The Department of
Electronics and Communication Engineering

PRESENTS

Impulse

Volume 9 Issue 1

Half-yearly Newsletter

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EDITOR'S NOTE

Hello Readers,

On the behalf of the Department of ECE, we are proud to present the 9th edition of the IMPULSE magazine!

For many of us, each new year marks a chance for renewal and 2020 is no exception. Every article in this issue advocates challenge, opportunity, and the transformative power of hope. The experience of being editors of this stellar magazine has been an extremely exhilarating one, as we have learnt so much in this journey and met many inspiring people, learning about all the fascinating things that they have done in their lives. All of whom had a clear vision and strived to make those dreams come true, thus bringing them to where they are now. It was quite motivating to experience.

The magazine brings out the achievements of our students, staff and alumni in curricular, co-curricular and extra-curricular spheres. This magazine is also a repository of information and knowledge, providing a forum for open exchange of ideas. We would like to express our gratitude to the faculty in-charge, who has been an integral part of the magazine, by guiding us every step of the way. Each and every memeber of our fantastic team has worked really hard to make all this happen and so a big thank you to Team Impulse for their dedication and arduous work to ensure that this magazine is a success!

We'd like to end this note with a few inspiring words of Swami Vivekananda.

"Arise, awake and stop not till the goal is reached."

Hyadarani Jayadharan
Shivani Devi G

MEET THE TEAM

FACULTY CO-ORDINATORS :

1. Dr. S. Radha
   Prof. & HOD, ECE
2. Dr. K.T. Selvan
   Professor, ECE

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   Associate Professor, ECE

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CONTENTS

INVITED ARTICLE

Dr. A Jawahar,
B.E., M.S., M.Tech., Ph.D.
Professor

Role of Optical Networking in High Speed Communication

Wireless communication is becoming an integral part of today's society. The spread of mobile and other wireless devices with increased demand for broadband services is exerting a pressure on wireless systems to increase their capacity. To achieve this, wireless systems must have increased feeder network capacity, to operate at higher carrier frequencies, and cope with increased user population densities. However, raising the carrier frequency and thus reducing the radio cell size leads to costly radio systems while the high installation and maintenance costs associated with high bandwidth silica fiber render it economically impractical for in-home and office environments [1].

The focus is on an Optical network which supports Orthogonal Division Frequency Multiplexing (OFDM) supporting Radio Over Fiber (ROF) applied in optical systems. Hence by incorporating OFDM along with the optical fiber, the ROF based systems can be used for applications involving short distances and also long-haul transmission at a very high data rate. This improves the system flexibility and provides a very large coverage area without increasing the cost and complexity of the system much.

ROF is a technology which is used to distribute Radio Frequency (RF) signals over analog optical links. In such ROF systems, broadband microwave data signals are modulated onto an optical carrier at a Central Station (CS), and then transported to remote sites or Base Station (BS) using optical fibers. The base-stations then transmit the RF signals over small areas using microwave antennas. With the increasing popularity of internet-based services, fiber-optic access is presently regarded as the only technology with the potential to cope with the expected bit rate demand for home connections. For these reasons, the next generation optical networks are expected to require more advanced modulation formats, such as OFDM modulation.

Nowadays the digital processing technology has matured to the point where OFDM signal processing could be performed in a Complementary Metal-Oxide Semiconductor (CMOS) integrated circuit which can digitize the information at the high bit rates typical of fiber optic communication systems. OFDM has already been established in long haul high bit data rate fiber applications as a technique to compensate the chromatic dispersion of a Standard Single Mode Fiber (SSMF).

Passive optical network (PON)

Passive optical network (PON) is a technology that modulates the light wave from the Optical Line Terminal (OLT). The OLT is a unit, which is generally placed at the premises of the Central Office (CO) and transmits it through fibers to Optical Network Units (ONUs) that are located at the end user, and are designed to provide virtually unlimited bandwidth to the subscriber [2]. We can describe the system as a Fiber-To-The-Curb (FTTC), Fiber-To-The Building (FTTB), or Fiber-To-The-Home (FTTH). These configurations work as Point to Multipoint (PMP) topology and use a single optical

fiber to serve multiple premises usually between 32 and 128. A passive Optical network is a single, shared optical fiber that uses a passive optical splitter to divide the signal towards individual subscribers as shown in Figure 1.

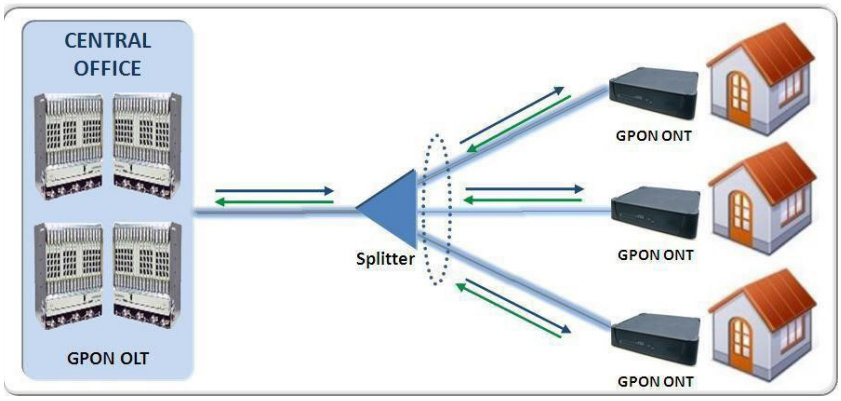


Figure 1: Typical optical fiber network components [2]

Any PON system can be shown in a simple block diagram structure as shown in Figure 2 which consists of three main parts. An Optical Line Terminal (OLT) at the central office, Remote Node (RN) such as a passive splitter or Array Waveguide Grating (AWG) in the channel and an Optical Network Unit (ONU) at the end user.

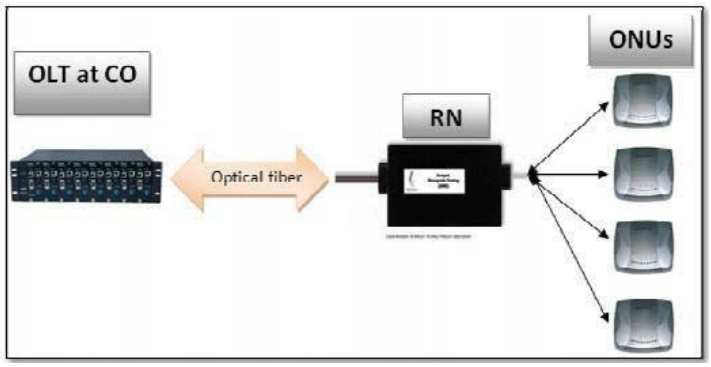


Figure 2: PON structure [2]

There are several PON standards [3] like Asynchronous Transfer mode Passive Optical Network (APON), Broadband Passive Optical Network (BPON), Ethernet PON (EPON) and 10G-EPON each of these standards offer a variety of data rates in downstream and upstream transmission and the distance between OLT and ONU are given in table 1. [4]

Table 1: Common PON standards

Technology	*Standard*	*Distance (Km)*	*Splitting ratio (max)*	*Downstream (Mbps)*	*Upstream (Mbps)*
BPON	*.983*	*0*	*:32*	*155, 622, 1244*	*155, 622*
EPON	*02.3*	*0*	*:64*	*1244*	*1244*
GPON	*.984*	*0*	*:32*	*1244, 2488*	*155 to 2488*

Time Division Multiplexing-Passive Optical Network (TDM-PON)

Time Division Multiplexing-Passive Optical Network (TDM-PON) shown in figure 3, is a point-to-multipoint (PMP), FTTx (e.g., FTTH, FTTP, FTTC, etc.) network construction. An OLT is connected with many ONUs via a remote node [5], which usually contains one or several optical power splitters. Most of the commercial PONs today, e.g., BPON, EPON, and GPON, are TDM-PONs.

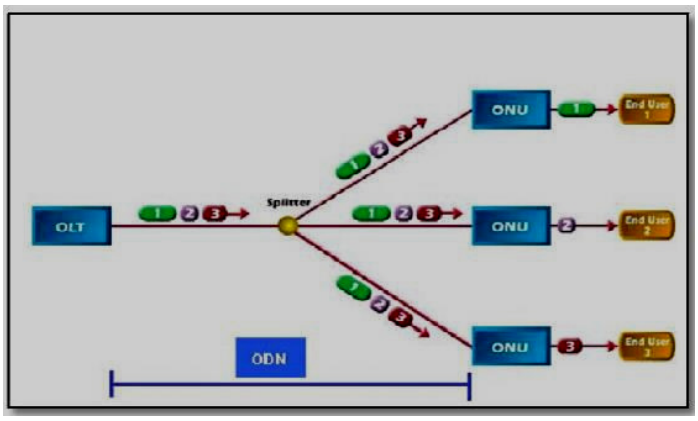


Figure 3: Typical architecture of a TDM-PON [5]

Although TDM-PON provides a higher bandwidth than conventional access networks, it may not be able to fulfil the requirements of the future network with respect to the continuously growing demand for bandwidth. Furthermore, the use of an optical power splitter leads to security issues and significant power losses. For instance, a 1:32 optical splitter imposes more than 17 dB insertion loss.

Wavelength Division Multiplexing - Passive Optical Network (WDM-PON)

In the future a solution to the various problems caused to the signals such as bandwidth, security, power loss, etc., can be solved using Wavelength Division Multiplexing – Passive Optical Network (WDM-PON). A typical WDM-PON system based on wavelength splitting uses a passive wavelength demultiplexer, such as an Arrayed Waveguide Grating (AWG) as shown in Figure 4, which is the remote node. Signals are coded on various wavelength channels, and then routed to different ONUs by the demultiplexer.

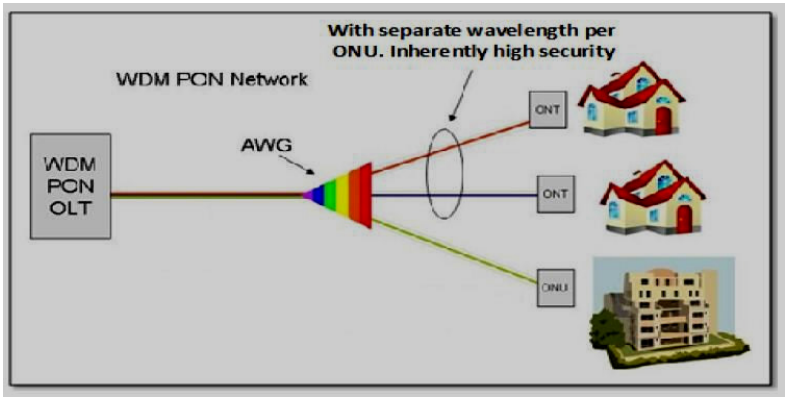


Figure 4: A typical architecture of WDM – PON [5]

The use of a demultiplexer avoids the large insertion loss introduced by an optical splitter, which greatly improves the power budget of the whole system. This approach also creates a point-to point (PP) link where a dedicated wavelength channel is reserved between the OLT and each ONU. Thus, each ONU can operate at the full bit rate of its own wavelength channel. Moreover, since each ONU only receives its own signals, this point-to-point logical architecture brings in much more privacy and higher security than the TDM-PON technology. Another type of WDM-PON which is referred to as the power-splitting approach still uses the optical splitter at the remote node, where the data signals

with different wavelengths are broadcasted to each ONU. Then, the optical filters positioned right before the transceivers at the ONUs help to select and transmit only one wavelength channel and block all the others. This kind of WDM-PON can be upgraded easily from the existing TDM-PON architecture without any change in the optical distribution network(ODN), but it cannot mitigate the problems of low security and high-power loss.

Research Directions

Major challenges with the optical simulation tools are that they have to perform well for the wider optical bandwidth of tens of THz while incorporating the slow dynamics of amplifiers. In order to overcome this limitation, hybrid network may be designed. The possible suggestions in the future could be as follows,

- The concept of Electrical Code Division Multiplexing (ECDM) can be used along with OFDM for the next generation optical networks. The main advantage of using the ECDM is that an error free two bidirectional PON channels can be demonstrated.

- The future optical network traffic will be a type of elastic optical networks, which realize flexible bandwidth allocation according to diverse traffic needs and requirements. Such an elastic network can be proposed by using the bandwidth allocation properties of OFDM-WDM-PON. A novel improved dynamic bandwidth allocation algorithm for efficiently reducing the blocking rate and bandwidth fragmentation can be implemented for both uplink and downlinks.

- A new hybrid backhaul architecture based on WDM-PON and Millimeter wave communications to deliver OFDM signals in heterogeneous wireless networks can be developed. This kind of architecture will have the combined advantages of optical fiber and also wireless communication techniques to provide high capacity connections and also provide the element of flexibility for long reach connections. The feasibility of such a network depends on the BER parameters of optical fiber.

References

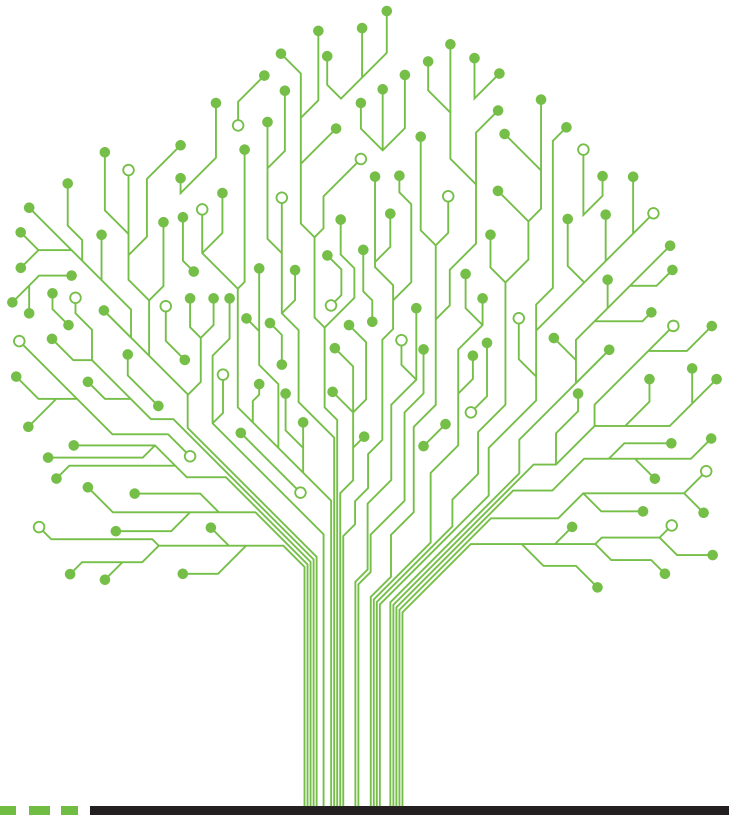
1. *Bryn J Dixon, Roger D Pollard & Stavros Iezekiel 2001, 'Orthogonal frequency division multiplexing in wireless communication systems with multimode fiber feeds', IEEE Trans Microwave Theory Techniques 2001, vol. 49.*

2. *Navid Ghazisaidi , Michael Scheutzow & Martin Maier 2014, 'Survivability Analysis of Next -Generation Passive Optical Networks and Fiber Wireless Access Networks', IEEE Transactions on Reliability, vol.60 , issue 2, pp.479 – 492.*

3. *Yoshimoto, N 2010, 'The role of advanced EPON systems and their related technologies for sustainable growth of telecom industry', Asia Commun. Photon. Conf., Shanghai, China.*

4. *Yu Zheng, Zijian Mao, Lingyun Di, Zhiqun Ge, Xiaolu Zhang , & Xiaohan Sun 2017, 'Low latency passive optical node for optical access network', International Conference on Optical Communications and Networks (ICOCN), pp. 1-2.*

5. *Carlos Bock, Josep Prat & Stuart D Walker 2017, 'Optical Next-Generation Access Networks Featuring Combined WDM and TDM', International Conference on Transparent Optical Networks, vol.1, pp.270-275.*



VISITS & INTERACTIONS

1. Dr. S. Radha, Prof. & Head, visited an industry at Bangalore on 5th Dec. 2019 for the development of hardware for the ongoing DST SSTP sponsored project.

2. The UWARL team, headed by Dr. S. Sakthivel Murugan, Asso. Prof., had discussion with Mr. Vandit Bhurat, Marketing Manager, Honeywell technology Pvt. Ltd. and Mr. R. Satish, Arobotics at UWARL, SSNCE on 11th Dec. 2019.

3. Dr. S. Radha, Prof & Head, Dr. R. Hemalatha, Asso. Prof., Dr. S. Aasha Nandhini, JRF had Skype discussion with Dr. Raj Dave, Mr. Krishna Shastri, Mr. Gaurav Sagarwal, Dr. Astha Agarwal, Mr. Abrahem Stephen, Mr. Satya Pogaru, Dave Law Group, USA, about the patentability search report on Agriculture project on 6th Jan. 2020.

4. Dr. S. Sakthivel Murugan, Asso. Prof. and his ROV team members had a meeting with Mr. Vandit from Honeywell regarding IMU on 7th Feb. 2020.

5. Dr. N. Edna Elizabeth, Prof. along with 20 final year UG students and Nandhini.A ME-VLSI visited Society for Electronic Transaction and Security, Taramani, Chennai. Ms. A. Suganya discussed and demonstrated hardware security and software security systems with the students on 14th Feb. 2020.

6. Dr. S. Sakthivel Murugan (ECE), Asso., Prof., Dr. K.Murugesan (EEE), Asso. Prof., Dr. K. Muthumeenakshi (ECE), Asso. Prof., Dr. N.Padmapriya (Maths), Asso. Prof., and students working in Underwater Acoustic Research Lab (UWARL) interacted with Prof. Ian F. Akyildiz, Distinguished visiting faculty, SSNCE and presented their research work related to Underground and Underwater Communication on 10th Mar. 2020.

7. Dr. S. Radha, Prof. & Head, Dr. R. Kishore, Asso. Prof., Dr. K. Muthumeenakshi, Asso. Prof., Dr. R. Hemalatha, Asso. Prof. & Dr. S. Aasha Nandhini, RA interacted with Prof. Ian F. Akyildiz, Distinguished visiting faculty, SSNCE and presented their research work related to the disease detection in banana plants on 11th Mar. 2020.

8. Dr. S. Radha, Prof. & Head, Dr. R. Kishore, Asso. Prof., Dr. R. Hemalatha, Asso. Prof. and Dr. S. Aasha Nandhini, RA had Skype discussion with Prof. Ian F. Akyildiz, Georgia Tech, Dr. Rui Dai, Asst. Prof. at the University of Cincinnati and Pu Wang, Asst. Prof. at the University of North Carolina, Charlotte on 17th Mar. 2020. The discussion was about optimizing the placement of WMSN sensors in agricultural fields and exploring the possibility of applying for a patent.

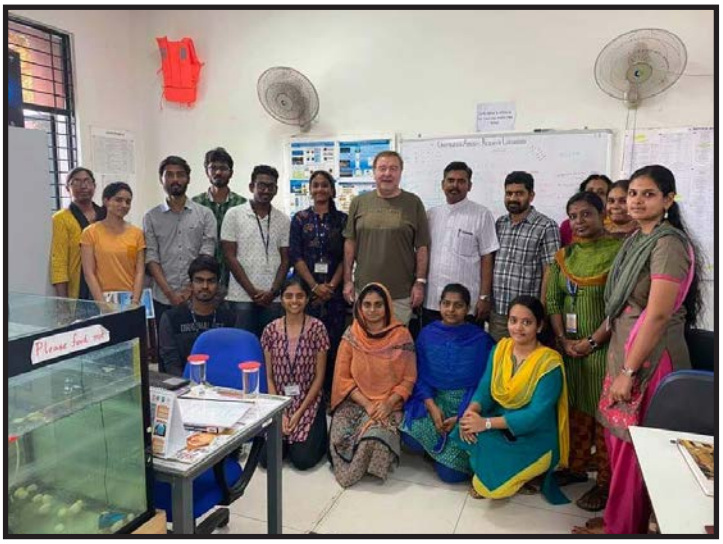
9. Dr. S. Radha, Prof. & Head and Dr. B. S. Sreeja, Asso. Prof. discussed the project "Development of cost effective Wearable Semi-Automatic Insulin Delivery System" with Prof. Ian F. Akyildiz, Distinguished visiting faculty, SSNCE.

10. Dr. S. Radha, Prof. & Head and Dr. S. Kiruba Veni, Asso. Prof. discussed the research work " Multifunctional Sensor for the Detection of Toxic Gases (Methane and Carbon Monoxide) and Leakages in the Sewage System" with Prof. Ian F. Akyildiz, Distinguished visiting faculty, SSNCE.

11. Dr. S. Radha, Prof. & Head had interaction with Prof. Ganesh Samudra, Distinguished Visiting Prof./EEE, SSNCE for course file description of R2018. Following the discussion, a comprehensive user guide was prepared for the course file description by Prof. Ganesh Samudra and modified based on the suggestion given by Dr. S. Radha, Prof. and shared with the faculty members of ECE for preparing their course file.

