layman terms, it is not enough if brakes are applied. The brakes have to be applied at the right time.

Now let’s go in detail about Atmel AVR controllers. It is assumed to stand for *Advanced Virtual RISC or Alf and Vegard RISC* (the names of the designers). The AVR itself has a variety of controllers such as Mega, Tiny, Special purpose and Classic. AVR is an 8-bit RISC microcontroller which means that the CPU can work with at-most 8-bits at a time. The term ‘RISC’ tells us that the assembly level (low level language) follows the reduced instruction set.

This AVR controllers generally follows a *Harvard Architecture* which can be stated as a deviation from *Von-Neumann Architecture*. AVR, like an ordinary controller contains the same in-built Timer, Control Registers, Data RAM, Code ROM (Flash Memory), Data EEPROM and I/O Ports. They also have additional features like ADC (Analog to Digital Controller) , PWM (Pulse Width Modulation) and serial interface such as USART, I2C,SPI and USB.

Memory in AVR is composed of Data Memory and Code Memory. This Data Memory consists of 32 General Purpose Input and Output Registers , Special Function Registers(SFR) and SRAM(Static RAM) which are addressed from 0x00 in Hexadecimal. All the arithmetic and logical operations in the CPU are performed only with the help of GPIO Registers. These AVRs have a EEPROM memory to store data that are less frequently used and those that need to be present for a long time. Code Memory consists of all the instructions that has to be fed into the controller and these are executed one by one. A variety of instructions such as LTS, LDS, IN, OUT, STS, JUMP, ADD are stored in the code memory.Each code memory’s width is of 2 bytes and hence the 1K memory location will correspond to a total memory of 2K bytes.

What makes AVR so special?

Unlike Intel's 8051 which uses CISC (Complex Instruction Set), AVR goes with RISC (Reduced Instruction Set computation) which is of great use.

1. In Reduced Instruction set, the size of each instruction is either 2 bytes or 4 bytes. But, CISC comes with set of instructions whose size can vary to a great extent. They can have an instruction of 1 byte, 2 bytes and 3 bytes as well.
2. Almost 90% of instructions are executed in a single clock cycle in contrast to CISC. The remaining 10% of instructions utilises two clock cycles and can be done in a single clock cycle with proper code scheduling.
3. RISC architecture contains a large number of GPIO registers which is of great use and is also used to stack large data.
4. RISC architecture uses separate set of buses for code and data. But in CISC we have only address bus to carry the address of the memory location which is unidirectional and another bus to carry both data and code which contains opcodes and operands.

It is therefore no wonder why RISC is used in a variety of controllers these days!

By
Sampath Kumar
II Year C

INDUSTRY INSIGHT

It is a well known fact that an Engineering degree is no walk in the park. It expects hard work and commitment from every student. More often than not, keeping up with the course work alone is not sufficient to provide one the necessary credentials to call himself an engineer. It is extremely important to keep with the times to learn about the latest advancements in the world. One way to do this is by exposing yourself to new arenas.

Interning at industries enhances learning and gives exposure. It also doubles up as a great resume booster. We managed to catch up with two students who interned at reputed industries this summer.

Salcomp

Salcomp Manufacturing Company Ltd. is a company that manufactures adapters and printed circuit boards (PCB) for mobile phones and other electronic devices. Their main customers include major smartphone and tablet manufacturers like Xiaomi, Samsung and Microsoft. They also deliver power adapters for notebooks, gateways, routers, set-top-boxes, lightings and also for other electronic applications. This summer vacation, Mridhula Ramesh from III year, ECE A, attended a two week In-plant training at Salcomp, Sriperumbudur. We caught up with her to hear about her experience.

" Since it was my first time working in an industry, I was thrilled and was eagerly looking forward to it. In an introductory session, I was given an insight about the company's vision, their values and the products they manufacture followed by an in-depth review of the process flow of manufacturing a charger and PCB. I spent the next two weeks in the production line gaining invaluable experience. I learnt a lot, starting from the care and precision that has to be taken while handling the PCBs, the machines and sensors that is used and their functions. I was introduced to the the MPI (Manufacturing process instruction) followed at each stage and given a brief on the effective ways to increase productivity, reduce cycle time and eliminate wastes and the various quality check methods which includes aging, functional test, drop test and balance voltage test among many others."