12. Dr. S. Sakthivel Murugan, Dr. K. Murugesan, Dr. K. Muthumeenakshi, Dr. N. Padmapriya, Asso. Prof(s) and the students working in Underwater Acoustic Research Lab interacted through zoom with Dr. Ian Ayklidiaz, Professor, Georgia Tech, USA on "Hybrid ROV and MI in Underground and Underwater Localization, Image Mapping Research methodology etc." on 13th May 2020.

13. Dr. K. T. Selvan, Prof. attended an online meeting with a Tata Elxsi team to renew the MoU between the two institutions on 28th May 2020.



UWARL Team with Prof. Ian F. Akyildiz, Distinguished visiting faculty, SSNCE.

EXPERT LECTURES

Faculty Talks Elsewhere

01 Dr. S. Radha, Prof & Head delivered a lecture on "Wireless Sensor Node Architecture & its MAC Protocols" in the FDP sponsored by AU and organized by University College of Engineering, Kancheepuram on 6th Dec. 2019.

02 Dr. B. S. Sreeja, Asso. Prof. delivered a lecture on "THz science, technology and applications" in the two-day Symposium held at B. S. Abdur Rahman Crescent Institute of Science and Technology, Chennai on 20th Dec. 2019.

03 On 2nd Jan. 2020, Dr. K. T. Selvan, Prof. delivered a talk on "Teaching and learning electromagnetics in 2020" at BITS Hyderabad. He also assessed some doctoral student posters on the same day.

04 Dr. C. Annadurai, Asso. Prof. delivered a lecture on the topic "Advanced Microprocessor and Microcontroller" at Muthayammal Engineering College, Rasipuram on 25th Jan. 2020.

05 Dr. K. Muthumeenakshi, Asso. Prof. delivered a talk entitled "An Introduction to Naive Bayes Classification for Machine Learning" for the 2-Week online refresher course on "Recent Trends in Information, Computing, Communication and Teaching Methodology Competency" conducted by Sri Sairam Engineering College, Chennai on 11th May 2020

06 Dr. N. Edna Elizabeth, Prof. delivered a Webinar talk on "Study of Cryptography, Network Security and Implementation of Algorithms in Hardware for Lightweight Applications" organized by Department of ECE, SVCE, Chennai on 14th May 2020.

07 Dr. P. Vijayalakshmi, Prof. delivered a talk titled "Role of machine learning techniques in speech technologies" in a 5-day FDP on "Machine learning for signal processing" organized virtually by Department of ECE, SVCE, Sriperumbudur on 19th May 2020.

08 Dr. R. Amutha Prof. delivered a talk on "Equalisation – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms" during the Anna University sponsored FDTP organised by Department of ECE, SVCE, Sriperumbudur on 5th Dec 2019

09 Dr. N. Venkateswaran delivered a talk on, "Spread spectrum and Rake Receiver" during the Anna University sponsored FDTP organised by Department of ECE, SVCE, Sriperumbudur on 5th Dec 2019

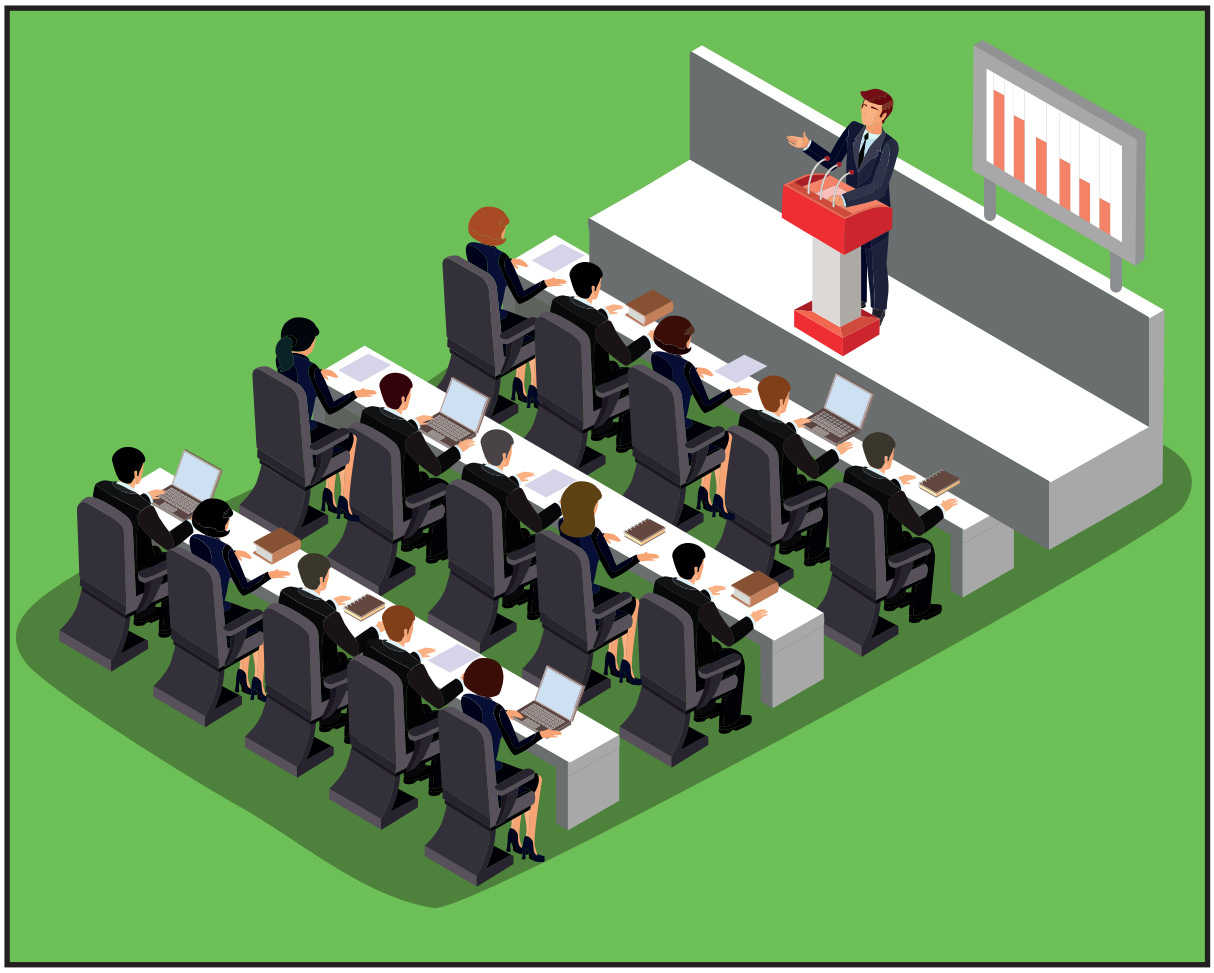
Prof. K T Selvan, while delivering a talk at BITS Hyderabad.

Talks at the Department

01 Dr. Ian F. Akyildiz, Ken Byers Chair Professor, School of Electrical and Computer Engineering, Georgia Institute of Technology & Distinguished Visiting Faculty, SSNCE offered one credit course on “Wireless Networks” to the UG and PG students of the department. Dr. S. Radha, Prof & Head, Dr. R. Kishore, Asso. Prof. and Dr. N. Prabagarane, Asso. Prof. coordinated the programme.

02 Mr. M. Chinnathambi, Technical Lead, VIASAT, Chennai “LTE: Standard for Next Generation Wireless Networks” on 18th Jan. 2020.

03 Mr. John Kingsly, Director- Strategic Insights & Business Development, Proadpt, Chennai, “5G Network will revolutionize the world” on 10th Mar. 2020.



EVENTS ORGANISED

1. Three-day STTP on "Antenna Design and Measurement Techniques"

Date: 5th Dec. – 7th Dec. 2019

Coordinator: Dr. M. Gulam Nabi Alsath & Dr. S. Ramprabhu, Asso. Prof(s).

Speakers: Dr. A. K. Shrivastav, Former Program Director/SAMEER & Prof./Saveetha Engineering College; Dr. K. T. Selvan, Prof., ; Dr. M. Gulam Nabi Alsath, Dr. S. Esther Florence, Dr. S. Ramprabhu, Asso. Prof(s);The research scholars Mr. B. Ashvanth, Ms. P. Devi Sowjanya, Ms. N. Kavitha & the JRF Ms. Vidhyashree coordinated the hands-on session.

Sponsor: SSN trust

Participants: 18 participants including the faculty and students from various engineering colleges.

2. Three-day workshop on "VLSI Design"

Date: 12th Dec. – 14th Dec. 2019

Coordinator: Dr. S. Radha, Prof. & Head, Dr. G. Durga & Dr. S. Joseph Gladwin, Asso. Prof(s).

Speakers: Dr. R. Srinivasan- Professor/IT Dr. G. Durga - Asso.Prof/ECE, Dr. Premanand V. Chandramani - Professor/ECE, Dr. Janakiraman Viraraghavan - Professor/ IIT Madras, Dr. A. Jawahar- Professor/ECE, Dr. Binsu J Kailath - Professor/IIITDM-K, Mr. HemanthKumar - Core EI Technologies, Mr. NavinShankar - Entuple Technologies, Dr. Lakshmi - Asso.Professor/VIT

Sponsor: SSN trust

Participants: 16 participants including the faculty and Research/UG/PG students from various engineering colleges.

3. Seminar on Management, Entrepreneurship and Ethics

Date: 8th Feb. 2020

Organizers: Dr. K. T. Selvan, Prof., Dr. S. Esther Florence and Dr. S. Ramprabhu, Asso. Prof(s).

Speakers: Dr. Thillai Rajan, Professor, Department of Management Studies, IIT-M; Mr. Manoj Raghavan, MD and CEO, Tata Elxsi; Ms. Shyleswari Mohan, Director, Ved Vyas Inner Space.

Sponsor: SSN trust

Participants: 3rd and 4th year UG students

Follow up event

Students' Forum on Management, Entrepreneurship and Ethics

Date: 29th Feb. 2020

Organizers: Dr. S. Esther Florence, Dr. P. Kaythry and Dr. S. Sakthivel Murugan, Asso. Prof(s).

Participants: 3rd and 4th year UG students

4. Comprehensive Hands on Training on MEMS Design Tools

Date: 20th & 21st Feb. 2020

Organizers: Dr. S. Radha, Prof. & Head, Dr. B. S. Sreeja & Dr. S. Esther Florence, Asso. Prof(s).

Speakers: Dr.John Philip Professor, Homi-Bhabha National Institute (HBNI)SO/H, Head, Corrosion Science Technology Division, Head, SMARTS, Metallurgy and Materials Group, Indira Gandhi Centre for Atomic Research, Kalpakkam. Dr. B. Manikandan, Asst. Prof., B. S. Abdur Rahman Crescent Institute of Science & Technology

Sponsor: SSN trust

Participants: 65 students from 3rd year ECE

5. Two-day Webinar on "Elements of Signal Integrity for Digital Data Links"

Date: 20th & 21st May 2020

Organizers: Dr. K. K. Nagarajan, Asso. Prof., Dr. Premanand V Chandramani & Dr. K. T. Selvan, Prof(s).

Speakers: Dr. K. T. Selvan, Prof., Dr. M. Ganesh Madan, Prof./MIT-AU, Dr. Premanand V Chandramani, Prof. & Dr. R. Srinivasan, Prof.

Participants: 19 across Industry and Academia

6. Second International Workshop on "Smart Materials Sensors and Energy Devices 2020"

Date: 25th & 30th May 2020

Organizers: Dr. B.S. Sreeja, Asso. Prof. & Dr. M. Srinivasan, Research Scientist/SSNRC

Speakers: Dr. R. Jayavel, Centre for Nanoscience and Technology, Anna University; Dr. Kentaro Tashiro, International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Namiki, Tsukuba, Japan; Dr. C. Vijayan, Department of Physics, IIT-Madras; Dr. M. Arivanandhan, Centre for Nanoscience and Technology, Anna University; Dr. S .Suresh, Department of Mechanical Engineering, NIT-Trichy, Dr. N. Vijayan, Indian Reference Materials Division (IRM-BND), CSIR-National Physical Laboratory, New Delhi; Dr. Navamadhavan, Division of Physics, School of Advanced Sciences, VIT, Chennai; Dr. Renilkumar Mudachathi, Department of Physics & Nanotechnology, Kattankulathur Campus, SRM Institute of Science and Technology, India; Dr. D. Raghupathy, Department of Chemistry, NIT Puducherry; Dr. Anbuselvan, School of Chemistry, University of Birmingham, Edgbaston, UK; Dr. G. Ramalingam, Department of Nanoscience & Nanotechnology, Alagappa University, Karaikudi; Dr. A. Moorthi, Faculty of Allied Health Sciences, Chettinad Hospital and Research Institute, Chettinad, Academy of Research and Education, Chennai, India

Participants: 250 participants were selected out of 2251 applications from various institutions across India

7. **The Institution of Engineers (India)**, Electronics and Communication Engineering Department Student chapter was inaugurated by *Er. R. Ramdoss, Chairman, IEI, Tamil Nadu State Centre. Dr. C. Annadurai, Asso. Prof.* coordinated the function on **26th Feb. 2020**.

8. *Dr. S. Sakthivel Murugan, Asso. Prof.* and *Dr. I. Nelson, Asso. Prof*. coordinated and conducted the placement and higher studies workshop **"A day with Alumni for future Alumni 3.0"** at SSNCE on **27th Feb. 2020**. The final year and prefinal year students attended the event.

9. *Dr. N.Venkateswaran,Prof.* organised a Image processing workshop during **"TESLA-2020"** organized by AECE, TechClub and IEEE ComSoc on **4th Feb. 2020**.

Glimpses of the Three-day STTP on "Antenna Design and Measurement Techniques"

Prof. Dr. A. K. Shrivastav during the interaction

Prof. Dr. S. Radha during Certificate Distribution

Prof. Dr. K. T. Selvan during the interaction

EVENTS ATTENDED

1. Dr. K. T. Selvan, Prof. in the capacity of Founding Chair, IEEE AP-S Madras Chapter attended Executive Committee meeting held at the IEEE Madras Section office on 25th Jan. 2020.

2. Dr. S. Radha, Prof. & Head delivered a Keynote Lecture in the International Conference on Banana – ICB 2020, held at Tiruchirapalli, during Feb. 22 - 25, 2020. The event was attended by 550 delegates with approximately 100 foreign delegates and more than 10000 farmers in Banana show.

3. Dr. N. Venkateswaran, Prof. & Dr. W. Jino Hans, Asso. Prof. acted as a session chair for the IEEE sponsored 6th International Conference on Bio Signals, Images and Instrumentation (ICBSII 2020) held during 27-28 February 2020, organized by the Department of BME, SSNCE.

4. Dr. S. Karthie, Asst. Prof. participated in an online training programme on "Examination Reforms" organized by AICTE. He also participated in the NPTEL Special Lecture Series on "Overview of 5G technology and 5G Testbed" by Prof. Radhakrishna Ganti, Faculty, IIT Madras in NPTEL-IIT-M.

5. Dr. S. Radha, Prof. & Head and Dr. S. Karthie, Asst. Prof. participated in a webinar on "Leveraging Technology in Education" organized by McGraw Hill Education, India.

6. Dr. S. Karthie, Asst. Prof. participated in a webinar on "Developing Medical Devices Faster using Modeling and Simulation" organized by MathWorks and 2-hr online training programme on "PowerPoint Learning Session" organized by HCL.

7. Dr. M. Gulam Nabi Alsath, Asso. Prof. as Editorial Board member attended the virtual annual board meeting of IET Microwaves Antennas and Propagation on 22nd Apr. 2020.

8. Dr. K. T. Selvan. Prof. completed the following online courses on Coursera.

i. "Design thinking for innovation" by University of Virginia
ii. "Managing the organization" by University of Illinois at Urbana Champaign
iii. "Applications of everyday leadership" by University of Illinois at Urbana Champaign

9. Dr. N. Venkateswaran, Prof., participated in the NPTEL Special Lecture Series on "The Joy of teaching" by Prof. C. Balaji, IIT Madras; "Overview of 5G technology and 5G Testbed" by Prof. Radhakrishna Ganti, IIT Madras; "Towards Explainable AI" Prof. N. Vineeth Balasubramanian, Professor, IIT Hyderabad during April 2020

10. Dr. S. Karthie, Asst. Prof. completed three courses namely "Electrodynamics: An Introduction, Analysis of Electric Fields, and Electric and Magnetic Fields" offered by Korea Advanced Institute of Science and Technology (KAIST) through Coursera. He also participated in a webinar on "Enhancing Research Effectiveness using Scopus, Sciencedirect and Mendeley" organized by Kurukshetra University in collaboration with Elsevier on 1st May 2020.

11. Dr. N. Venkateswaran, Prof. & Dr. S. Esther Florence, Asso. Prof. attended the live webinar as part of DST's 49th Foundation Day celebration "Fighting Corona - Leveraging Scientific Research & Innovation" by Prof. Ashutosh Sharma, Secretary, DST, GoI on 3rd May 2020.

12. Dr. C. Vinoth Kumar, Asso. Prof. participated the online FDP course on "Role of Robotics and AI during COVID-19" conducted by Vel's Institute of Science, Technology and Advanced Studies on 3rd May 2020.

13. Dr. R. Hemalatha, Asso. Prof. attended the webinar on "Internet of Things" hosted by IETE, Mumbai, in association with PANTECH on 4th May 2020.

14. Dr. P. Vijayalakshmi, Professor & Dr. N. Venkateswaran, Professor attended the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP - 2020), from 4th May to 8th May, 2020, a virtual conference conducted by IEEE at Spain, Barcelona.

15. Dr. S. Ramprabhu, Asso. Prof. attended an online technical talk titled "Smart Metering - Technology and Benefits" by Dr. M. P. Selvan, Asso. Prof./NITT organized by IEI TLC and IEI TNSC on 5th May 2020.

16. Dr. K. Muthumeenakshi, Asso. Prof. attended a webinar on "Simulation Tools for Innovative Research" conducted by the Department of CSE, Velammal Engineering College, Chennai on 5th May 2020.

17. Dr. G. Durga, Asso. Prof. participated in the 3-day e-certified online skill development program on ASIC - Physical Design and Verification using Mentor toolset, from 7th to 9th May 2020 conducted by CoreEl Technologies

18. Dr. S. Sakthivel Murugan, Asso. Prof. attended the following webinars during May 2020 :

i."Oceans - The give and take" by Dr. M. A. Athmanand - Director, NIOT and "Technology Development for the exploration and harvesting of deep ocean minerals" by Dr. G. A. Ramadass - Project Director, Deep Sea Mining, NIOT organized by Indian Institute of Tropical Meteorology (IITM).

ii. International Faculty Development Program on Disruptive Technologies webinar organized by AVIT on "Electrical Vehicle on the grid - Challenges and opportunities", "Demystifying Process Automation", "Data Analytics & Tools", "Drone Industries Insight", "Opportunities in Marine Field" and "UAV Communication"

iii. "VMX Data Processing - Start to Finish" organized by RIEGL

iv. ASA Open Technical Committee Meeting teleconferences of "Physical Acoustics"

v. "Boresight Calibration: Demo of how to create a point cloud" and "Error factors that affect point cloud accuracy" organized by OXTS

vi. "Discover TcpGPS + TcpMDT on ZWCAD 2020" organized by APLITOP

vii. "Image Processing - Python", "IoT using Arduino", "Virtual Reality", "Electric Vehicles", "Deep Vision for Autonomous Vehicles" and "Renewable Energy Resources using Matlab" organized by Pantech E - Bytes 2020 & other institutions in India.

viii. "Distributed Temperature Sensing for Real-Time Power Line Monitoring using Raman Scattering in Optical Fibres", "Biomedical Application of Fiber Bragg Grating Sensors", "Construction Procedures for Optical Fiber Sensors" and 3-day workshop series on "Recent Trends and research Opportunities in 5G & Beyond" organized by SRM University, Kattankulathur

19. Dr. S. Ramprabhu, Asso. Prof. attended a webinar on "Business and Professional Etiquette" by Suneeta Sodhi Kanga on 14th May 2020 and "The Design Thinking Refresher Session" conducted by the School of Design Thinking on 29th May 2020.

20. Dr. A. Jawahar, Prof. participated in the Technical Webinar on "Distributed Temperature Sensing for Real-Time Line Monitoring for Raman Scattering in Optical Fibers" presented by Prof. Balaji Srinivasan, Department of Electrical Engineering, IIT, Madras organized by IE(T), Kattankulathur Local Centre and Department of ECE, SRM Institute of Science and Technology on 16th May 2020.

21. Dr. M. Gulam Nabi Alsath, Asso. Prof. attended the two-day webinar on "Elements of signal integrity for digital data links" organized by the Department of ECE, SSNCE on 20th and 21st May 2020. He also attended e-Quiz on "Online Teaching Methodology" organized by the Department of Mathematics, Sathyabama Institute of Science and Technology.

22. Dr. C. Annadurai, Asso. Prof. attended the online FDP on "Exploring Machine Learning Algorithms and Applications" and "Programming IoT using Arduino and Tinkercad" by Dept. of CSE, Kongu Engineering College, Perundurai, Erode during May 2020.

23. Dr. M. Gulam Nabi Alsath, Dr. K. Muthumeenakshi and Dr. S. Kirubaveni Asso. Prof(s), participated in the second international workshop on "Smart Materials Sensors and Energy Devices SMSED 2020" hosted by the Department of ECE, SSNCE from 25th to 30th May 2020.

24. Dr. B. Ramani, Asso. Prof. attended the Webinar Series on "AatmNirbhar Bharat" on "Post COVID-19: Role of Science and Technology towards a Self Reliant India" by Prof. Ashutosh Sharma, Secretary, DST, GoI organized by IEEE Bangalore Section in association with IEEE India Council and webinar on "Machine Learning an Exploratory Tool: Key Concepts and Programming" by Dr. Amlan Chakrabarti, Prof. and Director, A. K. Choudhury School of IT, University of Calcutta, Distinguished Speaker at IEEE, jointly organized by Computer Society of India, Chennai, ACM Chennai and IEEE Computer Society, Madras on 24th and 25th May 2020. She also attended e-Quiz on "Online Teaching Methodology" organized by the Department of Mathematics, Sathyabama Institute of Science and Technology and secured merit score in the quiz. In addition, she attended a webinar on "Deep Learning with Neural Networks" by Dept of CSE, SKITM, Indore & Pantech E-Learning.

25. Dr. N. Edna Elizabeth, Prof. attended webinars on "AI/ML advancements and potential applications" conducted by IEEE Madras section and "Secure use of remote access and work from home technologies" organized by Society for Electronic Transactions and Security (SETS), Chennai during May 2020.

26. Dr. S. Esther Florence, Asso. Prof. attended the BrightTALK webinar on "Light/Matter Interactions: Illuminating Materials and Researchers" and an FDP on "Enhancing Interpersonal Relationships for the Teaching Community" by the Department of MBA, SRM Easwari Engineering College, Chennai on 27th May 2020.

27. Dr. B. Ramani, Asso. Prof. completed the online courses “Create your first Python program” offered by Rhyme and “Neural Networks and Deep Learning” offered by deeplearning.ai on Coursera.

28. Dr. N. Edna Elizabeth, Prof. completed “Create Your First Python Program” an online non-credit course authorized by Rhyme and offered through Coursera.

29. Dr. I. Nelson, Asso. Prof. completed “Exploratory Data Analysis with MATLAB” offered on Coursera.

30. Dr. K. S. Vishvaksenan, Asso. Prof. completed the following online courses through Coursera:

i. “Artificial intelligence”, 4-week course by Computer Science Department, Stanford University.

ii. “Blockchain Basics”, 4-week course by Computer Science and Engineering Department, The State University of New York.

iii. “Matrix for Engineers”, 4-week course by Department of Mathematics, The Hong Kong University of Science and Technology.

iv. “Introduction to the Internet of Things and Embedded Systems”, 4-week course by Department of Computer Science, University of California, Irvine.

v. “Machine learning for all”, 4-week course by Computing Department, University of London.

vi. “Mathematics for Machine Learning: Linear Algebra”, 5-week course by Imperial College, London.

31. Dr. P. Vijayalakshmi, Prof. completed an online course on “Sequence models” offered by Andrew Ng, Professor, Stanford University through Coursera.

32. Dr. R. Hemalatha, Asso. Prof. completed “Neural Networks and Deep learning” and “Improving Deep Neural Networks: Hyper parameter tuning, Regularization and Optimization” through Coursera

33. Dr. C. Vinothkumar, Asso. Prof. completed an online course “Introduction to Machine Learning” on Coursera.

34. Dr. S, Esther Florence, Asso. Prof. has completed “Introduction and Programing with IoT boards”, “Create Your First Python Program” and “Build Data Analysis tools using R and DPLYR” through Coursera.

35. Dr. R. Amutha, Prof. completed two online courses on Coursera (i)“Programming for Everybody Getting started with Python” (2) Python programming for datastructure.

36. Dr. C. Annadurai, Asso. Prof. completed “Machine learning for All” on Coursera.

37. Dr. C. Annadurai, Asso. Prof. attended the following webinars:

i. "EEG Signal Analysis using Matlab" hosted by AVIT, Chennai & Pantech E-Learning.

ii. "Latest Trends in Power Electronics Simulation using Matlab" hosted by St. Peters College of Engineering & Technology & Pantech E-Learning.

iii. "Covid-19 Infodemic & Communication Challenges" hosted by Kalaignarkarunanidhi Institute of Technology, Coimbatore.

iv. "VLSI Simulation Analysis using Modelsim" hosted by GRIET, Hyderabad & Pantech E-Learning.

v. "Implementation of Industry 4.0 for e-Drives" hosted by Dept. of EEE, Panimalar Engineering College, Chennai & Pantech E-Learning.

vi. "Python Programming" hosted by Dept. of ECE, Dhanalakshmi Srinivasan Institute of Technology & Pantech E-Learning.

38. Dr. R. Kishore, Asso. Prof. completed "Blockchain Basics" authorized by University at Buffalo and The State University of New York offered through Coursera. He also participated in the following events:

i. Technical webinar on "Distributed Temperature Sensing for Real - Time Power Line Monitoring for Raman Scattering in Optical Fibers" organized by IE(I), Kattankulathur Local Centre and Department of ECE, SRMIST.

ii. Technical webinar on "How AGRI and IoT get connected" organized by Mohamed Sathak Engineering College and Pantech Solutions.

iii. Blue Book Series E-Quiz 2020 (Edition 1) organized by Department of CSE, SRMIST and secured merit score.

iv. One-day National Level webinar on "Mathematics in Machine Learning" organized by Department of Mathematics, SSNCE.

v. Technical webinar on "Recent development in Cloud Computing" organized by Department of CS & IT, Thangavelu Engineering College.

vi. Aptitude test for faculty on "Outcome Based Teaching and Learning Process (OBTL)" organized by Usha Rama College of Engineering and Technology, Vijayawada and secured merit score.

vii. Technical webinar on "Development of Deep Learning Architecture" organized by IETE (Mumbai) and Pantech Solutions.

viii. Technical webinar on "Digital Transformation" organized by Department of CS & Tech., SRMIST.

ix. Technical webinar on "Challenges in Advanced Automotive Software Systems Validation"

x. National level E-Quiz organized by I-Math Club of PSNA College of Engineering and Technology and secured merit score.

xi. National level E-Quiz on "Applied Mathematics" organized by the Department of Mathematics, Mohamed Sathak AJ College of Engineering and secured merit score.

xii. "Cyber Talk Series I" organized by the Department of IT, SSNCE.

xiii. Webinar titled "Secure use of remote access and work from home technologies" organized by Society for Electronic Transactions and Security (SETS), Chennai.

xiv. "International Workshop on Big Data Analytics - IWBDA 2020" organized by Department of CSE, SSNCE.

xv. E-Quiz on "Online Teaching Methodology" organized by the Department of Mathematics, Sathyabama Institute of Science and Technology and secured merit score.

xvi. Technical webinar on "Conversational BOT Design" organized by IETE (Mumbai) and Pantech Solutions.

39. Dr. W. Jino Hans and Dr. S. Kirubaveni, Asso. Prof(s) completed "Learning how to learn: Powerful mental tools to master tough subject" on Coursera.

40. Dr. S. Kiruba Veni attended e-Quiz on "Online Teaching Methodology" organized by the Department of Mathematics, Sathyabama Institute of Science and Technology.

41. Dr. K. Muthumeenakshi, Asso. Prof. completed the course "Neural Networks and Deep learning" on Coursera.

42. Dr. M. Anbuselvi, Asso. Prof. completed "Control of mobile robots" authorized by Georgia Institute of Technology and "Programming for all (Getting started with Python)", authorized by University of Michigan through Coursera. She also attended the following webinars.

i. "Impact of Electric vehicles in the Post COVID World" hosted by IEEE India Council ICNL and ECIM team.

ii. "Electric vehicles" hosted by Pantech Solutions.

iii. "Automatically Build tinyML Solutions on Embedded Devices" by Qeexo & Mary Bennion, Arm AI Ecosystem.

PROFESSIONAL ROLES

1. Dr. P. Vijayalakshmi & Dr. K. T. Selvan Prof(s). as “University Nominee” attended the Board of Studies meeting.

2. Dr. R. Jayaparvathy was appointed as Expert Member of the NBA Accreditation Team to Kurnool, Andhra Pradesh during Feb. 2020

3. Dr. S. Radha, Prof. & Head, Dr. P. Vijayalakshmi, Dr. R. Amutha, Dr. N. Venkateswaran, Dr. R. Jayaparvathy, Prof(s).,Dr. B. S. Sreeja; Dr. M. Gulam Nabi Alsath; Dr. S. Esther Florence & Dr. C. Annadurai, Asso. Prof(s)., as members of the Doctoral Committee attended the meetings hosted by various institutes like PSG Tech, Coimbatore; VIT Chennai; SRM University; Muthayammal Engineering College.

4. On 20th Jan. 2020, Dr. S. Joseph Gladwin, Asso. Prof. as SPOC for Smart India Hackathon 2020 and he organized the Internal Hackathon to shortlist the top teams from SSN to participate in the SIH 2020. Dr. N. Edna Elizabeth, Dr. R. Amutha, Dr. N. Venkateswaran, Prof(s) and Dr. C. Vinothkumar, Asso. Prof. acted as Jury for the same.

5. Dr. K. T. Selvan, Prof. conducted PhD viva for his doctoral student Mr. S. Rajkumar on 20th Jan. 2020. The external oral examiners were Prof. K.J. Vinoy, IISc Bengaluru, and Dr. Basubed Ghosh, IIST Trivandrum.

6. Dr. S. Radha, Prof & Head along with Dr. R. Amutha, Dr. A. Jawahar & Dr. N. Edna Elizabeth, Prof(s) evaluated the poster presentations made by SSNCE full-time scholars during SSN Doctoral Day.

7. Dr. P. Vijayalakshmi and Dr. N. Edna Elizabeth evaluated the oral presentations made by SSNCE full-time scholars during SSN Doctoral day.

8. Dr. G. Durga, Asso. Prof. reviewed a research paper for Journal of Computational Electronics.

9. Dr. S. Esther Florence, Asso. Prof. reviewed papers for IEEE Transactions on Antennas and Wave Propagation.

10. Dr. C. Vinothkumar, Asso. Prof. reviewed papers for the International Conference WiSPNET 2020. He also reviewed papers for the International Conference on Computer, Communication and Signal Processing (ICCCSP 2020) and a paper for the Journal Artificial intelligence review.

11. Dr. K. T. Selvan, Prof. reviewed papers submitted to the International Journal of Electronics and Communications and IEEE Antennas and Wireless Propagation Letters. He also reviewed four papers for WiSPNET 2020.

12. Dr. M. Gulam Nabi Alsath, Asso. Prof. reviewed research articles submitted to IEEE Transactions on Vehicular Technology, IEEE Antennas and Wireless Propagation Letters & International Journal of RF and Microwave Engineering. He, as an Associate Editor of IET Microwaves Antennas and

Propagation edited 7 papers and communicated the decision to the Editor-in-Chief, Dr. Tim C. Brown, University of Surrey, England.

13. Dr. R. Amutha, Prof. reviewed a paper for the possible publication in the journal IEEE Transactions on Evolutionary Computation.

14. Dr. R. Hemalatha, Asso. Prof. reviewed manuscripts submitted to The Computer Journal, IEEE Access journal and WiSPNET 2020.

15. Dr. N. Venkateswaran, Prof. reviewed number of research articles submitted to the International Journal of Biomedical Imaging, Measurements, Computers in Biology and Medicine, ICBSII 2020, ICCCSP 2020, ICCIDS 2020 and WiSPNET 2020.

16. Dr. N. Venkateswaran, Prof. reviewed the projects submitted to SIH 2020 Internal Hackathon on 10th Jan. 2020 and acted as a member of the Jury team held on 20th Jan. 2020. Dr. M. Gulam Nabi Alsath and Dr. S. Kiruba Veni, Asso. Prof(s) are organising committee members for the Internal Hackathon to shortlist the top teams from SSN to participate in the SIH 2020.

17. Dr. R. Jayaparvathy, Prof. reviewed papers for WISPNET 2020 and Asian Journal of Computer Science

18. Dr. R. Jayaparvathy along with Prof. Ganesh Samudra and Prof. Idy Chandy visited the Mechanical and Chemical Engineering Departments of SSN, for mock audit during NBA Compliance visit

19. Dr. W. Jino Hans, Asso. Prof. reviewed a paper for IET Intelligent Transportation System & 2 papers for WiSPNET 2020.

20. Dr. N. Venkateswaran, Prof. conducted the Ph.D. Viva-voce examination for his research student, Mr. Markandan on 7th Feb. 2020.

21. Dr. B. Ramani, Asso. Prof. reviewed 2 papers for the International Conference on Computer, Communication, and Signal Processing ICCCSP 2020 to be organized by the Department of IT, SSNCE.

22. Dr. Premanand V. Chandramani & Dr. N. Edna Elizabeth, Prof(s) reviewed 4 articles each for WiSPNET 2020 to be held in the Department of ECE, SSNCE. Dr. N. Edna Elizabeth also reviewed one paper for KSII Journal.

23. Dr. C. Annadurai, Asso. Prof. reviewed three papers submitted to Springer's Cluster Computing.

24. Dr. S. Karthie, Asst. Prof. reviewed two manuscripts for IEEE Access Journal.

25. Dr. R. Amutha, Prof. and Dr. K. Muthumeenakshi, Asso. Prof. reviewed papers submitted to WiSPNET 2020.

26. Dr. B. Ramani, Asso. Prof. is recognized and elevated to Senior Member Grade in IEEE.

27. Dr. S. Esther Florence, Asso. Prof. is the recipient of "Shri Pralhad P Chhabria Award Best Woman Professional (Early Career)" for the year 2020 given by Hope Foundation and Research

Centre, IEEE India Council and WiE, IEEE Pune Chapter. This was announced on 12th Mar. 2020.

28.Dr. P. Vijayalakshmi, Prof. reviewed papers submitted to IET Signal processing, IEEE Signal Processing Letters, IEEE Access and IEEE/ACM Transactions on Audio, speech and language processing. She also reviewed 3 papers submitted to IEEE SPCOM conference.

29. Dr. S. Ramprabhu, Asso. Prof. reviewed a paper each from Circuit World and IEEE Transactions on Electromagnetic Compatibility.

FACULTY UPDATES

1. Mr. S. Karthie, Asst. Prof. under the guidance of Dr. S. Salivahanan, Principal, successfully defended his PhD thesis titled “Investigations on fractal-based microstrip bandpass filters for wireless applications” on 28th Feb. 2020.

2. Ms. S. Hanis, Asst. Prof. under the guidance of Dr. R. Amutha, Prof. successfully defended her PhD thesis titled “Design and Analysis of Chaotic map and Chaotic key based encryption algorithms for digital images” on 28th Feb. 2020.

Mr. S. Karthie

Ms. S. Hanis

RESEARCH NEWS

GRANTS RECEIVED

1. Dr. R. Jayaparvathy, Prof. as PI and Dr. M. Gulam Nabi Alsath, Asso. Prof. as Co-PI received the sanction for a grant of 31.15 lakhs for the project entitled “Assessment and Monitoring of Invasive Alien Plant Species in India and formulation of strategies for management of key Invasive Alien Plant Species in different regions of the country” under the All India Coordinated Research Project (AICRP-7) Scheme under MOEFCC, Govt of India for a period of five years (2020 – 2024).

PROPOSALS SUBMITTED

1. A proposal for Technology Innovation Hub under National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) worth Rs. 104.34 crore has been submitted to DST-SERB, Government of India in the Advanced Communication Systems domain area. Dr. S. Salivahanan, Principal as Chairman, Dr. S. Radha, Prof & Head as Director, and Dr. R. Kishore, Asso. Prof., Dr. B. S. Sreeja, Asso. Prof., Dr. M. Gulam Nabi Alsath, Asso. Prof., Dr. S. Esther Florence, Asso. Prof., Dr. N. Prabagarane, Asso. Prof., Dr. N. Bhalaji, Asso. Prof./IT as team members submitted the proposal along with International and Industry collaborators on 16th Jan. 2020.

2. Dr. K. Sathish Kumar, Asso. Prof./Chemical as PI & Dr. R. Kalidoss, Asso. Prof. as Co-PI submitted a project proposal titled “Ameliorating the activity of pharmaceutical effluent degrading enzyme, immobilized onto porous and nonporous magnetic nanoparticles” to the Department of Earth science worth Rs. 34.335 lakh for a duration of 3 years.

3. Dr. C. Annadurai & Dr. I. Nelson, Asso. Prof(s) submitted the project proposal titled “On the development of an IoT ecosystem for smart farming in Indian scenario,” to DST-SERB worth Rs. 43,78,440/- on 3rd Mar. 2020.

4. Dr. B. Ramani, Asso. Prof. submitted a proposal titled “Development of a Mobile-based Application for Efficient Farming” worth Rs. 6.48 Lakh to TNSCST.

5. Dr. W. Jino Hans, Asso. Prof. submitted a proposal titled “Development of a real-time stray cattle monitoring and reporting system using computer vision techniques” to TNSCST.

6. Dr. K. Muthumeenakshi, Asso. Prof. as PI, Dr. S. Radha, Prof & Head and Dr. Esther Florence S, Asso. Prof as Co-PI, submitted a project proposal titled “Design and Implementation of RF Energy Harvesting Technique for a Smart and Self powered Precision Agriculture System” to TNSCST.

7. Dr. R. Hemalatha, Asso. Prof. submitted a project proposal titled “Development of A LoRAWAN based Disease Detection System for Coffee Plants in Lower Pulney Hills” worth Rs. 9.24 Lakh to TNSCST. Dr. S. Radha, Prof & Head is the Co-PI.

8. Dr. G. Durga, Asso. Prof. submitted a project proposal titled “Design and Development of a wrist wearable device for women in distress” worth Rs. 4.1 Lakh to TNSCST. Dr. S. Joseph Gladwin, Asso. Prof. is the Co-PI.

9. Dr. R. Jayaparvathy, Prof. submitted a project proposal titled “Enhanced Elephant Intrusion Monitoring and Alert System along the Western Ghat Forest borders for Human Elephant Conflict Mitigation” worth Rs. 10.2 Lakh to TNSCST. Dr. M. Gulam Nabi Alsath, Asso. Prof. is the Co-PI.

10. Dr. N. Venkateswaran,Prof. as PI, submitted a project proposal titled “Grievance Register for Smart Cities” worth Rs. 9.9 Lakh to TNSCST.

11. Dr. S. Kirubaveni, Asso. Prof. submitted a project proposal titled “Design and Fabrication of Self-Powered IOT Based Hybrid Sensor for Acceleration and Gas Sensing in Sewage Treatment Plant” worth Rs. 10 Lakh to TNSCST. Dr. S. Radha, Prof & Head and Dr. R. Govindarajan. Scientist / SSN RC are the Co-PIs.

12. Dr. R. Amutha, Prof. submitted a project proposal titled “Design and Development of low-cost rehabilitation system for post stroke patients” worth Rs. 7.91 Lakh to TNSCST. Dr. R. Rajavel, Asso. Prof. is the Co-PI.

13. Dr. K. S. Vishvaksenan, Asso. Prof. as PI & Dr. R. Kalidoss, Asso. Prof. as Co-PI submitted a project proposal titled “De-convolution carving based 3D Reconstruction of underwater object detection using wide-aperture imaging sonar and wireless communication” worth Rs. 37.59 lakh to Department of Earth Science in collaboration with Sastra University, Thanjavur. Dr. R. Narasimhan Renga Raajan & Dr. Balasubramanian Ganesan, are investigators from Sastra University.

14. Dr. C. Vinoth Kumar, Asso. Prof / ECE as PI & Dr. K. Nirmala, Asso. Prof. / BME as Co-PI submitted a project proposal titled, “Non-invasive technique to estimate WBC from optical image of nailfold microcirculation” worth Rs. 24.48 Lakh to DST-SERB.

15. Dr. S. Ramprabhu, Asso. Prof as PI submitted a project proposal titled, “Development of flexible frequency selective surface-based guard for minimizing electromagnetic radiation from mobile phones”, worth Rs 18.82 Lakh to AICTE under RPS Scheme.

16. Dr. K. J. Jegadish Kumar and Dr. M. Gulam Nabi Alsath, Asso. Prof(s) submitted the project proposal titled “Design and Experimental analysis of Ingestible Antenna for high-performance endoscopy capsule,” to DST-SERB worth Rs 40.52 Lakh on 7th Mar. 2020.

BOOK CHAPTER

1. Dr. P. Vijayalakshmi, Prof., Ms. M. Dhanalakshmi, Asst. Prof./BME, Dr. T. Nagarajan, Prof & Head/IT, published a book chapter titled “Assessment and intelligibility modification for dysarthric speech”, Voice technologies for speech reconstruction and enhancement, Chapter 3 in De Gruyter Series, February 2020, pp. 67-94. ISBN: 978-1-5015-0126-5.