Salcomp provides a scope for continuous learning (KAIZEN) to its workers by giving them an opportunity to come up with ideas that helps in its development. It also conducts several SGAs (Small group activities) to improve production quality and reduce down time. Mridhula strongly feels Salcomp is a great place to learn and explore. "Even though I spent only two weeks at the company I acquired a great deal of knowledge. It was indeed an amazing experience.", she says. She is looking forward to using the ideas and the information gained during the training in her projects and is also interested to work in the same line in the near future.

Mridhula Ramesh , III Year, A

QUBE

Sandeep Kumar from III year ECE B interned for four months at Qube Cinema.

Qube Cinema is an Indian corporation that manufactures digital cinema servers, integrated media blocks (IMBs) and Digital Cinema Package (DCP) creation software. With the transformation of the majority of theatres from film-based to digital cinema, Qube is one of the companies that provide servers and IMBs to commercial and institutional theatres.

Qube Cinema was the first to demonstrate that a 4K 3D digital cinema could be streamed from a single server to multiple synchronized projectors. Qube's servers are currently used in Giant Screen theatres that have made the switch from 70 mm film to digital 3D. Their digital cinema mastering products convert still images, Flash animations, and QuickTime movies into a Digital Cinema Package that can then be streamed through a server and into a projector. Qube Cinema currently has digital cinema equipment over 3763 theatres as of 2017.

Sandeep claims that the four months at Qube were filled with invaluable learnings and great memories. This is what he had to say about his experience :

"I interned at Qube for 4 months and my experience was wonderful. Not only did I learn a lot but also had an equal amount of fun. Such is the work culture at Qube. It is one of the companies which stresses on maintaining a work-life balance. Unlike other big companies, the management at Qube is at its finest. On our first day, our system machines were ready. We were assigned our respective mentors and managers and by evening we knew exactly what work we had to do. This kind of management prevents a stressful work life where you don't know what to do initially and suddenly near the end you are dumped with workload.The interns at Qube are encouraged to attend the team meetings along with other full time employees even if their project is not concerned with the meeting. This develops professional attitude towards work. Sitting in the conference room and listening to other ideas, challenges faced and solutions is quite an experience."

The company does not follow a typical corporate work style. There is no formal dress code. There are also flexible timings of work. Interns are given office-only work. While work occupies their mornings, the evenings are all about having fun. There are even indoor and outdoor game facilities to relax.

"Through the course of my internship I learnt new technologies that I was previously unfamiliar with. In a span of 4 months I completed 3 projects, learned and implemented exciting new technologies using Golang. Even though my stint at Qube was for just 4 months, the learning and the memories made are immeasurable. I am truly proud to be part of Qube."

WASSUP?

You have come this far! You have taken a look at the impressive achievements of our faculty members and students. It's now your turn. Want to explore opportunities that tap your talent? Think you can ace them with your intellect and bring laurels to the college? Look no further. Here is a list of some of the conferences and events you can attend in the coming few months.

1) **Event:** International Conference on Artificial Intelligence,Smart Grid And Smart City Applications(AISGSC)

Venue: PSG College Of Technology, Coimbatore

Date: 04th Jan-5th Jan, 2019

Event type: Conference

2) **Event**: IEEE Collegiate Circuits Design Contest C2DC 2019

Venue: Mahendra Engineering College Namakkal

Date: 09th Jan, 2019

Event type: Hardware Project Design Contest

3)**Event**: Indian Rover Challenge

Venue: Manipal Institute of Technology, Karnataka.

Date: 09th Jan-12th Jan, 2019

Event Type: Design

4)**Event**: Saarang

Venue:Indian Institute of Technology, Madras.

Date: 9th-13th January, 2019

Event Type: Techno Management Fest

5)**Event:** ITrix 19

Venue: College Of Engineering,Guindy

Date: 24th Jan-26th Jan,2019

Event Type: Information Technology Symposium

6) **Event:** E-Fest Asia Pacific 2019

Venue: VIT, Vellore

Date: 01st Feb-3rd Feb, 2019

Event type: Technical Fest

7) **Event**: Breeze 19

Venue : Shiv Nadar University, Uttar Pradesh

Date:08th to 10th Feb, 2019

Event type: Techno Cultural And Sports Fest

8)**Event**: Kurukshetra

Venue: College Of Engineering, Guindy.