2. Ms. K. Keerthana, (PG-CS 2016-2018 Batch), Dr. S. Aasha Nandhini, RA, Dr. S. Radha, Prof. & Head published a book chapter titled “Cyber Physical Systems for Healthcare Applications using Compressive Sensing” in Advances in Ubiquitous Sensing Applications for Healthcare: Compressive Sensing in Healthcare, Chapter 9, pp. 165-179, 2020.

INTELLECTUAL PROPERTY RIGHTS

On 10th Mar. 2020, the following applications were presented for recommendations to file the outcome of the research as a patent.

1. Dr. S. Radha, Prof & Head, Dr. R. Hemalatha, Asso. Prof., Dr. S. Aasha Nandhini, RA and Ms. Shreya Gaur, III year, "Device and Method for Plant Disease Detection and Alert".

2. Dr. S. Radha, Prof. & Head, Dr S Kirubaveni, Asso. Prof., Ms. R. Kruthika, JRF, "Multifunctional Sensor for detection of toxic gases (methane and Carbon Monoxide) and pipeline leakages in Sewage system".

3. Dr. S. Radha, Prof & Head, Dr. B.S.Sreeja, Asso. Prof., Ms. R Indhu, Research Scholar and Dr. E. Manikandan "Ultrafast Laser Micro machined Low – cost Microfluidic Lab on Chip for Cancer Cell Separation".

4. Dr Esther Florence, Asso. Prof., Sakthi Abirami, JRF, Dr Vimal Samsingh, Asso. Prof./Mech, "Quad Band RF Shield using a mechanically configurable venetian blind structure".

JOURNAL ARTICLES

1. Ala Khalifeh, German Jordanian University, R. Kishore, Asso. Prof., Khalid A. Darabkh, The University of Jordan, Ahmad M. Khasawneh, Amman Arab University, Omar AlMomani, The World Islamic Sciences and Education University, & Zinon Zinonos, Neapolis University Paphos, "On the Potential of Fuzzy Logic for Solving the Challenges of Cooperative Multi-Robotic Wireless Sensor Networks," Electronics, vol. 8, no. 12, pp. 1513, Dec. 2019.

2. Ramesh, SR & Jayaparvathy, R, 'Artificial Neural Network Model for Arrival Time Computation in Gate Level Circuits', Automatika Journal for Control, Measurement, Electronics, Computing and Communications. Taylor& Francis Publishers, vol. 60, no.3, pp. 360-367, 2019.

3. R. Jansi, RS & R. Amutha, Prof., "Detection of fall for the elderly in an indoor environment using a tri-axial accelerometer and Kinect depth data," Multidimensional Systems and Signal processing, pp. 1-19, Jan. 2020.

4. C. Ganesh Kumar, RS & Premanand V. Chandramani, Prof., "An Optimized Methodical Energy Management System for Residential Consumers Considering Price-Driven Demand Response Using Satin Bowerbird Optimization," Springer's Journal of Electrical Engineering and Technology, Jan. 2020.

5. Madeshwari K, Asso. Prof./CSE & N. Venkateswaran, Prof., "Optimal fusion aided face recognition from visible and thermal face images," in Multimedia Tools and applications, Springer Journal, Jan. 2020.

6. K. R. Sarath Chandran, Asst. Prof./ CSE & Premanand V. Chandramani, Prof., "Hardware-software co-design framework for sum of absolute difference based block matching in motion estimation," Elsevier's Microprocessors and Microsystems, Feb. 2020.

7. T. A. Mariya Celin, RS, T. Nagarajan, Prof. & Head/IT & P. Vijayalakshmi, Prof., "Data Augmentation using virtual microphone array synthesis and multi-resolution feature extraction for isolated word dysarthric speech

recognition," IEEE Journal of Selected Topics on Signal Processing, vol. 14, no. 2, pp. 346 – 354, Feb. 2020.

8. M. P. Actlin Jeeva, Asst. Prof./KL University, T. Nagarajan, Prof. & Head/IT, P. Vijayalakshmi, Prof., "Adaptive multi-band filter structure-based far-end speech enhancement," IET Signal Processing, Mar. 2020.

9. P. Devi Sowjanya, RS, B. Pranamika, UG-ECE 2015-2019, M. Gulam Nabi Alsath, Asso. Prof., Dr. S. Kirubaveni, Asso. Prof., V. Nilavathani & S. Udaya Ezhil, UG-ECE 2015-2019, "Reconfigurable Bow-Tie Based Filtering Antenna for Cognitive Radio Applications," International Journal of RF and Microwave Computer-Aided Engineering, Mar. 2020.

10. S. Padmathilagam, RS/CEG, K. Malathi, Asso. Prof./CEG, N. Rajesh, Faculty/VIT, M. Gulam Nabi Alsath, Asso. Prof., P. Sandeep Kumar, Asst. Prof./SRM, "Miniaturized Button like WBAN Antenna for Off body Communication," IEEE Transactions on Antennas and Propagation, Mar. 2020

11. M. Varun (RS), C. Annadurai, "PALM-CSS: a high accuracy and intelligent machine learning based cooperative spectrum sensing methodology in cognitive health care networks," Journal of Ambient Intelligence and Humanized Computing, Mar. 2020.

12. V. Angeline Beulah, RS & N. Venkateswaran, Prof., "Sparse linear array in the estimation of AoA and AoD with high resolution and low complexity," Transactions on Emerging Telecommunications Technologies, Wiley, pp. 1-14, vol. 31, no. 4, Apr. 2020.

13. N. Venkateswaran Prof, W. Jino Hans, Asso. Prof., & N. Padmapriya, Asso. Prof./ Maths, "3D design of orthotic casts and braces in medical applications," Journal of Advances in Materials and Processing Technologies, Taylor & Francis, 2020.

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CONFERENCE PRESENTATIONS

1. S. Mary Cecilia, RS & S. Sakthivel Murugan, Asso. Prof., N. Padmapriya, Asst. Prof./Maths, "Analysis of Various Dehazing algorithms for Underwater images," Procs. of 2019 International Symposium on Ocean Technology (SYMPOL 2019) held at Cochin University of Science and Technology (CUSAT), Cochin during Dec 11-13, 2019. The paper received the 'Best paper Award'.

2. M. Vimal Raj, RS & S. Sakthivel Murugan, Asso. Prof., "Underwater Image Classification using Machine Learning Technique" Procs. of 2019 International Symposium on Ocean Technology (SYMPOL 2019) held at Cochin University of Science and Technology (CUSAT), Cochin during Dec 11-13, 2019. The paper received the 'Best paper Award'.

3. G. Annalakshmi, RS, S. Sakthivel Murugan, Asso. Prof. & S. Ramasundaram, Scientist D – NIOT, "Side Scan Sonar images-based ocean bottom sediment classification" Procs. of 2019 International Symposium on Ocean Technology (SYMPOL 2019) held at Cochin University of Science and Technology (CUSAT), Cochin during Dec 11-13, 2019. The paper received the 'Best paper Award'.

4. M. Dhanalakshmi, JRF, S. Sakthivel Murugan, Asso. Prof., N. Padmapriya, Asst. Prof. /Maths & M. Somasekar, RS, "Texture Analysis on Side Scan Sonar images using EMD, XCS-LBP and Statistical Co-occurrence" Procs. of 2019 International Symposium on Ocean Technology (SYMPOL 2019) held at Cochin University of Science and Technology (CUSAT), Cochin during Dec 11-13, 2019. The paper received the 'Best paper Award'.

5. Ms. R. Indhu, RS, S. Radha, Prof. & Head, E. Manikandan, Asst. Prof./ BSA Crescent University & B. S. Sreeja, Asso. Prof., "Rapid Femtosecond Laser Micromachining of Microfluidic Device on Polymer Substrate," Procs. of the 28th DAE-BRNS National Laser Symposium (NLS-28) held at VIT Chennai from 8th to 11th Jan. 2020.

6. M. Dhana Lakshmi, JRF, S. Sakthivel Murugan, Asso. Prof., N. Padmapriya, Asso. Prof., "ConvNet based Object Detection in Submersible captured images" in Challenges in Earth System Science for Global Sustainability (CESS-GS 2020) held at IIT Kharagpur during Jan. 15th to 17th, 2020.

7. K. Balaji, RS & S. Sakthivel Murugan, Asso. Prof., "Analysis of Channel Losses for implementation of optical communication in underwater", in Challenges in Earth System Science for Global Sustainability (CESS-GS 2020) held at IIT Kharagpur during Jan. 15th to 17th, 2020. The paper received the 'Best Presenter Award'.

8. M. Vimal Raj, RS, S. Sakthivel Murugan, Asso. Prof., Dr. N. Padmapriya, Asso. Prof./ Maths, "Underwater Image Processing using Hyperparameter algorithms" in Challenges in Earth System Science for Global Sustainability (CESS-GS 2020) held at IIT Kharagpur during Jan. 15th to 17th, 2020. The paper received the 'Best Presenter Award'.

9. Taruna Sudhakar, V. S. Sundar Sripada, IV ECE students & N. Venkateswaran, Prof., "Synthesis and Evaluation of Improved Reference Matrix Models for High Capacity Image Steganography" in the Proc. of International Conference on Artificial Intelligence and Signal Processing AISP'20 held at VIT, Andhra Pradesh during Jan. 10th - 12th, 2020.

10. Anand Subramanian, N. Venkateswaran, Prof. & W. Jino Hans, Asso. Prof., "Kinect Based Outdoor Navigation for the Visually Challenged using Deep Learning," International Conference on Modelling, Simulation & Intelligent Computing MOSICOM, 2020 held at BITS, Dubai Campus.

11. Bharath Raj, Anand Subramanian, Kashyap Ravichandran, (UG-2019 batch) and N. Venkateswaran, Prof., "Exploring Techniques to Improve Activity Recognition using Human Pose Skeletons", 2nd International Workshop on Human Activity Detection in multi-camera, Continuous, long-duration Video (HADCV'20) , IEEE Winter Conf. on Applications of Computer Vision (WACV) Aspen, Colorado.

12. S. Sakthivel Murugan, Asso. Prof., "Underwater Image Recognition using Deep ConvNet," 26th National Conference on Communications (NCC) held at IIT Kharagpur held on 21st to 23rd of Feb. 2020.

13. R. Kiruthika, RS, S. Radha, Prof. & Head, V. Shyamala, PG-VLSI 2018-2020 & S. Kirubaveni, Asso. Prof., "Fabrication and characterization of ZnO based thin film for methane gas sensing application," in the Proc. of International Conference on Instrumentation, MEMS and Biosensing Technology 2020 held during Feb. 13-15, 2020, at SRM, Kattankulathur, Chennai.

14. N. Ambika, RS, K. Muthumeenakshi, Asso. Prof. & Dr. S. Radha, Prof. & Head, "Classification of Primary User Occupancy Using Deep Learning Technique in Cognitive Radio" in the Proc. of International Conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020) held at VIT, Vellore during 27th Feb. 2020.

15. J. Vikneshwar & K. Muthumeenakshi, Asso. Prof. & Dr. S. Radha, Prof. & Head, "Classification of Primary Users using Deep Residual Learning" in the Proc. of International Conference on Automation, Signal Processing, Instrumentation and Control (iCASIC 2020) held at VIT, Vellore during 27th Feb. 2020.

16. Dr. A. Jawahar, Prof. & Ms. Vanitha Veni, PG student, "Design of Quantum Gates for Arithmetic and Logic Circuits" in the virtual Research conference on IoT, Cloud, and Data science held at SRM University, Vadaplani campus, May 2020.

17. Pavithra Guru. R RS and V. Vaithianathan, "Ant Colony Optimization Based Partition Model for VLSI Physical Design," 2020 International Conference on Computer Communication and Informatics (ICCCI), Coimbatore, India, 2020, pp. 1-5, doi: 10.1109/ICCCI48352.2020.9104175.

CONSULTANCY SERVICES

1. Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Dr. S. Ramprabhu & Dr. S. Esther Florence, Asso. Prof(s). executed consultancy work for Rs. 20,060/- for research scholars from Indian Institute of Space Technology, Trivandrum and Veltech Multitech Dr RR & Dr SR Engineering College, Chennai during Dec. 2019.

2. Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Dr. S. Ramprabhu & Dr. S. Esther Florence, Asso. Prof(s). generated a revenue of Rs. 41890/- through Antenna and Filter Measurements during the month of Jan. 2020. The clients were from ELK Education Consultants, Pondicherry University, Vignan's University and PSG Institute of Technology.

STUDENT'S CORNER

TECH CLUB REPORT

Since its inception in 2014, Tech Club SSN serves to elevate student involvement in the fields revolving around Electronics and computer science. We do this by conducting classes on booming fields such as IOT, Robotics and Machine Learning. We organize technical events and hackathons around the year where students can apply their newly acquired skills. Our moto is to guide our juniors to pursue their aspirations in the fields of their interest by preparing them for internships, independent research work, significant technical events and hackathons.

PLACEMENT TALK:

This semester's activities started with the placement talk, considering the placement season starting shortly for the 3rd year students, a talk was arranged to help the students get valuable information on what to expect from the hiring process and how to prepare for it. The talk was delivered by fourth year students who were placed in various companies. The domains were spilt as Core/Management/ Analytics/IT and the respective students placed in the companies shared their insight on how to approach the placement process of the respective companies.

CERTIFICATION COURSES:

In view of sharing our knowledge, four courses were organized in the domains of IoT, Deep Learning and Computer Vision, Full Stack development and Antenna design. Each course spanned for a month and the students taking part were to be given certificates for completing the course.

- **IOT AND INTRODUCTION TO NETWORK ANALYSIS USING WIRESHARK:**

This course comprised of the four sessions and dealt with the explanation of Networking basics such as protocols, APIs and routing. The core topic of the course was to provide students with a hands-on experience with ESP8266 in order to build their own IoT project. Concepts on how to interface MCUs, connect them to a cloud and building an application was taught. The course also covered an introduction to network analysis using Wireshark (a network analysis tool) where the packets communicated through the local access point were analysed for their parameters. The course comprised of weekly assignments and materials uploaded to GitHub.

- **DEEP LEARNING AND COMPUTER VISION:**

The Deep Learning and Computer Vision course started by introducing the class to Neural Networks. Forward and Backprop was explained and then a comparison between artificial and biological neurons was made to understand the similarities in design. Python's Numpy library was used to create a basic neural network that used for inputs, the truth table values of a three-input XOR gate and output the value of three-input XOR after learning the GATE. The next lecture focused on a small introduction to Keras by reimplementing the XOR gate in Keras. Then the focus proceeded to understanding data cleaning to work with bigger datasets, in which One Hot Encoding was explained in detail. Gradient Descent was also explained along with a brief introduction to optimization and hyperparameters. The consecutive lecture was on Convolutional Neural Networks in which a gentle

introduction to Pytorch was presented by constructing a CNN to perform image classification in the MNIST dataset. Course material was uploaded to a GitHub repository, which also contains a list of curated deep learning resources.

- **ANTENNA DESIGN:**

Introduction to CST microwave studio is a 4-week course conducted to make the juniors work with an industrial tool. The basic principles of antenna and waveguides were discussed. Juniors were made to design three structures using the CST tool. First, understanding transmission lines and waveguides were done followed by magic tees design in CST. Second, basic antenna parameters were discussed and a microstrip patch antenna was designed for the desired frequency. Antenna parameters were realized using different graphs. Basic concepts on arrays and reconfigurable antenna were also done. Finally, different fabrication and testing techniques were discussed. A mini project was assigned and methods to approach a project was analysed.

- **FULL STACK DEVELOPMENT:**

Full Stack Development course started by teaching students how internet works. Networking was explained to make them know how the data gets transferred between the systems. Chrome Engine was explained to make them get an idea of how browser works. Then we focused on HTML and CSS. Students were able to develop a static portfolio website. We then shifted towards JavaScript. Made them to understand how animation works in browser with help of JavaScript. Gave them tips on how to develop a website quickly for Hackathons. Then we shifted to backend web development. They were explained about Apache Web Server, Application Programming Interface (API), REST Architecture. We then moved to Node.js. Made them understand synchronous and asynchronous programming. Git and GitHub was explained to make them have an idea about industry level software development. We concluded by developing a backend only website (Online Food Reservation App). As the course materials are large, it was shared in drive.

TESLA 3.0

UNDERSTANDING SYSTEM DYNAMICS USING AERO THRUST PENDULUM WORKSHOP:

Objective:
To learn how to understand, visualise and implement control theory and algorithms in real time systems using an Aero-Thrust Pendulum (ATP).
What is ATP? ATP is a bar pendulum designed with a propeller on a BLDC motor shaft at the end of an aluminium suspension freely hanging in a pivot. A digital controller for ATP is designed using FPGA, ARDUINO and STM32 processors to stabilize the aero-thrust pendulum at any desired angle from its natural vertical point.

Uses of the Module: This module is developed to teach control systems in class rooms with practical demonstration.

IMAGE PROCESSING WORKSHOP:

The Image Processing workshop was conducted by Tech Club as a part of the intra-department event, Tesla held on February 4th, 2020. The workshop was taken by Dr N Venkateswaran. In the workshop, the basics of image processing, the various applications of the algorithms and coding of certain concepts was taken. There was a large pool of interested students who attended the workshop and most of them found it interested and enthusiastic about further investigating this domain.

TREASURE HUNT:

One of the popular events amongst the students, Treasure Hunt, was conducted this year promising a brand new outlook. This year's edition was planned with a theme in mind: Exploring islands to get to the Treasure. The game was split into three rounds; upon completing each round a clue to where the treasure's hidden was given. The first round consisted of connecting various pictures given in the clue to reveal a place in the campus. In the second round, participants were given a Meme to guide them to yet another place. In the final round, the participants were asked to choose between two clues in which one of them lead to the trap, asking the participants to go back to the place and collect the other clue to proceed. The clues were theme-relatee descriptions of the place. Upon completing all three rounds, the three clues pertaining to the final treasure must be deciphered to win the contest. Very positive reception from the contestants was received.

EVENT X:

This event was supposed to be the mystery event for the various winners of the other three events. It comprised of a quiz which had both a tech and non tech aspect to it.

HACKERSPACE 2.0

TechClub - Department of ECE collaborated with the Lakshya - the entrepreneurship cell of SSN and organized a 24-hour hackathon -- HackerSpace 2.0. With the purpose of extending last year's Hackerspace 1.0, we organized this year's edition of the hackathon on March 13 & 14, 2020. The primary objective in organizing this event was to introduce hackathons to first-timers by simulating judging criteria that's being followed in some of the best hackathons conducted worldwide. The participants were motivated to take up a problem statement of their choice and solve it within 24 hours using forefront technologies such as AI, IoT, AR/VR, BlockChain, etc., along with a working business model of the product that would be pitched to potential investors. Thirty four teams from different departments participated in this event, with each team comprising 2-4 students.

SPONSORS AND JUDGES:

A fund of Rs. 10,000/- was provided by TechClub, Department of ECE for providing the cash prize for the winners and a fund of Rs. 5000/- was released by Lakshya to help us with generating certificates, purchasing etc. Redbull was also provided to the teams for refreshment. Lakshya arranged for a plausible seed fund from SSN's Innovation Center for the winning team(s), if the product developed was innovative. AltSense sponsored us with Rs. 15,000 worth gift vouchers for all the prize winners and agreed to be the judges for the event. Assisting AltSense in the judging department were a few alumni from Lakshya namely Pratheeshh Kumar, Keshav, Deva Prashant and Kiruthika, and one from TechClub namely Rakesh Vivek, who was TechClub's president in 2018-19.

PREPARATIONS:

Posters were spread two weeks before the hackathon along with the date and the objective. A link to Google Sheets for registration was circulated a week before the hackathon to collect the abstracts and to assess the number of students that would show interest. For this, the TechClub and Lakshya website were modified to include details about HackerSpace. 4 domains were given to students for choosing their problem statement – Agriculture, Logistics, Security and Development. Other domains were also accepted considering the novelty and feasibility. Simultaneously, we booked the CDC for the 2 days and obtained all the required permission letters from the faculty in-charges and the administration for conducting the event. Permissions for the venue, funds, as well as allowing vehicles (of the organizing committee) to enter the gate were obtained. Certificates were printed and the budget was planned.

PROCEEDINGS:

The hackathon started at 12 noon on March 13 and ended at 12 noon on March 14, 2020. 34 teams participated across the all the four years of study from departments like ECE, EEE, CSE, IT and Chemical that worked up to 131 participants in total. After briefing the participants on what is expected out of them and how a Business Model must be presented, regular mentorship was provided throughout the hackathon.

Three rounds of assessment were done:

- First at 6pm on 13th March: The participants were evaluated on four parameters - Idea, Scalability, Impact and Project maintenance by the TechClub members.
- Second at 12am on 14th March: This round was evaluated by Lakshya's passed out seniors on eight parameters - Social Impact, Clarity in thought, KYC, GTM Plan, Sustainability, Return on Investment and an additional parameter.
- Third at 9:30am on 14th March: The final round was once again evaluated by TechClub members, this time with the additional aid of Rakesh Vive. The members went around and simply asked each team to pitch their product in 2 minutes and scored them on two metrics -- technology and business pitch.

Ten teams were then selected based on the scores awarded throughout the night in each assessment. Final presentations started at 1pm and ended at 3:30pm. Each presentation took 10-15 minutes to complete during which the judges from AltSense carefully observed each pitch followed by the product. They scored each team on 6 different metrics -- Social Impact, Novelty of Idea, Scalability, Investment and Revenue, and KYC.