Date: Feb 13th-16th, 2019

Event Type: Techno Management Fest

9)**Event:** ÉCLATECS 2K19

Venue: JNTUA College Of Engineering, Kalikiri (Andhra Pradesh)

Date:20th-21st Feb,2019

Event Type: ECE Symposium

10) **Event:** International Conference on Frontiers in Smart System Technologies

Venue: Vel Tech, Chennai

Date: 26th to 28th Feb, 2019

Event Type: Conference

11) **Event**: Interface 2019

Venue: Birla Institute of Technolgy and Sciences, Pilani

Date: 01st-03rd March, 2019

Event type: Management Fest

12) **Event**:International Conference on Energy Power Integrated Circuits and Systems

Venue: Bannari Amman Institute of Technology, Erode

Date: 06th -08th March, 2019

Event Type: International Conference

13)**Event**: International Conference on innovations in Electrical, information and Communication Engineering ICIEICE 19

Venue: Kongunadu College of Engineering and Technology, Trichy

Date: 25th-26th March, 2019

Event Type: International Conference

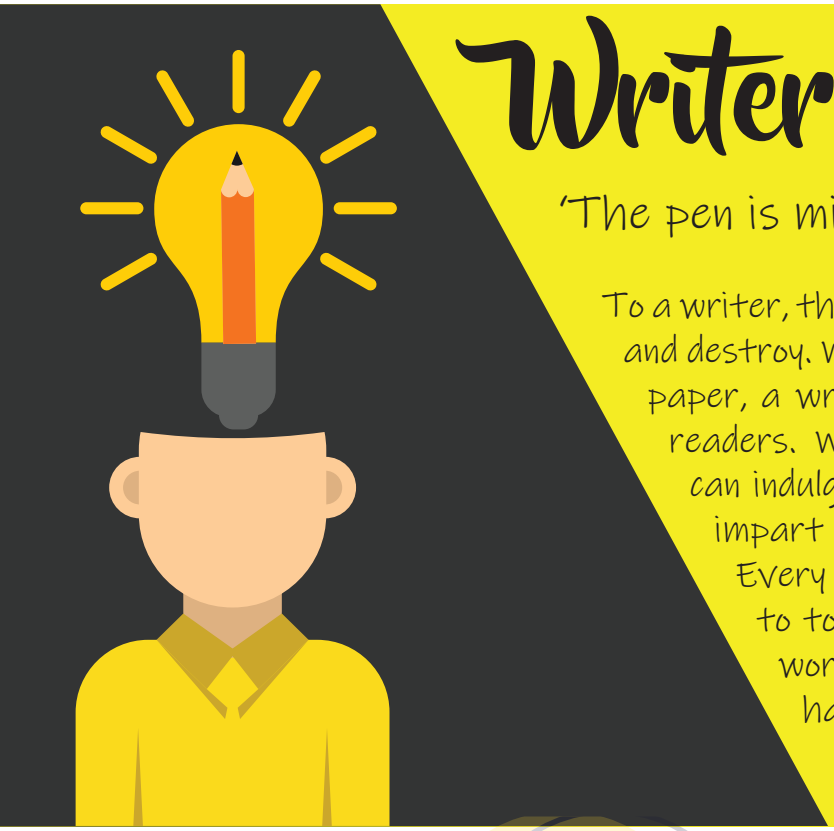
14) **Event**: Sandhaan 19

Venue: BIT SINDRI, Jharkhand

Date: 10th-12th April, 2019

Event Type: Techno Management Fest

-Aaditya S
II year A



Writer's Enclave

'The pen is mightier than a sword'.

To a writer, the pen is the greatest weapon that can invent and destroy. With a simple stroke across the smooth white paper, a writer weaves magic and casts a spell on the readers. Writing is an art form that almost anyone can indulge in. Fundamentally, to write is to share, to impart knowledge and wisdom to those looking for it. Every written record, from archaic wall paintings to today's digital blogs has a unique place in this world. Whether it is on politics, war or mundane happenings of everyday life, it creates history.

Welcome to the Writer's Enclave!

DREAM BIG

"All of life is peaks and valleys. Don't let the peaks get too high and the valleys too low."

- John Wooden

Without the ups and downs, life just wouldn't be the same. It's this unpredictability which adds the much needed flavour to our life. We need to find the push to get to our destination. Finding this push is not difficult; it is something we are inherently capable of. But when life throws problems at us, we get stuck not knowing how to move ahead. The primary purpose of me writing this article is to help you find this push to achieve your goals. In that regard, I would like to share some inspirational anecdotes that I came across.