RESULTS:

First -- Tech4Some
Second -- Developers
Third -- Annasan Warriers

IEEE Communication Society Report

The ***IEEE Communications Society Student Branch***, SSNCE has organized an event during the TESLA in the even semester 2019-2020.

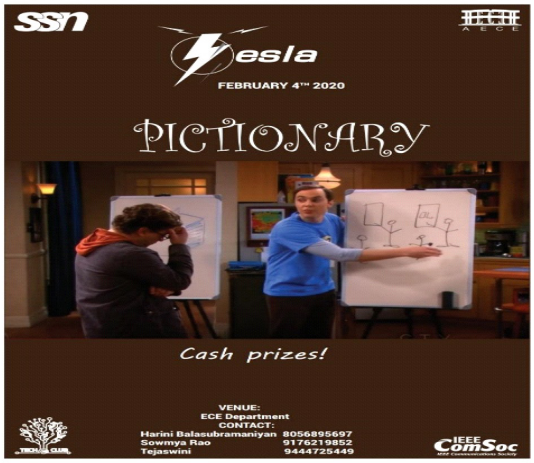
The event was organized by the members of the society and volunteered by third and fourth years students from the ***Department of Electronics and Communication***. The event is ***Pictionary*** and was open to both IEEE and non-IEEE members.

PICTIONARY

An exact mix of technical and non-technical skill display was held as a part of Tesla at the ECE department on the 4th of February, 2020.

The event comprised of two rounds:

➔ First Round:



Nearly 42 teams participated making it a huge success in the first round. This round contained three types of questions: ***picture based questioned, four pictures one word and a crossword puzzle***. Multiple teams consisting of 2-3 people per team were circulated with two different sets of the questionnaire. The interesting part about this event was that *no paper was used*. This event was conducted in such a way that there is no unnecessary use of paper. The sets containing the questionnaire were sent to the participants emails. Each team competed with the other teams based on number of correct answers. Various teams across the departments had parti067600cipated in it. The first round tested the basic engineering knowledge and non-technical information each team was equipped with. ***Five teams*** successfully *cleared the first round* making it to the second round.

➔ Second Round:

The second round was a fun round which maintained the vibrancy of all the five teams equally. The second round was '***Pictionary'***. A set of words both technical and non-technical were written and each team picked one out of the lot. Some technical words that were a part of the list are Impedance, oscillator, microwave, buffer, and router. Based on their convenience, they chose the order of the words and represented it visually. Each team came up with very creative ways of representing the respective word. The team that guessed maximum words in a one minute time limit were awarded with more points. This was a cheerful round and all the teams had given their best. ***Three teams*** bagged the *cash price*.

The whole event was a huge success. Although many people volunteered for the event, it is worth mentioning the important students because of whom the event was very successful:

- Sowmya Rao,
- Tejaswini Panati,
- Supriya D,
- Harini B

- Harini Balasubramaniyam,
4th year, A

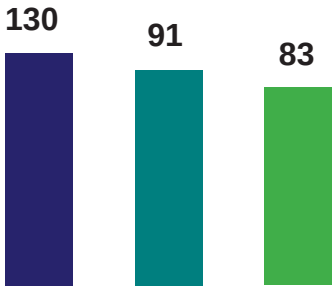
AECE REPORT

Association of Electronics and Communication Engineering was inaugurated on August 6, 2019 by Mr. Vengatesan Natarajan from Alcatel Enterprises where the prefectorial body for that academic year were formally designated. AECE mentored the all events organised during Invente, the annual two-day Techfest where a total of 917 students participated. Invente inauguration activities and all registration procedures for all events were supervised by the committee. ECE department contributed to the highest number of registrations.

For the department events a fitting theme “Space” was chosen to parallel with the Chandrayan Mission by ISRO. On Day 0 of Invente, a variegated group Photograph along with the staff members and students of the department exhibiting various theme orientated decors organised for the event. For the coordinated events Mr.Cooper, Mad Street Den were solicited as Sponsors. Prize-winners for various events conducted in the department were given Internship opportunities by the sponsors themselves. In collaboration with its Sister organisation Tech club, Corona an intra collegiate Tech fest and Tesla an intra college symposium with various events were planned and organised.

PLACEMENT REPORT

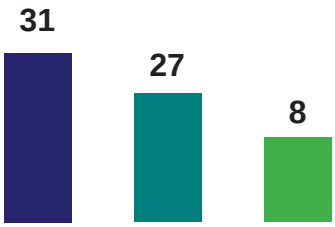
U.G.



No. of companies visited : 116
Total no. of offers : 122

Average CTC : 5.4 LPA

P.G.



No. of companies visited : 34
Total no. of offers : 9

Total no. of students registered
Total no. of eligible students
Total no. of students placed

Super Dream Companies:

- NAVIS
- McKinsey
- ClariTrics India Private Ltd.
- Goldman Sachs
- Citibank
- Paypal
- Google
- Accolite Software Pvt. Ltd.
- Thorogood
- Viasat
- Think & Learn (BYJU'S)
- Commvault
- Jaro Education
- Avalara Technologies

Students placed in Super Dream Companies:

Sanjana Ganesh
(Citibank) - 13LPA

Nandhini K
(Citibank) - 13LPA

Aishwarya Narayanan
(McKinsey) - 10LPA

M. Purvaja
(Citibank) - 13LPA

STUDENT'S CO-CURRICULAR ACTIVITIES

- *Mr. Vigneshwar Veeravagu* & *Mr. Vishal Mohan,* UG-Mech*, Ms. P. Tejaswini* & *Ms. I. Sai Deepika*, UG-ECE 2017-2021 batch, *Ms. NJ Raksshitha* & *Mr. Hashmat Jeelani Banday*, UG-EEE, *Dr. S. Sakthivel Murugan*, Asso. Prof., *Dr. R. Vimal Samsingh*, Asso. Prof./Mech, *Dr. K. Murugaesan*, Asso. Prof./EEE, presented a poster titled **"Prototype of Inspection Class Remotely Operated Vehicle"** in the 2019 International Symposium on Ocean Technology (SYMPOL 2019) held at Cochin University of Science and Technology (CUSAT), Cochin from **11th to 13th Dec. 2019.**

- *Ms. J. Renita*, RS attended a training program on **"Side Channel Analysis and Countermeasures"** organized by Society for Electronic Transactions and Security (SETS), Chennai from **22nd till 24th Jan. 2020**.

- *Ms. S. Kiruthika*, JRF, working under the guidance of *Dr S Radha*, Prof & Head, received the **BEST ORAL PRESENTATION** award during **SSN DOCTORAL Research Day 2020**. She was also shortlisted for the award of CSIR SRF fellowship. She also received the **"Innovative Researcher in Multifunctional Sensors"** in the International Research Leadership Award Sponsored by the International Research Councils held on **26th January, 2020** at Grandeur Hall, Hotel Breeze Residency, Trichy, Tamil Nadu.

- *Ms. G. Yogalakshmi*, PG-CS 2018-2020 Batch, completed internship on **"Microwave Filters"** at Keio University - Shanon Fujisawa Campus, Fujisawa, Japan from **7th Jan. 2020 to 7th Feb. 2020**. She received 6,20,000 Yen as stipend during the internship period. *Dr. Jin Mitsugi*, Keio University and *Dr. R. Kishore*, SSNCE coordinated the internship programme.

- *Dr. R. Vimal Samsingh*, Asso. Prof./Mech and *Dr. S. Esther Florence*, Asso. Prof. mentored two student projects for **"Hacksagon - A National level Project competition initiative"** conducted by Atal Bihari Vajpayee-Indian Institute of Information Technology and Management, Gwalior, Madhya Pradesh in collaboration with 5 others IIITs. The two teams have been selected for the final round after clearing **round 1** on **March 3, 2020** and regional centre presentations for **round 2** on **March 28, 2020**. The project details are:
    - *Mr. Hemanth Kumar* & *Mr. Aravindhan*, III Year/Mech on **"Security and surveillance using battery operated vehicle"**
    - *Mr. Naveed* & *Mr. Pranav*, II Year/Mech and *Mr. R. R. Mouliswar*, IV Year/Mech on **"Geo-fencing and wet monitoring belt for babies"**

- The team consisting of 1st year students *Sree Harine Govindaraj*, ECE, *Sabesh Bharathi*, CSE, *Sandhya B*, ECE, *Santhosh Srinivas*, ECE participated in 4-day COVID Hackathon Challenge organized by IEEE India Council and **won second prize** in **IEEE India COVID MOVE Online Hackathon Challenge.**

- Team **Medtex** consisting of students from BME and ECE (*Sai Kavya Neharika M C*, BME; *Lokesh Kumar*, BME, *Sakthivel Sukeerthi*, Medical Electronics & *Shwetha S*, ECE) took part in the **IEEE Covid Hackathon 2.0** and **won the first place** under the mentorship of *Dr. B. Geethanjali*, Asso. Prof./BME.

- *Ms. Chetana*, (UG-BME 2018-2022 Batch) presented the project titled *"Detecting the lung disease using breathing rate"* in **IEEE student project funding** for the year **2019-20** under the mentorship of *Dr, N. Edna Elizabeth*, Prof/ECE and **won second place** with the cash prize of Rs. 5000/- on **8th May 2020**.

- *K. Hariharan* (Class of 2021) has been appointed as '**Student Representative' for IEEE Madras Section** for the year **2020**.

Italy Internship

Collaborative relations exist between the University of Catania, Italy and our college since the past 5 years. Every year a number of third year students opt to go to the University of Catania to gain better experience in their fields of interest, including IOT, microwave imaging, wireless communication, etc. The internship is sought after by those who wish to undertake higher education after their B.E. This conversation records the experience of two out of eight students who went to University of Catania in the year 2019 for an internship. Currently fourth years they were highly enthusiastic about sharing their experiences with the juniors who might like to visit the country for an internship (of course, after this tragic period of quarantine ends). Here is an excerpt of the conversation we had with Barath Kumar(ECE-A) and Shruthi K.(ECE-B).

What was your motivation to opt for foreign internship in Italy?

Barath: I have been to Jordan for research internship before, so, I know what difference does it make to have a foreign internship to show for in a resume. As a result, when I heard about the Italian internship from our faculties, I took the decision immediately to go for it. I knew the exposure would prove to be extremely helpful in future.

Shruthi: The benefits are obvious. I heard about the internship from Dr. Prabhagaran and I knew I was definitely interested.

What are the areas of research available for you to work in? Also, why did you chose a particular domain?

Shruthi: There were eight problem statements proposed by seven different professors from University of Catania. All the eight of us negotiated and picked one each. I picked Microwave imaging as I am inclined towards Electromagnetic theory.

Barath: I had worked in wireless communication in a previous internship. So, I decided to go for IOT as the given problem statement was a combination of wireless communication and IOT.

Can you please describe your experience in University of Catania?

Shruthi: The University provided us with a laboratory to work in outside the campus. It was easily accessible through metro and metro shuttle. The work hours were flexible. Professors would come to check on us once in a day but they were always available digitally. All the professors were obliging and understanding. Inspite of the language barrier, professors did their best to make us understand the concepts and clear our doubts.

Barath: The University even provided us passes for free conveyance within the campus. As Shruthi said, all the professors were very kind and did their best to help us. Professor Giovanni Schembra was one of those very helpful professors. He informed people that we needed to be taken care of well. He had visited our college for Wispnet conference before.

How did you manage with the accommodation and conveyance?

Barath: Six of us including me lived in an two bedroom apartment. We pre-planned everything so it was all great. The apartment was fully furnished and all the basic kitchen equipments were there. There were even two television sets. There was a coffee machine and the house owner was kind enough to explain everything to us the best he could, considering the language barrier. He gave us a brochure depicting all the nearby grocery stores. He even paid for the electricity, wifi and gas himself.The stay was very comfortable.

Shruthi: I lived with two other people in an Airbnb apartment. It was comfortable. The tickets for the trip were booked with the help of a tourism company. It was all rather well planned.

What were the placed you visited in Italy in the course of the internship? Which one was your favourite and you would recommend?

Shruthi: I travelled through most of Southern Italy, Rome and Venice. We managed to go to all the places during the weekends or such, thus not affecting our work. I would recommend a day in Siracusa which is an hour away from Catania. The city is a vibe by itself and the beaches are beautiful.

Siracusa city

Mount Etna

Barath: We made sure we visit one tourist spot every weekend. We had eight weekends, so we went to various places. The places we visited were Taormina beach, Siracusa, Rome, Vatican city and Venice during one weekend, trekking in Mt. Etna during another weekend, Aci trezza, Catania beach and a few other places. My favourite would be the Mount Etna trip. It was a very different experience and Etna being a active volcano, you could actually see the frozen lava all around. I would definitely recommend visiting Mt. Etna.

Can you please explain your experience with the people in Italy?

Barath: The Italian people were amiable. As I said the fellow researchers there were caring and treated us really well. They even gave us a good farewell. The workers in train station and restaurant were very patient with us and helped us a lot.

Shruthi: Most of the people talk only Italian, so we didn't really have a chance to bond with them. But in general they were quite helpful. But look out for some rare casual racism, too.

How much of a difference does it make not knowing Italian?

Barath: Not knowing Italian will make a huge difference because general public never speak English. Inside the university, campus you can manage with English but in the city its difficult. So I recommend students to learn at least basic Italian before they go.

Shruthi: Your work won't be affected. But I personally feel like I missed out a lot of experiences because of the language barrier. Buying groceries and food from restaurants was made easier by Google Translate.

Shruthi K.(ECE-B)

What would you recommend the new interns learn beforehand for the internship?

Shruthi: How useful this internship turns out to be, truly comes down to what you make of it. Try your best to get as much work done as you can while you're in Italy itself as once you're back you'll have a lot to catch up on. Also invest in this internship only if you're into research and higher studies in ECE.

Barath: They need to go through the topic given to them and equip themselves with basics on the topic of research before they go there. Learn basic Italian. Plan beforehand the places they would like to visit and the budget for it too and the cost of the tickets. It will make it easier to coordinate in Italy and won't be entirely new to them. Figure out earlier what the necessary items they might need to carry for the trip are. Make sure to keep just the essential clothes (you have laundry service there) and more of the food ingredients you might need while cooking.

How would you describe the most difficult experience for you in Italy?

Shruthi: I wouldn't say the most difficult but the most challenging experience was building an independent lifestyle. I had to cook, clean, work extensively on the project all without the pressure of deadline or a person. Also, learning how to talk-to-communicate over talk-to-impress as knowledge of English is pretty scarce in Italy.

Barath: To me we never faced any difficult situation in Italy, because we planned everything well before leaving. One instance, though, would be when some of our bags got misplaced during our arrival in Italy. So we had to contact the airlines and sort it out. It took us three days to get our luggage back. But overall the Indians there guided us in all aspects.

Barath Kumar(ECE-A)

Cost for the trip as mentioned by Barath

Rs. 1,60,000 per person
Flight: Rs. 75,000
Accommodation: Rs. 34,000
Travel and tourism: Rs. 25,000 approx.

- Shreya Gaur,
3rd year, C

Smart India Hackathon 2k19

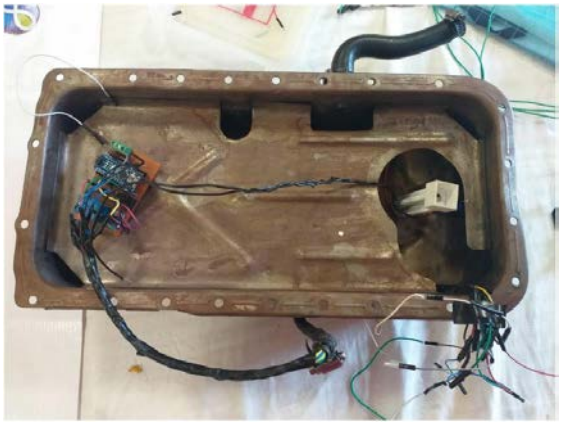
One of the biggest hackathons of our country is the Smart India Hackathon.All India Council for Technical Education (AICTE) under the Ministry of Human Resource Development (MHRD) and in collaboration with MIC, i4c and Persistent Systems organized Smart India Hackathon (SIH) 2019. With 96 industries and 18 Central Government Ministries and Departments, SIH 2019 was much bigger than its previous editions. It included 2 sub-editions – Software edition and Hardware edition which were held in different locations. The Smart India Hackathon aims at tackling a plethora of problems faced by industries in real time. Every year, students of our college always rise to the challenge and triumph.

TEAM INFINITY CLONES

One such team was Infinity Clones, a team of students from the Departments of Electronics and Communication Engineering and Chemical Engineering who were the winners of SIH 2019-The Hardware Edition held at Pune. The team members are: M.P.Shwetha, D.P.Sharavanee, R.Kirthana, Aparajith Srinivasan, S.Suryaprakash, S.Surendran. We spoke to Shwetha, Sharavanee and Kirthana to be regaled by their experience with SIH.

Generic methods of checking the health of engine oil like using a dipstick or their hands are inefficient and lead to waste of oil; there are also several common misconceptions about judging the health of the oil. To tackle this issue there was a problem statement given by TATA Motors under the title 'Vehicle consumable prognostics'. Starting out with the ideas of testing the viscosity and conductivity of the oil, the team then went on to tackle the problem by testing the opacity instead of the viscosity by the use of an LDR-LED combination after many experiments. The team was asked to demonstrate live using samples that were given to them to prove their hypothesis.

Infinity Clones team *- SSN*



One could hear the nostalgia in their voices as they described their first hackathon experience. Held at IISER Pune, they had the best facilities available as they were also close to NCL and ARAI. From accommodation to faculty, it was truly brilliant they said. The organizers at IISER pulled out all the stops to ensure that the participants had a good time. The head even lent them his car! Their mentor Dr Jino Hans from ECE as well as the mentor from TATA Motors were always there providing support. During the course of the hackathon they went through several stages of evaluation and even had the opportunity to display their projects to emminent personalities such as the heads of AICTE, TATA Motors and ARAI. After 5 exhilarating and sleepless days they finally emerged victorious and won the competition.

They all felt that it was an amazing learning experience and that they got a lot pf exposure. They were able to understand the needs of today's industries and learn how to develop and market projects for the same. One of the most important things they learned was that industries did not expect complex solutions rather they expected simple solutions for their complex problems. As far as this particular project is concerned, it is now an internally funded project and they are now in talks with TATA Motors to make it an official project with them.

- Pabbichetty Nimisha,
2nd year, B

TEAM TECHDOCS

In this initiative to inculcate a culture of innovation, another mixed team from Electronics and Communication Engineering (ECE) Department and Biomedical Engineering Department (BME) Department bagged the first prize in the hardware edition of the hackathon.
The team comprised of Saikiran S (III), Sriram V (III), Sabharish P (III), Vishaal Venkat (III) from ECE Dept. and Suhashine S (III), Varshini V (II) from BME Dept. They are all currently in their final year of engineering except for Varshini, who's a third-year student. They were mentored by professors Dr. Geethanjali B and Dr. Mahesh V from BME Dept. The hackathon was held at Bharath Skill Development University, Jaipur for 5 days. The problem statement addressed by the team was the development of a Continuous Non-invasive Blood Pressure Measurement Device.

The team felt that the development of such a device was important as blood pressure is one of the vital signs, along with respiratory rate, heart rate, oxygen saturation, and body temperature. The initial prototype that they designed was modified progressively to make it more suitable for real life applications. At its later stages, the prototype had been fine-tuned to perfection. This was despite the challenges that the team faced which included difficulty in obtaining components and the lack of a laboratory setting before the finals.

All the members in the team were assigned tasks based on their strengths and during the hackathon the mentors and the team were fully occupied. On each day of the 5-day hackathon, a review was held by the industry experts and judges. The team worked efficiently to implement their suggestions. One of the reasons for their success was the effort to improve their device. They worked tirelessly both before and during the hackathon to polish their product.

One of the team members, Saikiran remarks, “It was one of the best experiences of my engineering life both professionally and personally.” He hoped that more juniors would participate in this competition and put their best foot forward!

- Shwetha S,
2nd year, C

ALUMNUS SECTION

A Conversation With Taruna Sudhakar, CMU

Taruna Sudhakar is a final year graduate from our ECE department who has a keen interest for Robotics and Image Processing. Thanks to her hard work and perseverance, Taruna was admitted to the prestigious Carnegie Mellon University for a Master of Science degree in Robotic Systems Development. Here, we the Impulse magazine team catch up with Taruna as she recounts the journey that led her to her dream university. Read on to know more!

Andrea: ***Robotics is an incredibly vast field of study. What got you interested in this field?***

Taruna : I was introduced to the field of Robotics while I was still in school, and I was fascinated by the subject. I had a desire to pursue Robotics back then. However I was quick to realize that it wasn't as simple as it seemed and decided to explore other fields before I could make a decision. I tried my hand in Image Processing, Computer Vision, Signal Processing and even Machine Learning for a bit before I realized Robotics would be perfect for me. Robotics is an amalgamation of many different fields and I love the diverse opportunities that come with it.

Andrea: ***What made you choose CMU against all other offers you received?***

Taruna : The Robotics Institute at Carnegie Mellon University is considered to be the best in the world. It is a pioneer of Robotics research and houses an incredible scientific community . If I was going to pursue Robotics, I knew I had to do it at CMU. I had gotten admits for an MS in Systems Engineering (UPenn, UMaryland), an MS in Electrical Engineering (GaTech, USC), but I picked CMU because I wanted to explore the field of Robotics. The thought of studying the subject I held such a huge fascination for, at such a reputed university, and being amongst some of the brightest minds in the field is what attracted me.

Andrea: ***How did you start building your profile for your MS admissions?***

Taruna : My CGPA was pretty low in comparison to my peers, and so I thought my chances of getting into any top university, let alone CMU, was pretty slim. Seniors I had spoken to, who had done their Masters in such universities generally had an impressive academic record, and this was very demotivating to me. Moreover, by the time I'd decided I wanted to pursue an MS, I had very little time to improve my CGPA for it to make a difference. So I took it upon myself to improve my all round profile to make up for this. I worked on projects and research papers and made sure they were

all worth mentioning and made sense as part of the narrative I needed to convince any Admissions Committee that I was a competent candidate for their program. Needless to say, this worked in my favor.

Andrea: ***Describe some of the projects you worked on. How did they help you in the long run?***

Taruna : I worked on projects and research papers in different fields during my four years as a college student. The internally funded project I worked on focused on Computer Vision. My internship at IIT-Madras focused on Medical Image Processing. I worked on a research paper on Microgrid Optimization which I, along with my teammates presented at a conference in Seattle. Apart from that, a classmate and I worked under Venkateswaran Sir and published a paper in the field of Image Steganography. Although I did find myself doing a little bit of everything, instead of focusing on one specific field, I believe that's what helped me realize that Robotics could be a great fit for me.

Andrea: ***How important are one's SoP, LoRs, GRE and TOEFL scores while applying to universities?***

Taruna : The most important part of your SoP is building a convincing narrative that shows you are a strong candidate for a certain program. With each project I did, I learned something new and gained practical knowledge in that field. I highlighted these successes and learnings in my Statement Of Purpose while also being honest about my shortcomings and failures. It is helpful to consider every failure as a jumping off point for self-improvement. Admission Committees appreciate honesty and resilience rather than artificial perfection. They read through thousands of applications and can tell when you're being genuine and when you're not. Your SoP should also cater to the program objectives of the course you would like to pursue at that particular university. Talk about your technical journey that got you to this point, without overstating the facts. Remember, it is your Statement of Purpose, and you should be the only one who is writing it. Plagiarism of any form is not entertained in any university, and frowned upon. As for Letters of Recommendation, get your LoRs from professors who've known you well and are likely to give you a strong recommendation. The content of the LoR really matters.

As for GRE and TOEFL, both these exams are relatively easy, and with the right amount of effort one can easily score well. Although not a deciding factor, it does surely help to have good scores, especially if your CGPA is lacking.

Andrea: ***Finally, what advice would you like to give any MS aspirants reading this?***

Taruna : To the many MS aspirants out there, I'd like to say:

- Don't be discouraged if your CGPA isn't as high as what is expected. You can always turn your situation around if you want to and put your mind to it.
- Go the extra mile with the projects and research papers you work on. Don't be afraid to learn something new.
- It's always better to know that you were rejected rather than not apply to ambitious universities at all. You never know if you never try!

- Andrea Solomon, 2nd year, A

INDUSTRY INSIGHT

DELOITTE.

As we know, Time never stops for anyone. It is always up to the person to squander time or use it effectively to improve their skills and knowledge. As you approach the end of your graduate degree program, it is essential that you have a plan or a goal on what to do next. Well, career aspirations are an important factor. If you have nailed it down to take a job after college, then you're at the right place. Being in a country that churns out around a million engineers every year, the competition is very high for the jobs that are being offered. Moreover, this year there's definitely going to be a big hit to all the people who are taking placements as the job offers will be less. Covid-19 has dropped the world economy and therefore every company is trying to cut down the pay of their current employees. Therefore, in this situation, it is necessary that everyone is well prepared and makes use of time efficiently.

Many people want to get placed in a *Dream or a Super Dream company*, but they're only going to select a small minority from a pool of vast majority. Most of the time, you aren't clear about the specification of a particular company. Besides, some people are good academically that they ace the aptitude but lack the other qualities the company expects. When you are ready to begin your job search, first you must know the different stages in the job search process and where you are in each of the stages. This includes preparing a resume, Group Discussions, Interviews and most importantly equipping yourself with the appropriate skills. Planning and preparing for a job in advance is the key to successful employment. This is the SMART MOVE that ought to be taken by a job-seeking college pass-out like you to land your DREAM JOB.

Deloitte.

Here we're going to take an example of someone who is now working at ***Deloitte*** for more a year now to share his experiences and his journey from entering into Deloitte up until now.

I interviewed a person from Deloitte who passed out of college in 2018 from Sri Venkateshwara College of Engineering. His name is Sudharshan and he is currently a Cybersecurity Consultant at Deloitte. His Job title is to audit banking applications, do a white box hacking and report vulnerabilities, review source code to find potential security flaws, review the Network architecture of the application, provide measures to strengthen the same, review the encryption standards used by the database and check the channel encryption for secure data communication, etc.

Before you go any further, Deloitte is a multinational professional services network. Deloitte is one of the ***"Big Four"*** accounting organizations and the largest professional services network in the world by revenue and number of professionals with headquarters in London, United Kingdom. Deloitte provides audit, tax, consulting, enterprise risk and financial advisory services with approximately 312,000 professionals globally. Deloitte is more of a knowledge-based company more than the

CPGA but nonetheless, CPGA is also considered. ***"Though CGPA is important, this alone does not carry any weightage in terms of getting a job because the relevant skills should be needed to work,"*** says Sudharshan. Besides, Deloitte provides an average salary of around 5-7LPA for individuals and passed out students. In addition to that, Deloitte also intakes around 4-15 people but this is not static as the requirements also depend on location, project requirements, skillset, etc.

So, this job offer for the position of Cybersecurity Consultant was applied by him off-campus through Deloitte's career page. This was not a part of the campus placements and therefore his LinkedIn profile page mattered a lot. So, the first round of interview was over the telephone. Not to mention, Sudharshan has also completed an online course on Networking by Cisco. The telephonic interview had questions that were related to the projects, achievements that he had mentioned on his resume and it lasted for about half an hour. He had to explain all the projects he worked on in detail to enter into the second round of interview. Secondly, the next round of the interview was at the corporate office and the questions were related to cybersecurity, attack vectors, known tools, and programming languages. Since he has successfully answered all the questions related to Cybersecurity and other mentioned topics, he had cleared the round successfully. Later, the subsequent procedures started as he was successfully into the company as an employee. ***"I accepted the offer because I was looking to work in the field of cybersecurity and the job profile was exciting as well. It was the area of the job that made me accept the offer and as far as the salary is concerned, it varies for each person."*** says Sudharshan. Well, even though this salary was decent, he took the job because he was genuinely interested in this domain and he wanted to learn as much as he could which would improve his knowledge and correspondingly will increase his salary in the future too.

A piece of advice from him to all the future aspirants is that ***"The situation now is such that everyone needs to code. If not code, at least to read and understand what it does. Apart from coding knowledge, obviously domain-specific skills will be required and having a somewhat detailed knowledge will surely be of great help in the long run because you never know what the interviewer might ask"***. Thus, it is important to learn a little deep in whatever domain interview you are going to be attending in the future. Also, it makes sense to do a little research on what the company's job title and position are so that you'll know what to expect. Also, it would definitely impress the panel too. Next up, coming to the workspace, comfortability and leisure activities, as you would expect the company has Team lunch and outings which are conducted at regular intervals. But since the company is audit based and the work mostly relies on being with the Client, business formals is the default dress code. Coming to leisure activities, the company does conduct fun month-end sessions and celebrations for all major festivals, take place too.

As the last part of the interview process, I asked him about any fun experiences he had confronted in the company. He said, ***"We have a big team at the client location and some people leave their laptops unlocked. We use this opportunity to send fake resignation mails to our manager lol, but our manager is chill so he knows that it's a prank"***. It is essential to have a little fun in the work environment to always get yourselves to relax from the work stress and this is clearly evident above. Last but not the least, a few disadvantages he has been facing are, due to time constraints or workload, he has to work extra shifts. This has cost his personal time and it is always important to maintain a good work-life balance. In conclusion, I would like to end on an important note that the world does not stop for you, so keep running until you catch up the people around you or until you live up to the expectations of your dream company.

-Anirudh L

3rd Year, A

TAMILNADU PUBLIC SERVICE COMMISSION

I'm going to share my experience of interviewing a HR working in the **Public Service Commission of Tamilnadu**. As a professional working in an esteemed community, he shared his experience on entering into the institution including the difficulties he faced and how he overcame them. He also spoke about the workplace atmosphere and his co-workers.

He entered the institution after clearing Group 2 Combined services exam and was allotted in the employee management section. Since it's a new institution and as a newbie, he expected someone to guide him through the process initially but unfortunately he found no one. So he decided **self learning** was the best option. One thing he stressed on is that **self interest is very important**-one must never hesitate to ask for something he doesn't know, stay open minded and most importantly be open to suggestions. He found it essential to update himself accordingly in order to survive in the institution.

The major goal of any employee should be to develop the institution. He also discussed the problems he faced such as voluntary misleading of employees, the ego clashes between co-workers, the decision clashes with the higher official, etc. He addressed that the solution to many such problems is to follow team bonding, co-operation and encouragement in the workplace between the individuals. If not for joining here he would have joined an electrically inclined core institution. But his passion and interest greatly paid off for he is now very successful at his job. Hence his kind note to the students is that they should take the profession in which they are passionate and interested in.

As **Oprah Winfrey** said :

"Passion is energy. Feel the power that comes from focusing on what excites you".

- Nivedha Sankaran

3rd Year, B

STUDY CORNER

Conversation on

DISEASE CONTROL IN AGRICULTURE

with ***Dr.R.Hemalatha, M.E., Ph.D***

Agriculture is the backbone of our country and its economy. It contributes around 16-18% of India's GDP (2018), and provides employment to about 60 % population. In recent years, there has been a global climate change which had a great impact on the Indian agriculture. As agriculture struggles to support the rapidly growing global population, plant diseases on average account for 42% loss of the production of the six most important food crops including paddy.We have got valuable inputs for this section from our very own staff, Dr.R.Hemalatha, Associate Professor, Department of ECE and we thank madam for the same.

Indhuja U S: ***Can you give a brief introduction on the importance of disease control in agriculture?***

Dr.R.Hemalatha: The agricultural production has to grow rapidly to feed India's fast growing population. But, pests and plant diseases stand as a hurdle in the path to achieve higher agricultural produce. The diseases are mainly due to fungi, viral and pest-based infections. Farmers spend large amount on disease management, often without adequate technical support, resulting in poor disease control, pollution and harmful results. In addition, plant disease can devastate natural ecosystems, compounding environmental problems caused by habitat loss and poor land management. Hence disease management and control plays a vital role in agriculture.

Indhuja U S: ***What are the main crops you are focusing on and what are the diseases/pests under consideration?***

Dr.R.Hemalatha: At present, we are concentrating on Hill Banana and Paddy.

Banana has occupied one of the top positions in India's booming fruit industry with an annual production of 13.5 metric tons from an area of 4.0 lakh hectares. Hill bananas, which are unique to the state of Tamil Nadu, are known for their special flavour and long shelf life. It is an economical crop for the farmer in the hilly and tribal areas of Pulney (Palani) hills in Tamilnadu. It has loads of nutrients packed in it that triggers your body to maintain excellent health. However, hill banana is severely affected by a specific viral disease called bunchy top. This has nearly made it an endangered species. Hence, it isessential to take counter measures to overcome the disease. The major diseases that affect the hill bananas are Banana bunchy

top and Sigatoka leaf spot. The pests are Banana Aphid and Pseudo stem borer.

Paddy (Rice) is the staple food of India. Tamilnadu comes under the top 10 rice producing states. Paddy is the principal crop extensively cultivated in all the districts of the state having a unique three-season pattern.
The diseases affecting paddy are rice blast, bacterial blight, sheath blight and brown spot. The major pests are green leaf hopper, paddy stem borer and leaf folder.

Indhuja U S: ***What are the different methods used for disease control currently?***

Dr.R.Hemalatha: It includes manual monitoring, automated systems and expert contact.

Manual monitoring is difficult task, less accurate and can be done in limited areas only. In few peculiar cases, the actual cause of the disease could not be identified and even the farmers rely on experts in the field for confirmation and further action. *Automated systems* are developed for irrigation control and environmental monitoring in the field. *Expert Contact* includes KVK (Kishan Vikas Kendra's) and WhatsApp groups, wherein decisions and solutions are provided by agricultural experts based on the specimen or photos of the diseased plants respectively.

Indhuja U S: ***Other than those currently existing, what other technologies/methods can help farmers to control disease?***

Dr.R.Hemalatha: Automated Visual monitoring systems, Drone based analysis, Sensors for identifying the underlying biological/chemical reaction that paves way for the diseases and prediction of weather, environmental and infectious conditions (based on satellite imagery) well ahead to ensure appropriate countermeasures.

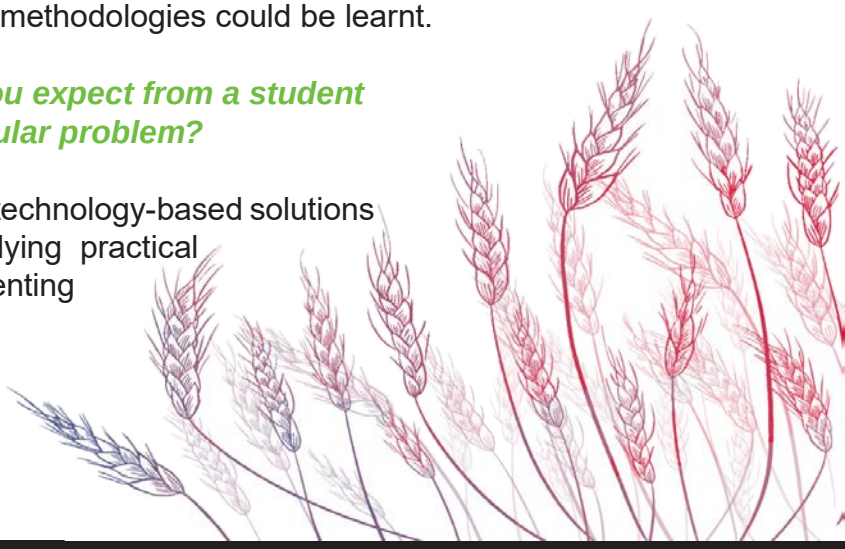
Indhuja U S: ***If a student wishes to work on disease control, how does he/she get started?***

Dr.R.Hemalatha: Basic understanding of the staple crops in the country, their diseases, conductive environmental conditions that trigger them and the remedial measures to combat the same is essential. They may narrow down into either Hardware or Software domain based on their interest.

The hardware domain includes data acquisition and transmission through WMSN, formulating strategies to enable efficient data acquisition at lower cost, design and validation of the hardware setup and sensor development (identifying the associated chemical/biological reaction that leads to diseases). The software domain includes devising an efficient image processing algorithm to identify the diseases in the plants, mobile app development for decision making and cloud/server based processing.Based on the area of interest, the requisite languages and processor / sensor acquisition methodologies could be learnt.

Indhuja U S: ***What are the pre requisites you expect from a student who wishes to work with you in this particular problem?***

Dr.R.Hemalatha: Being aware of the need for technology-based solutions for agricultural applications and their underlying practical difficulties is essential. Designing and implementing a disease detection system involves the following methodologies, Field Study,



Data Acquisition and Transmission(Sensors,BLE/ZigBee/LoRAWAN/4G), Efficient Network Formulation(Optimization and Localization methodologies), Data Processing and Classification(Image processing, Machine learning),Decision making (App development, Cloud /Server based Processing) and Drone based processing (Path optimization, customising drones).

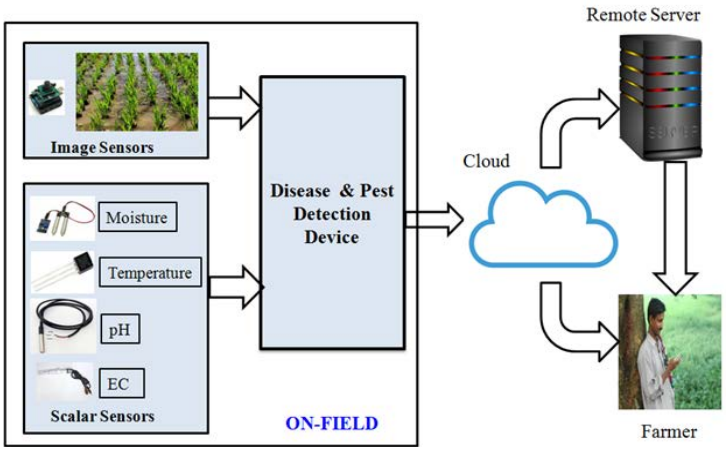
So, the prerequisite is the knowledge of basic programming language and zeal to learn and adapt to the requirements.

Indhuja U S: ***Can you give a brief introduction about your projects in disease control?***

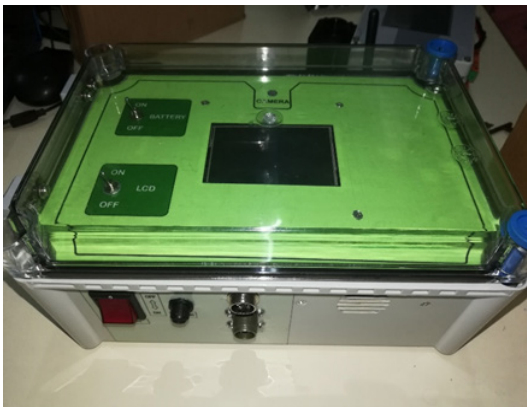
Dr.R.Hemalatha: We were initially working on WMSN (Wireless Multimedia Sensor Networks) and compressed sensing to ensure energy efficient image transmission over wireless sensor networks. Later on, we thought of applying the same to overcome societal problems. Hence, we concentrated on agricultural applications.

At present, we are working on the project titled "*Development of an Efficient IOT Enabled Plant Disease & Pest Detection System*" funded by DST SSTP for about Rs. 62.26 Lakhs. This project is implemented in collaboration with National Research Centre for Banana (NRCB), Trichy.

This project deals with developing an efficient and affordable plant disease and pest detection system. The system can be deployed in real-field. It will monitor the entire environment on a scheduled basis and sense the requisite details. The sensed data will be analysed and if there are any deviations from regular symptoms it will be suddenly notified to the end user. The same will be processed further and the remedial measures will also be notified. The parametric monitoring and image-based analysis is performed to ensure early detection of diseases, pests and identification of the favourable conditions for the onset of diseases and pests. It is done through sensors and cameras attached to Raspberry Pi3 and TMS 3200 kit. The sensed parameters are uploaded to the cloud as compressed measurements to reduce the transmission and storage
complexity. The final classification will be done at the server end and remedial measures will be suggested through field expert to the farmers via Mobile App, SMS or WhatsApp indication.



Overview of the system to be implemented under the project



Prototype of the sensing unit

We have also implemented and tested a basic system for monitoring cucumber plants in greenhouse. We are also working on developing a LoRA WAN based disease monitoring system, exploring the possibility of using drones for plant health monitoring and customizing drones for agricultural application.

Indhuja U S: ***Do you suggest any reference material or websites for students to explore various innovations with regard to disease control?***

Dr.R.Hemalatha: For recent methodologies for disease detection students can refer,
"Kashyap P.L., Kumar S., Jasrotia P., Singh D.P., Singh G.P. (2019) Nanosensors for Plant Disease Diagnosis: Current Understanding and Future Perspectives. In: Pudake R., Chauhan N., Kole C. (eds) Nanoscience for Sustainable Agriculture. Springer, Cham"

https://patents.google.com/patent/WO2017194276A1/en
https://newatlas.com/plant-dna-microneedles/60053/
https://fasal.co/

For disease details, the following materials can be referred

http://nrcb.res.in/technology-portal.php
http://agritech.tnau.ac.in/crop_protection/crop_prot_crop%20diseases_cereals_paddy.html
http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_insectpest%20_cereals_paddymain.html
http://agritech.tnau.ac.in/horticulture/horti_fruits_banana.html

Students who wish to explore more about this topic can feel free to contact Dr.R.Hemalatha in the ECE department during college hours.