I. POSITIVE ATTITUDE

Never look at any situation as a problem. View it as an opportunity and strive to do well. Here is an interesting story about 'Two Shoe Salesmen'

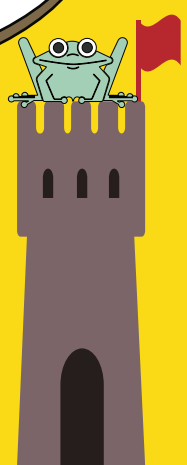
"Two salesmen were sent by a shoe company to Africa to gauge the market potential for shoes in Africa. After spending a few days in Africa , the first salesman concluded that there was no market there - nobody wore shoes. On the contrary, the second salesman claimed there was a huge market potential – nobody wore shoes."

The first salesman considered only the negative aspects of the issue whereas the second salesman focussed on the positives. Situations will often force us to be like the first salesman. We must, instead, have a 'never say die' attitude and strive hard to be like the second salesman. Looking at the world through a 'positivity' lens will stand us in good stead.

II. LEARN TO CONTINUE EVEN WHEN THE WORLD SAYS "NO"

The world will say, "No" in a thousand different ways. Each "No" that we listen to, will demotivate us and we might even feel like quitting sometimes. However, it is imperative that we show the world that "Yes. Yes, I can". The story of a frog that did not listen to other frogs who said 'No' is not unfamiliar to us.

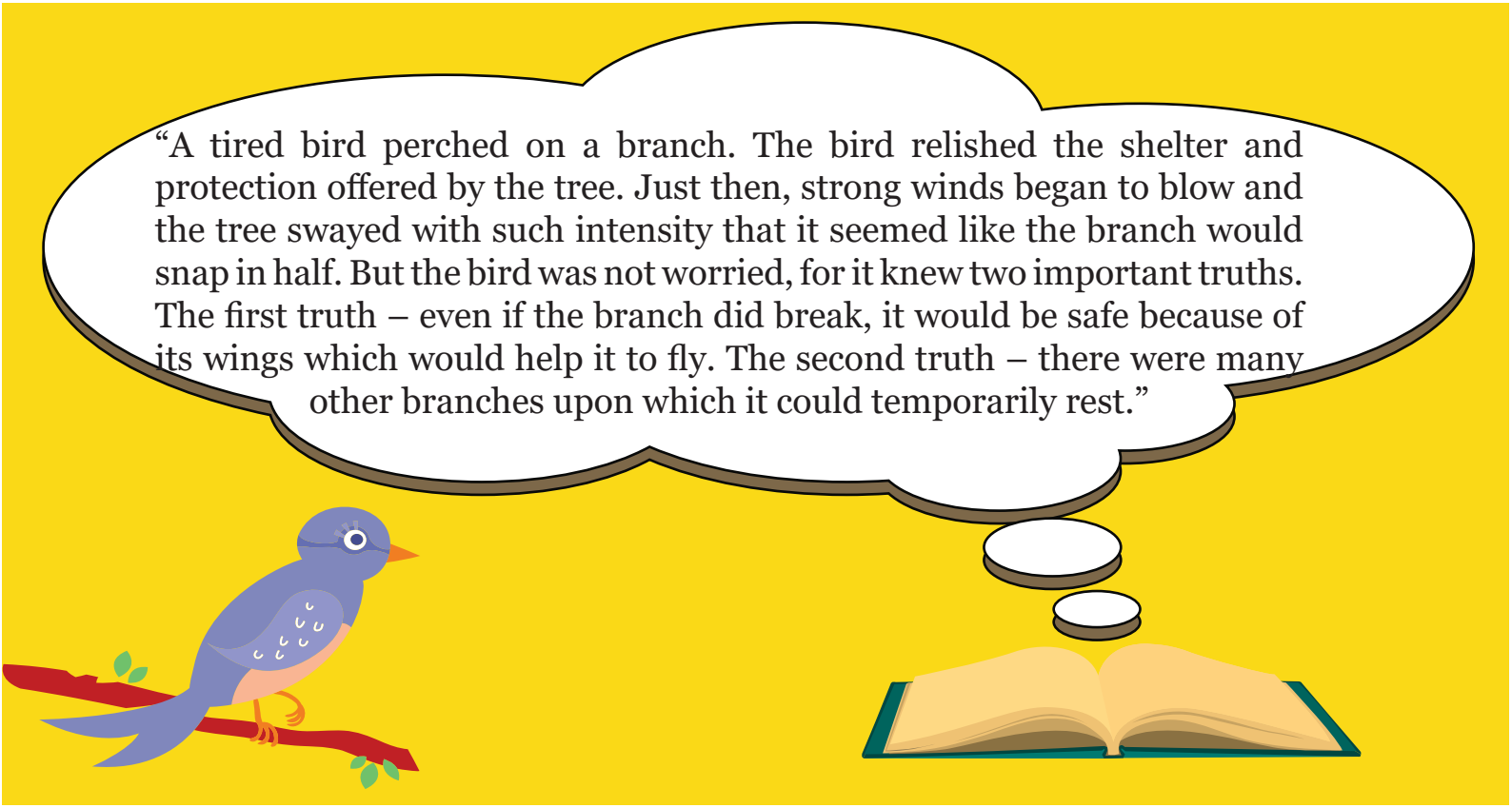
"The frogs had a contest to climb a tower. As soon as the contest began, all the frogs exclaimed, "It is very difficult", "The tower is too high for a frog to climb". Listening to this, most of the frogs gave up and fell down. However, one frog continued to climb and reached the top. All were astounded and were eager to learn how this frog managed to perform this seemingly impossible feat. Turns out the frog was deaf."