- Indhuja U S,
3rd year, A

*An Interview with **Dr. W. Jino Hans** on:*

NIGHT VISION

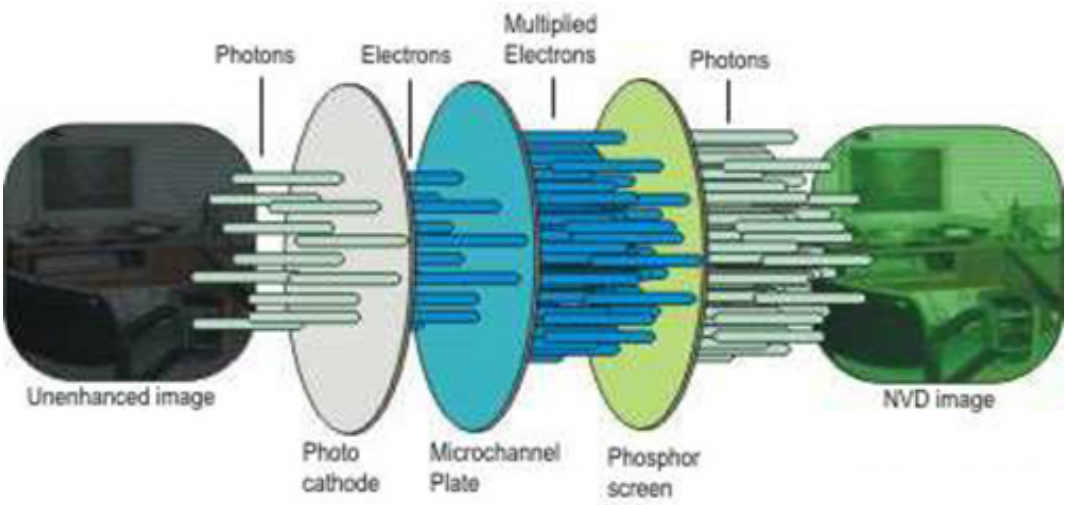
It is fairly easy to deduce what "*Night vision*" means, given its obvious moniker. Avid gamers, movie buffs and military aficionados would be quite familiar with the technology that enables vision in low light conditions. Night vision has come a long way considering it originated during the second World War. It has applications that extend beyond the military, an obvious one being the navigation in autonomous vehicles. To shine some light on this field, we spoke to Professor W Jino Hans who has taken up research in this domain.

Shwetha S: ***What are the basic principles behind night vision?***

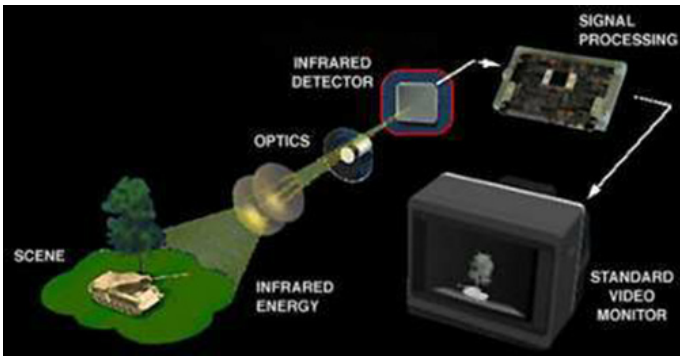
Dr. W. Jino Hans: Night vision helps humans to see in low-light conditions. Night vision technologies can be broadly classified into three, viz. image intensification, active illumination and thermal imaging technology.

- Image intensification technology magnifies the number of photons received while capturing a scene in low light conditions. It can be used in low light cameras and goggles.

- Active illumination technology integrates the image intensification technology with an active source. The active source can be a source that provides active near-infrared illumination with a spectral range of 700-1000 nm (just below the visible spectrum). The resulting image will be monochromatic with high resolution. It is widely used in commercial and domestic surveillance cameras and can be used in pitch dark conditions.



- Thermal imaging technologies record the temperature variation between the background and the foreground. As it doesn't require any illumination, it can be used in pitch dark conditions and during rain, fog etc.



Shwetha S: ***Where are night vision technologies applied?***

Dr. W. Jino Hans: Apart from military applications, night vision technology is used for surveillance, medical diagnosis, autonomous driving assistance and remote sensing.

Shwetha S: ***Can you list the limitations of the aforementioned technologies?***

Dr. W. Jino Hans: Some of the limitations can be:

- The downside of image intensification technology is, it requires a minimum threshold of light and hence can't be used in pitch dark conditions.

- The drawback of active illumination is that the active sensors need to be powered up so that it can be detected by night-vision goggles. This makes it difficult to be used in military applications.

- The disadvantage of thermal imaging is that it's quite expensive compared with other technologies. Temperature resolution is vital in fixing the quality of the image.

It is also important to mention that night vision technologies are not standalone and require integration with other sensory devices such as LIDAR. They need efficient machine learning techniques to be interpreted.

Shwetha S: ***In order to understand the progress in this field, can you explain to what level night vision has been achieved, say when compared to nocturnal animals?***

Dr. W. Jino Hans: This field is very promising and can be employed for various applications. However, it involves a lot of ambiguities during decision making. The rapid progress in this field can be demonstrated by the fact that SPI, a company that produces thermal imaging systems for the US army has developed a device that can capture night vision in full vivid colour. However, these devices are very expensive and at present, can't be used in cost restricted endeavours.

Shwetha S: ***It goes without saying that autonomous vehicles will need to employ night vision. What are the roadblocks that researchers have faced/will face?***

Dr. W. Jino Hans: The main difficulty that researchers will face is the dataset generation. It will be a very expensive process to obtain images. Furthermore, machine learning algorithms require intensive training. To cater to this roadblock, data augmentation can possibly be employed to synthetically generate night vision images.

Shwetha S: ***What are the prerequisites for a student who wants to work on this technology?***

Dr. W. Jino Hans: A student who wants to work on night vision technology must first understand the nuances of image processing and computer vision.

Shwetha S: ***What are the elective options available in the curriculum related to this technology?***

Dr. W. Jino Hans: Students can take subjects such as computer vision or robotics if they want to work on night vision.

Shwetha S: ***What are some prominent companies working on night vision?***

Dr. W. Jino Hans: Some of the companies that are working on this domain are Mad Street Den, FLIR, Soliton Technologies, SPI etc.

Shwetha S: ***What are the current trends in research?***

Dr. W. Jino Hans: Current trends include sensor design, new system capabilities and advanced active thin film research.

US Army soldiers agents as seen through a night vision device during an operation in Afghanistan

Shwetha S: ***Can you tell us about the research you have done in this field?***

Dr. W. Jino Hans: We have developed a driver alerting system that can detect the presence of deer and cattle on-road. We have captured around 5000 images of these animals using a thermal camera and created a dataset to annotate the same. We trained the CNN architecture from scratch to detect the presence of animals on road.

- Shwetha S,
2nd year, C

COUNSEL FOR CONFUSION

Metaphorically speaking, when you complete your higher education, you tend to stand a bit taller and straighter. A question that comes across the mind of many engineers during their degree is what they should do once they complete UG. While some opt for jobs, some still want to study further. After 4 years of engineering, if you are looking forward to pursuing higher education, then you must be aware of all the opportunities in India and other countries. Higher education brings on so many benefits, including a prosperous career and financial security.

There is no right or wrong choice between MS and MBA. It's all about the personal inclination of a student. Those who want to specialise in a particular field would go for an MS. Those who are looking for faster career advancement would prefer MBA. If you have a burning flair to do specialization in a specific domain, but baffled to choose between MS and M. Tech, let me now clear this confusion by drawing a clear line between MS and M. Tech.

- M. Tech is a strictly 2 year course, whereas MS may go beyond 2 years.
- M. Tech has more coursework than project work, in MS coursework is minimal and a large chunk of credits is allotted to the thesis.
- M. Tech admissions usually depend only on GATE scores, MS admissions usually consist of entrance examination scores plus interviews.
- M. Tech students get the degree by finishing the required courses and working in a project up-to standard. MS students have to do research on a topic agreed upon by their advisors which will be scrutinized from a research point of view to award the degree.

Universities in the USA are more developed, more resourceful and more beneficiary. The exposure you will get in a foreign country will be ample but the main problem is money factor. It costs about 54x times more in the USA for the same degree. Going for an MS costs a lot more than going for M Tech especially if you want to go to US or UK. Going to Germany will cost you a lot less, but then going to Germany is a lot more competitive and you will have to learn German also. With tighter norms in the US, Canada has become the best place to do MS for international students.

Canadian degree/diploma is recognized around the world as being of the highest standard and you get all this at a remarkably low cost; both in terms of cost of education and the cost of living. Even though universities and college can come with a hefty price tag, you shouldn't let this discourage you from advancing your education.

Higher education demands an extraordinary undergraduate profile. This includes a decent CGPA, extra-curricular activities, internships, papers/patents, GRE score, SOPs and LORs. The regiments of higher education can instill you with the discipline required in the professional world. By learning to follow complex instructions and meet strict deadlines, you will be better prepared for the rigors of the marketplace. If the corporate is looking for a robotics person and instead he gets a mainframe person, then it creates a skill gap. That said, by furthering your education, you acquire a broad range of skills that can qualify you for a wider range of career choices in different fields and that offer you more room for advancement.

GATE (Graduate Aptitude Test in Engineering) is an exam that tests the comprehensive understanding of undergraduate engineering subjects. With an excellent GATE score, you can enter prestigious engineering colleges (IITs and NITs) for M. Tech. You'd get to expand your knowledge and become a more-qualified engineer.

There are many coaching institutes that train for GATE. You can also choose to enter government-run PSUs and get a good-paying job. The competition level for these jobs is quite high but it's worth it in the end. PSUs check your GATE score for recruitment. There are multiple PSUs, and each of them announces the required GATE score for application every year. Precisely speaking, GATE is a safer option if you score a good rank.

Do you wish to climb up the corporate ladder fast to attain managerial roles?
Are you craving to break from the technical mold?

Well, in order to blend seamlessly into mainstream management roles, it makes good sense for engineers to up skill by studying in an MBA program. Develop a holistic perspective to work and work related problems. Business requires observing the macro level problems. Problem solving is far more complex and dynamic in a business environment. Learn how to solve problems holistically.

The main factor that differentiates US B-schools from rest the of the world is the fact that American MBA is all about expanding your network and knowing the right people. Ultimately it will be this network of people which will help budding entrepreneurs.
It is mandatory for the applicants to clear GMAT and English proficiency tests like TOEFL or IELTS. If you wish to study in India, MBA Admission through CAT is the best option. IIM admission and selection process begins after the announcement of results. Each IIM fixes minimum CAT cut off percentile for shortlisting of candidates. Those who meet the cut off are eligible for admission.

Higher education gives you the opportunity to rise above your parent's socioeconomic status and become something better. Today, the existing market is made up of more architects, artists, designers, healthcare workers, information technology experts, video game developers, and so forth. You have the chance to adapt to this new era and succeed in it with a higher education that incorporates these fields into its curriculum.

- Gayathri Narayana Y
3rd Year, A

WASSUP?

Be a magnet that draws opportunity. Paint brilliant thoughts and actions. Mirror success. It's through curiosity and looking at opportunities in new ways that we've always mapped our path. Utilize this section filled with events and conferences to show the real you.

Event: Machine learning for engineering application

Venue : IIT Delhi Campus, New Delhi
Date : 1st–5th June 2020
Event type : Short course

Event: International Symposium on VLSI Design and Test (VDAT-2020) during 2-4, July, 2020

Venue : IIT Bhubaneswar
Date : 2nd-4th July 2020
Event type : International Conference

Event: Short term course on Enhancing Communication ,Empowering Technocrats

Venue : IIT Bhubaneswar
Date : 1st-5th June 2020
Event type : Short course

Event: Introduction to AI and IoT

Venue : IIT Kanpur
Date : 2nd-16th June 2020
Event type : Summer Training-Internship Program

Event: Workshop on Smart Grid Technologies-Operation, Control and Recent Deployments

Venue : NIT Tiruchirappalli Tamil Nadu
Date : 12th-13thJune 2020
Event type : Workshop

Event: short term course on Materials to Maintenance in Pavement Engineering (MMPE)

Venue : IIT Bhubaneswar
Date : 22nd-26th June 2020
Event type : Short course

Event: Applied Machine Learning and Data Science

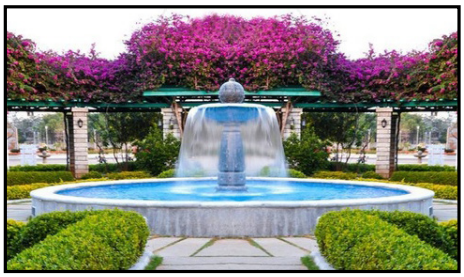
Venue : IIT Kanpur
Date :19th June-3rd July 2020
Event type : Summer Training-Internship Program

Event: Short Course on Modelling and Simulation of Nano-Transistors

Venue : IIT Kanpur
Date : 6th-10th July 2020
Event type : Short course

Event: ICICSE 2020, 8th International Conference on Innovations in Computer Science and Engineering

Venue : Guru Nanak University ,Ibrahimpatnam, Telangana
Date : 10th-11thJuly 2020
Event type : International Conference



Event: IEEE workshop on electromagnetics

Venue : SSN college of engineering ,Tamil Nadu
Date : 23rd-24th July 2020
Event type : Workshop

Event: SocProS 2020 ,International Conferences on Soft Computing for problem solving

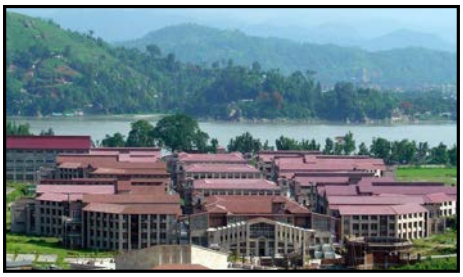
Venue : IIT Indore
Date : 29th-31th July 2020
Event type : International conference

Event: 2nd International Conference on Microelectronic Devices Circuits and Systems

Venue : VIT University ,Vellore ,Tamil Nadu
Date : 12 Aug 2020
Event type : International Conference

Event: Icres2020, International Conference On Renewable Energy Systems

Venue : SSN college of engineering ,Tamil Nadu
Date : 26th – 28th August 2020
Event type : International Conference



Event: TECHEXPO 2020

Venue : IIT ,Guwahati, Assam
Date : 3rd- 6th September 2020
Event type : Science Exhibition and Competition

Event: 6th IEEE International Symposium on Smart Electronic Systems

Venue : VIT University ,Chennai ,Tamil Nadu
Date : 14th-16th December 2020
Event type : International conference

Event: RoSMa2020, 2nd international conference on robotics and smart manufacturing

Venue : IIITDM Kancheepuram
Date : 16th-19th December 2020
Event type : International Conference

Event: International Conference on Foundations of Software Technology and Theoretical Computer Science

Venue : BITS Pilani
Date : 15th- 19th December 2020
Event type : International Conference

- Pooja S
2nd year, B

GADGET GIZMOS

Ever mistaken your laptop screen for your tablet and been annoyed that it didn't respond to your touch?
Been there. Done that.
But now there's a solution for this. Any laptop's screen can be transformed into a touch screen with the Airbar!

AIRBAR

Any laptop's screen can be a touchscreen!

The Airbar is a sleek, weightless and user-friendly USB pluggable device that adds touch and gesture functionalities to a laptop's display. The touchscreen sensor was launched by the Swedish company Neonode in July 2017 and was welcomed enthusiastically by Windows and Mac notebook users.

- **Compatibility and Installation:**

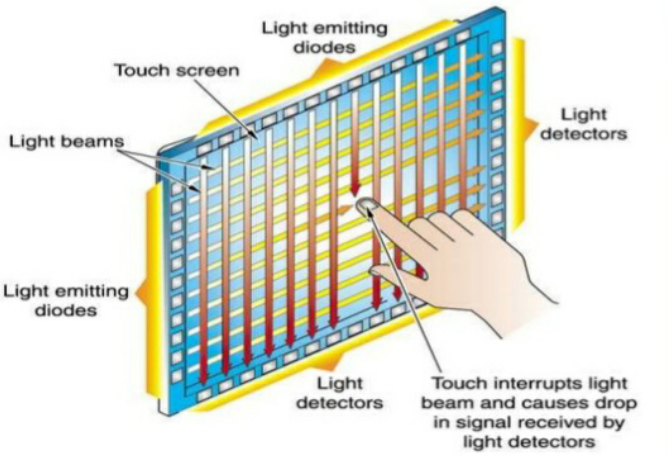
It works well with all laptops running Windows 7, 8, 10 and MacBook Airs (not compatible with MacBook Pros). It comes in three sizes – 13.3", 14" and 15.6". The Airbar sensor magnetically attaches to the bezel of a laptop at bottom of the display and is plugged into the USB port. It doesn't require any configuration or software installation. However, to obtain multi-touch support like zoom, pinch and swipe an additional software, which comes with the device itself, is required.

AIRBAR

- ## What is the technology behind it?

Neonode uses the **zForce Air™ technology** to implement this marvel. It is based on the working of **IR (infrared) sensors**. Once the device is plugged in, it blankets the display with an invisible light field.

Emitters pulse infrared light just above the touch surface. It pulses light at a rate of 120 times a second so that the grid is continuously refreshed. Any interruption in this field is detected and converted to coordinates by several mathematical algorithms. This provides the exact position of touch to the laptop. The calibration is done by advanced algorithms that adjust power provided to the emitters.



- ## Perks of using an Airbar:

As it doesn't work based on resistive or capacitive touch, it can even detect the strokes of a brush, a pen or gloved hands! It has a touch resolution of 250 DPI (dots per inch) with a response time of 1ms. Moreover, it doesn't require any calibration after installation. It comes with the tagline "Plug and touch", user-friendly and easy to use. Contrasted to conventional touchscreen laptops it is cheaper and weighs much less. It reduces the glare that is typically unavoidable in touchscreen laptops.

Uses:

» To take notes, highlighting and scrolling through pdfs directly on the laptop itself without a digital drawing pad.

» To handwrite one's own signature while filling online forms.

» For digital art or to perform edits while explaining a presentation.

» If the laptop's display is switched to portrait it can be used as a tablet itself.

» Browsing through the web is much easier with pinch-to-zoom and swipe features.

»

- ## Cons and Limitations:

There have been some complaints about lag in the response to touch. It certainly doesn't have the precision of a touchscreen laptop. Devices that don't have a USB port but only type-C input or some other form of input will not be compatible with the Airbar. Another disadvantage is that it can detect only two touch inputs at a time.

The Airbar has only a few limitations but many uses. It is a novel technology with a smart and logical implementation. It may not be an essential for the laptop but is definitely a fun and fancy utility addition.

- Aishwarya Ponni P,

2nd year, A

FIXD

A Vehicle Health Monitor

Do you often get confused and start panicking when the check engine light alert suddenly turns on in your car? Are you afraid you will forget to take your car for its regular oil change or other maintenance?

If so, It would be good if there existed a tool that will alert you when it is time for maintenance and other concerns. Well good news for you, such a tool does exist! Throughout the past decade, we've witnessed the release of some of the most advanced inventions in technology. One of such inventions being a system alert diagnostic tool known as "Fixd" that is designed to give real-time health status of your car. Any car can be a smart vehicle. That's the appeal of this simple device that can identify information ranging from when you need to bring your car in for maintenance to why that check-engine light just came on.

- **What is Fixd?**

Fixd is a hardware-software combo sold by Georgia-based Fixd Automotive that gives you actionable information about your vehicle. The Fixd sensor is 1.96 x 1.65 x 0.78 inches in size and weighs just 0.96 ounces. It is designed to easily and securely plug into the car's On-Board-Diagnostics (OBD) port from where it will gain access to the self-diagnostic computerized system of the car.

- **How does Fixd work?**

Fixd features a sensor that plugs into an OBD-II port in your car. Once you plug in the sensor, you just leave it there, since it's powered by your car. In other words, you don't have to worry about recharging your Fixd sensor.

You'll want to download the Fixd app, either from the Apple App Store (for iOS) or Google Play (for Android), depending on which platform you use. Once you launch the app, create an account to connect your Fixd sensor to the app via Bluetooth. After a successful connection between the two, you'll be able to get information about your vehicle. The hardware feeds information from your car to an app on your smartphone. And if Fixd pinpoints any problems, you can give that data to your mechanic. It is also a handy maintenance tool that can remind you when your car needs service.You can peruse the app anytime to learn more about what's happening in your car. Fixd will also send you notifications to let you know when something is wrong.

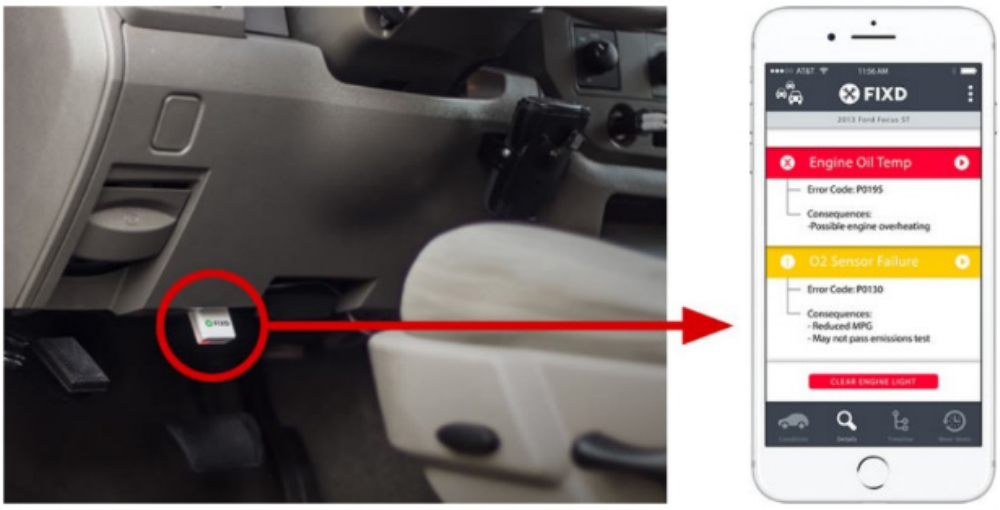
- ## Which cars work with Fixd?