Sometimes, we have to be deaf to other people's opinions on what we can or cannot achieve. We should not be bound by the limits they set for us. Always believe in yourself and say "Yes, I can" and success will be yours. Take my word.

III. SELF CONFIDENCE

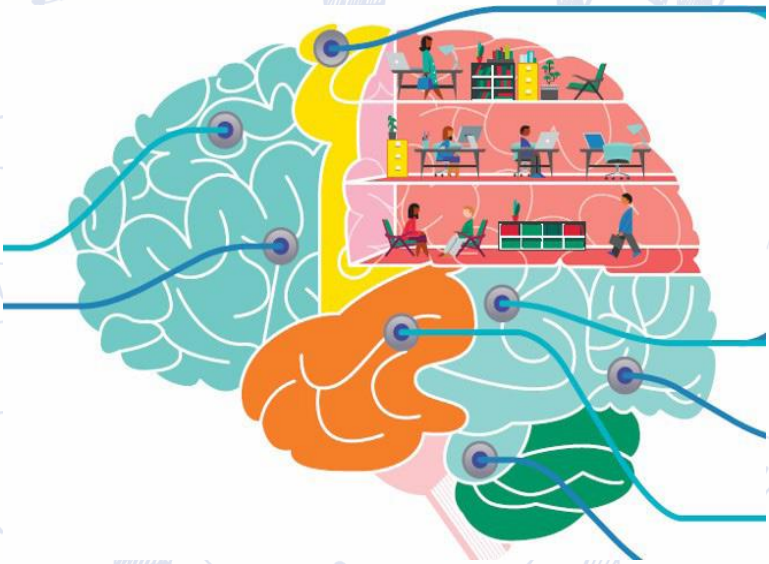
We must have noticed that when we are confident, we can easily tackle any problem that may arise. This stems from the fact that what we believe about ourselves in the inside, manifests on the outside. So it is essential that we believe in our skills and abilities as courage follows self-confidence.
I would like to share with you guys a small story about self-confidence.



From this story we can see that in the forests of our lives there are many so-called branches and trees that we rely on. We need to realise that they may not be available at all times. What is truly lasting and permanent lies within us, in the form of positivity, self-esteem and strong belief in our own abilities.
I hope this article was a source of inspiration for you. As cliche as it may sound, Carpe Diem!

Nikhilesh. N
IV year B

SEE YOUR DREAMS - THE CEO WAY



Most of us feel hopeless and inadequate about our lives. We constantly compare, judge and put ourselves down. It is easy to get overwhelmed when we look at our peers and seniors who are so far ahead that it seems almost impossible to catch up with them. Googling is of no help, as it is either a bunch of people judging you or some moron asking you to join a Zumba class (based on a true story). So, distracting ourselves from this inner turmoil seems like the most logical thing to do at this point, because "nothing I do matters anyway", right?

Inspiration can be momentary and fleeting, and it does not help in sustaining your goals. The best you can do for yourself is taking control back from all the external factors that you love to blame, and hold yourself accountable for your actions.

I like to gamify situations to make the whole daily grind seem more fun. It's handy to have a system in place when you're feeling overwhelmed, instead of wallowing in a pool of guilt and despair.
Since the entrepreneurial mindset is all the rage now, here is my strategy for effective, long-term development.

1 Think of yourself as the CEO of the most important company to you – yourself. You are in charge of all the decisions and in control of all the resources. You oversee every department in your company.

2 Divide the areas you want to work on into separate departments. This can be personal development, work-related or even health-related. Start with two or three, and expand as your company earns more. For example, your robotics project can fall in the Department of Artificial Intelligence. Make it fun!

3 List out the tasks that fall under every department. Also, list out the bad habits that you want to limit.

4 Assign a price to every activity. Productive tasks earn you money, and your bad habits lose them. Completing a week on Coursera can earn you Rs. 100, but an hour of entertainment will cost you 250. You can even think of entertainment as a luxury item you can buy with your earnings.

5 Time is your company's most important resource. The goal of your company is to maximize earnings in the 16 hours of awake time you get every day without losing your sanity. (Tip: If sleeping is your weakness, you can earn while you sleep)

6 You can also add meditation, a hobby, or something that helps you relax (not TV) as bonus treats for every 1000 rupees you make.

7 Finally, log your activities and see how much money you actually make.

And you're all set. Feel free to improvise and tweak it to your liking. Set a weekly or monthly target and you can invest in a new department once you hit them. Pursue greater goals as your budget expands. Who knows, you might even learn a thing or two about running a real company along the way!

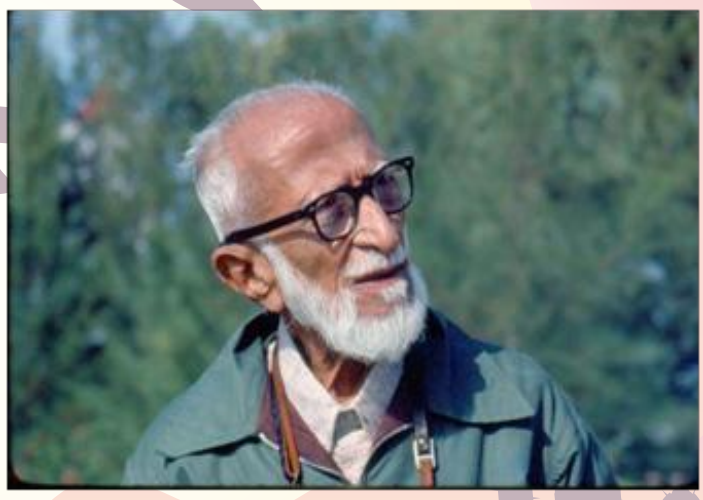
By
Varshini Kannan
III year B

The Real Pakshi Rajan

> IT'S BEST TO HAVE FAILURE HAPPEN EARLY IN LIFE. IT WAKES UP THE PHOENIX BIRD IN YOU SO YOU RISE FROM THE ASHES
>
> ***Anne Baxter***

INTRODUCTION

The promotion for 2.0, starring Rajinikanth and Akshay Kumar in the lead roles was on a whole other level - huge hot air balloon over Hollywood, poster projected on Burj Khalifa, and numerous billboards and hoardings all over the world (phew). The excitement surrounding the movie in the months leading to its release was palpable. Even though the budget for the film raised a few eyebrows, the film was well received for the outstanding visual effects and the message it conveyed.



Although Akshay Kumar played the antagonist, his character won many hearts. On watching the film one might wonder if a person who loves and worships birds as much as Pakshi Rajan did in the movie ever existed in real life. The answer is yes. He is none other than the Indian ornithologist **'Salim Ali'**, also called as the Birdman of India.

Salim Ali was born on 12th November, 1896 in Bombay, British India and was the 9th and the last child. His parents died when he was young and was raised by his maternal uncle. He was one of the first scientists to carry out bird surveys in India and abroad. He spent his life carrying out research on birds and contributed immensely to the protection of nature. He was awarded the Padma Bhushan in 1958 and the Padma Vibhushan in 1976, India's third and second highest civilian honours respectively. Several species of birds, a couple of bird sanctuaries and institutions have been named after him.

Author's note:

While yours truly watched the movie at Sathyam on the second day munching popcorn with all the flavours blended together to form the perfect tangy taste, he wondered what would happen if the world was deprived of mobile phones like it happened in the celluloid. The chained world would be liberated from the clutches of Android or Apple. Oh man, the 200 day Snapchat streak would be gone once and for all!

Aaditya. S
II year A

Impulse

VOLUME 7 ISSUE 2