To use Fixd, all your car needs is an OBD-II port. All cars manufactured in 1996 and after have an OBD-II port which is usually located under the dashboard on the driver's side. The Fixd sensor works on all gasoline-powered cars equipped with an OBD-II port, but it doesn't work on cars manufactured before 1996, nor does it work on cars that are powered by diesel engines or cars that are exclusively electric. However it will work on hybrid cars. The company is currently beta testing diesel-based vehicles, and says that it had got success with models made after 2008.

- ## What kind of car problems can Fixd identify?

When a check engine light turns on it's because the system has detected an issue such as a misfiring cylinder, a malfunctioning mass airflow or oxygen sensor, or a fuel vapor leak. The on-board computer generates a code that mechanics use to troubleshoot and resolve the problem, which is why you'll see them at work staring at a handheld screen with the engine running.

The Fixd sensor lets you see what the mechanic sees, and is capable of detecting up to 6,800 possible causes for a check engine light. Although Fixd doesn't list all of the things that its app can find, it does say that it can identify major issues, like whether your engine oil temperature is too high or your O2 sensor has failed. It can also tell you if your car has bigger issues that you should bring to the mechanic.



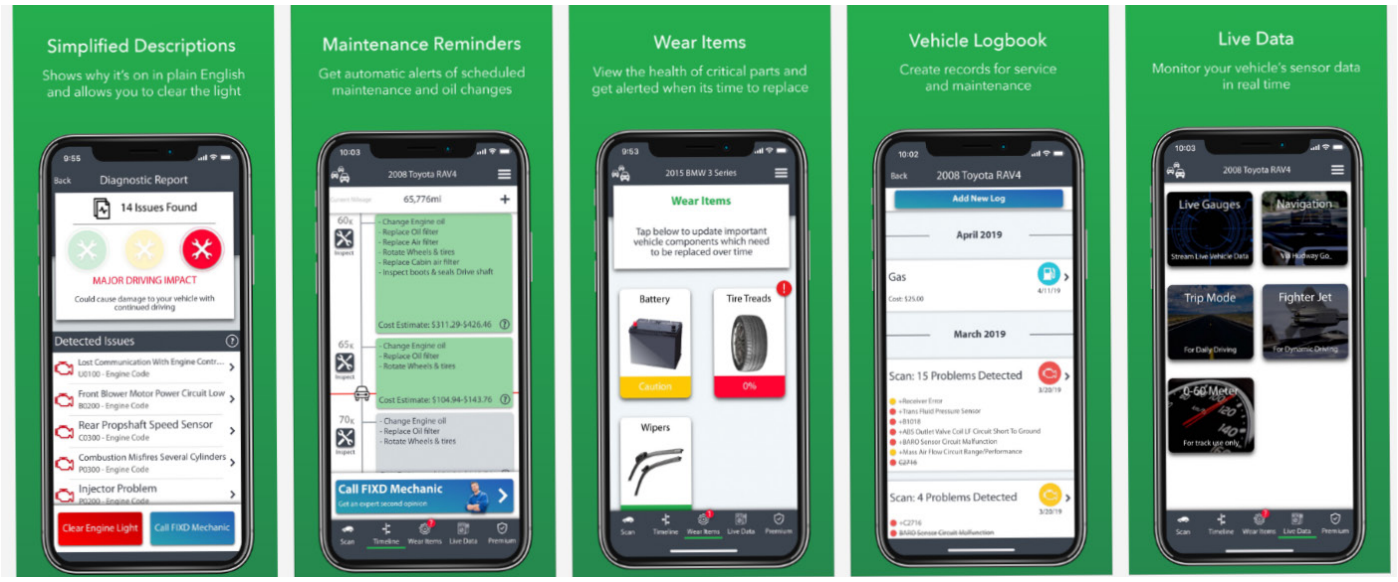
You can also use the Fixd app to clear the check engine light, in case the problem turns out to be insignificant. You can also clear the other dashboard lights via the app as well. It also offers a description of the probable cause, along with the standard error code and possible consequences if the issue is not resolved. It'll let you turn off the light, but it won't diagnose other dash light indicators such as ABS (anti-lock brakes), TPMS (tire pressure monitoring), airbag, stability control, or transmission cooling.

Additionally, it can keep track of your car's maintenance schedule. Once you plug the sensor into your car, it will determine what your car's manufacturer recommends for maintenance at each milestone and alert you to those recommendations. It monitors your mileage so you know what you need to get done.

- ## What about the Fixd app?

Fixd's companion app is where you'll learn all about your car. It uses a free Android or iOS mobile app and communicates with your phone via Bluetooth. The app connects to the Fixd servers via cellular or Wi-Fi to retrieve diagnostic data and save your car's scanned results. It opens to a Condition screen that has a big" Tap To Scan" button in the centre and a small engine icon button just above it. Along the bottom of the screen are Timeline, Wear Items, and Logbook buttons, as well as a button that takes you back to the condition screen.

Use the 'Tap To Scan' button to begin a scan: If no problems are detected you'll see a green Fixd icon, if moderate issues such as a faulty EVAP sensor are found the icon will turn yellow, and if it identifies more severe problems such as a misfire or a malfunctioning EGR Vacuum regulator the icon will turn red. If an issue is detected, tap the Details icon to see the diagnosis with a brief description and possible consequences if the issue is not resolved.



Tapping the engine icon opens the Other Dash Lights screen with buttons for Brake System, Brake Pads, Engine Coolant, Oil Pressure, Tire Pressure, Stability Control, Maintenance Light, and others. As mentioned, the Fixd does not currently scan for issues with these components, but if you tap any icon you'll get a description of what the light means. The Timeline screen offers maintenance reminders including routine oil changes (every five months), tire rotation, air filter replacement, steering linkage inspection and lubrication, transmission fluid changes, and more. Tapping the Wear Items button takes you to a screen where you can enter information about the battery, tires, and windshield wipers, such as the last time they were replaced, the amount of tread, and the battery voltage (there's even a built-in voltage tester).

Fixd will use this data to notify you when it's time to replace the battery, wipers, and tires, and has a Purchase button that gives you a list of compatible parts you can purchase through Amazon. The Logbook keeps records of recent scan results and cleared codes.

Tapping the three-bar icon in the upper right corner launches a menu where you can view and edit your account information, add new sensors to your account, see a map of local repair shops, buy parts, and view active recalls for your vehicle. Tapping the car icon in the upper left corner displays all active sensors and vehicles associated with your account. The app can work with multiple cars, so if you want to put a sensor in each of your family's vehicles, you can do so, and you'll receive the data from all of your cars on one phone. From the app, you can choose the car you want to diagnose, and you'll be good to go.

- ## How is Fixd different from other devices?

Fixd isn't the only device on the market that can track your car's health. The sensor seems to have benefited from its retail availability at the world's largest retailers, something not all of its competitors can match. Additionally, Fixd's app is considered one of the best designed and programmed app in the space.

The company claims that this sensor stands out by breaking down problems into simple and understandable terms. Instead of giving you a code or technical description, the device alerts you to the severity of the issue, the consequences of continuing to drive and the maintenance timeline for your specific make, model and year. The company has tested a number of OBD-II scanners under $100, and the Blue Driver Bluetooth Professional OBDII Scan Tool came out on top. It goes beyond basic scanners to show recalls and dynamic data, as well as offer repair suggestions.

- ## How much does Fixd cost?

You won't be able to find Fixd everywhere. The company sells the sensors on its website and at Amazon, Walmart and Best Buy stores. One Fixd sensor costs about $59.

So the Fixd sensor won't actually fix your car for you, but it does a great job of diagnosing issues quickly and accurately. It's affordable, reliable, and easy to use. The cons are few such as Slow sensor connectivity sometimes and the Reports concern engine light issues only.

- Divya N,

3rd year, A

INTRIGUE

SANJANA GANESH

Excelling in a particular sport requires complete dedication and focus on the field along with a tough grind practice. Sanjana Ganesh is one such industrious sports-person from 4th year ECE, who is an impassioned basketball player. She has been playing several competitive matches for almost 10 years. Speaking on how she got into the sport, *"I wasn't really aware of this sport at first. I never watched basketball matches and I was more exposed to cricket because of my family. It just happened by the end of my 6th standard. Our coach was planning to form a junior basketball team. Based on my performance in PT classes, I was selected. Having the advantage of being a left hander and also being quite tall, I just took a shot for time being, went for practice, participated in several matches and eventually acquired interest towards the sport."*

The practice used to be physically exhaustive, and thus it was extremely challenging for her to balance academics and sports at start. *"In course of time I gradually gained confidence and figured out a way to harmonize both as I had no choice. Moreover, school was comparatively easier to manage as the practice sessions happened either in the early morning or after classes. So, there isn't a need to compromise on classes and it's enough if one pays attention in class. On the other hand, college was more difficult to handle as additional effort becomes paramount apart from the routine and a lot of classes needs to be sacrificed for tournaments. However, it depends on the person's interest and perseverance to accomplish both."*

She did her schooling in Dubai where the exposure to sports was meagre compared to India, where there are multiple levels. Thus, in school at most what she had was school tournaments and CBSE Clusters. In fact, she got much more opportunities once she joined college. She researched about a lot of colleges and chose SSN, which gives importance to sports, so that she could play basketball full time. She has represented our college in various tournaments such as the Anna University zonals in which she participated every year. One of her achievements includes winning the zonals and being positioned third in the inter zonals last year. She has participated in a multitude of outstation tournaments in Andhra Pradesh, different parts of TN - Tanjore, Trichy and also tournaments conducted by Shiv Nadar university.

"Whenever I am inside the court playing basketball, win or lose doesn't matter, it gives me happiness and a sense of satisfaction"

Sanjana was a part of the core committee, organising the SSN TROPHY this year. *"I love to be on the organising part. Back in school, I was the captain of the basketball team and thus, associated with various organising activities. Even in college, every year I involve myself in one activity or the other. And this year I got the chance to relive those moments from school, leading the team and involved in organising events. Being the head of the Promotion team, the work turned out to be quite stressful contacting people from various colleges, pleading them to take part in*

the competition. Above all, I learnt a lot about how to handle pressure, coordinate with people, delegate work effectively and much more. Over all, it was an amazing experience."

Reminiscing her most memorable moment on field, it happened during a school tournament final. **"***The match was deadlocked; the clock was ticking only a few seconds left and the opponent was leading us by two points. I still remember how the opponent coach was shouting not to let us put a three point! That kind of provoked me to somehow win the match. Luckily, I got the ball and attempted a three point. And the ball actually went in but at that very instant the whistle was blown. We were so tensed and stared at the referee if that basket was counted. The moment he gave signal that it was indeed considered, we all went jumping and screaming. I always feel proud of myself for putting that basket."*

Though at the outset she just wanted to try out, it eventually grew into something which is a part of her and since then she has never stopped playing. **"***Whenever I am inside the court playing basketball, win or lose doesn't matter, it gives me happiness and a sense of satisfaction. At times, I used to feel like a world class player when I hear people shouting my name from gallery. When SSN trophy got over this year, which was like my last tournament, realising that I won't be playing the competitive part again, I know how much tears I shed. My love for the game never ends and I will do anything to play competitive once more."*

-Divya Seshadri M

3rd year, A

SABHARISH PADMANAABAN M

Carnatic music is an integral part of our culture. It is an elegant style of music that takes years of practice blended with one's creativity, and perfection's the sky limit. Often, many who are proficient with instruments or Carnatic vocal have to start at a very young age. However, today's world is brimmed with western music dominating several cultural fests. Thus, to encourage budding Carnatic musicians, our college has been providing scholarships for students with skill and interest towards Carnatic music. To know more about the scholarship, we sat down with Sabharish Padmanaaban M, the head of the music club (SMC), who is a virtuoso violinist and has secured the scholarship twice.

He strongly feels that a student with a pure Carnatic background might not feel comfortable with the prevalent western bands in our college at start. He says, though he has been learning and playing violin in Carnatic style from a young age, it took a lot of time and effort to work with bands in our college. This scholarship serves as a major source of recognition and motivation for those who are into the Carnatic field and not much interested in the western or fusion.

The scholarship is open to students of all years and a student can try to avail the scholarship every year. However, the scholarship is not pertinent to all instrumentalists. A person well-versed in Mridangam, though being a Carnatic instrument, wouldn't be able to apply for the scholarship. The details regarding the list of instruments that are approved are circulated to the students by email. The number of students who are benefitted from the scholarship vary every year, and the total amount is distributed among them according to their rank. Earlier, the scholarship sum was distributed between the

best vocalist and the best instrumentalist, but very recently up to 5 students got the scholarship, with the minimum amount being around Rs. 30,000.

Students in pursuit of this scholarship, should register for the same and quote their achievements and journey in the form. An interview would be held with professional and experienced panel of judges during which the students can manifest their skills and creativity. Based on their performance, students are awarded marks and ranked. Those who secure a high score are qualified and avails the scholarship.

The purpose and implementation of this scholarship is a testament to the vision of our college to instigate and drive its students to be all-rounders of the highest calibre.

-Navin Koushik M

2nd Year, B

PERSPECTIVE

Learning how to Learn

The most organic, yet subtly conspicuous process that has taken place, and will continue to take place is knowledge explosion. There is little doubt over the fact that scientific knowledge and understanding of the world has, over the last 4 centuries, grown exponentially, reaching its zenith in the 20th century, which is worth mentioning because of the pathbreaking discoveries made in physics. This process has occurred at the behest of various experiments and thought trails of remarkable scientists who have labored to seek answers about the world we live in. Today, almost every field has a dignity that cannot be denied, with billions of dollars being invested into R&D with the sole purpose of discovering and understanding to quench our thirsts. One just needs to take at the look at the healthcare sector, where there is a new medical procedure or device being founded every day somewhere in the world. Archaeological evidences are now able to take us back to our early civilizations. Zoology is being harnessed to study and appropriate various species of the living world, with remarkable discoveries of its own. Engineering itself has grown at a tremendous rate, with the invention of the transistor being the catalyst that has and still continues to drive everything about our lives today. So, in essence, knowledge explosion has impacted every possible area of our lives.

Why am I saying all this? Because, it is for the very same reason that our lives are changing constantly. By this, I do not point to our changing lifestyles or the new gadgets coming into our habits. Rather, it is the very concept of change that I am trying to address here. The fiercest impact of knowledge explosion has definitely been on education, and this is what, I believe, should be taken very seriously. Types of education, methods of instruction, discipline, levels of education-all these have seen a lot of change over the years. Graduating as an engineer in India in the mid-twentieth century was seen as an achievement that only a handful could hope to achieve in a lifetime and it was something that guaranteed a luxurious lifestyle back then. Today, we have lakhs of engineers graduating in India every year, with a majority of them going abroad for higher studies. Even in India, diverse fields have opened up for people to pursue higher education.

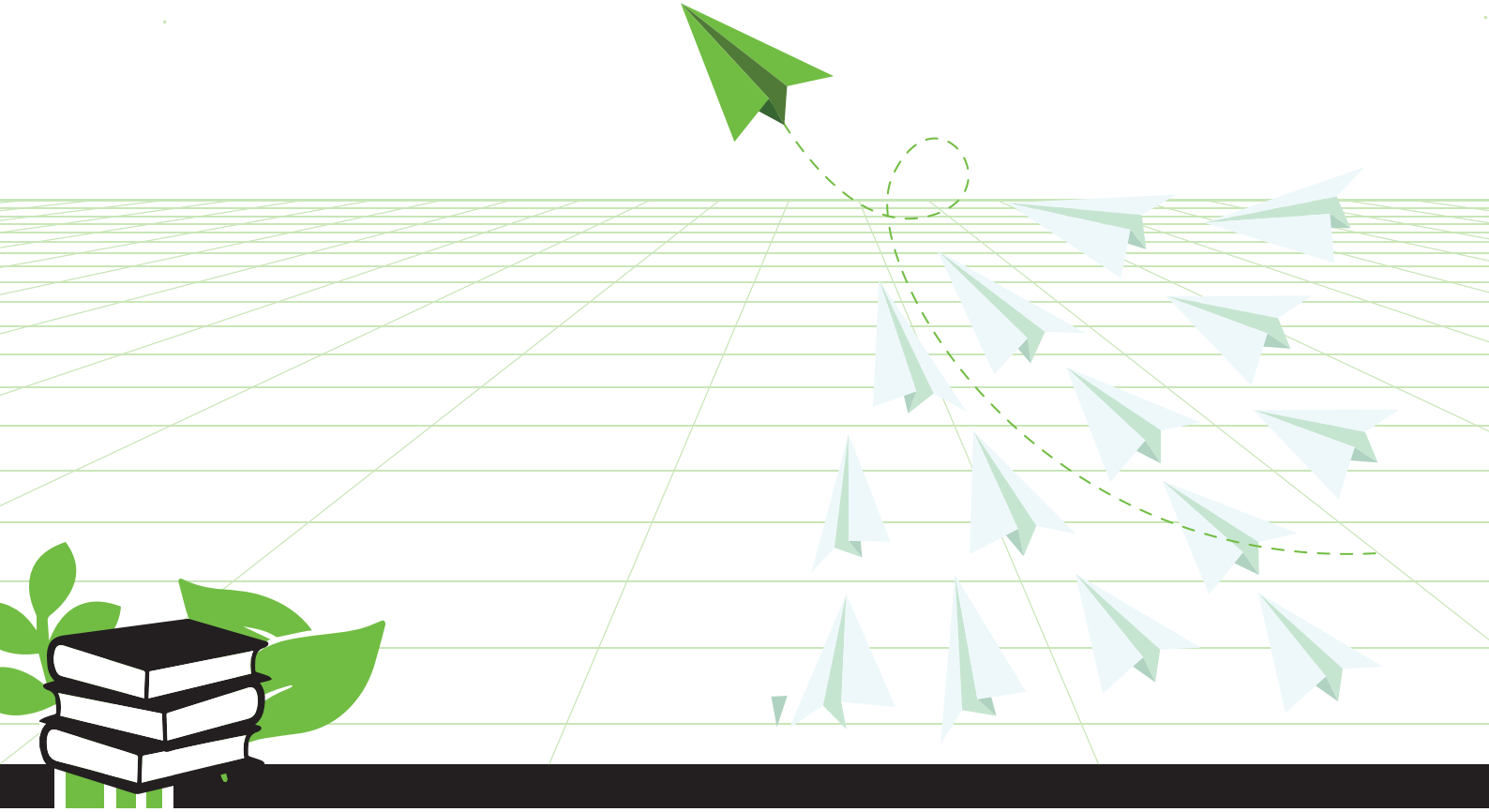
It is also important to note that, the methods of instruction have also undergone a significant change. About five decades back, engineers had to work with equipment and devices with their own hands and go about their work based on rough estimates. But today, everything is implementable on a computer, with each type of problem even having a different software that can be used to solve it.

Again, why am I saying all this? Because, there is now so much information in the atmosphere that it is practically impossible to learn everything, even if in a particular field. Learning equations or remembering diagrams, though extremely important, are not practical progressive steps in the fast-paced world today. It is impossible to make a career today out of doing these things. This is simply because the emphasis is changing from learning to learning how to learn. And we are caught right in the middle of it.

The new technologies that send everyone into a frenzy today are merely byproducts of this transition. In essence, they help users process data without bringing the complex analysis onto their screens. This way, everybody would be able to make significant progress in their interests with the help of these technologies, even if they do not know the working of the math behind it. Naturally, those who do not embrace this will be left behind.

It is for the same reason that those who lead this transition will be the leaders of the world in the near future. This is not to say that basic knowledge and know-how of things should be ignored, rather that learning how to learn something about everything will yield better results over the long term. It is a way of hanging on in today's world.

- Rangasubramanian K,
2nd year, B



WRITER'S ENCLAVE

Takeaways from the pandemic

It is no real secret that the year so far has witnessed an unfortunate global situation, and has put millions of people and even entire countries at a severe disadvantage. In its wake, the novel coronavirus has killed hundreds of thousands and infected atleast ten times more people. This has caused us to retreat into the safety of our homes to avoid contracting the virus. Though this lockdown is completely essential given the circumstances, there is no denying the fact it has disrupted the lives of many. Educational institutions have shut down, factories have been closed, office rooms locked and many stores have been shut. Though this may seem unfortunate, I believe that this lockdown has made us all enter a new learning curve, which I believe has the potential to open up new avenues that all of us can leverage to our advantage.

The foremost impact of this lockdown is probably the fact that people have been forced to work from home. Conference calls, client meetings and presentations are being conducted with the participants sitting in the comfort of their homes. Thus, corporate executives are working to meet deadlines but from the vantage point of being in their own comfortable environment and more often than not, this would result in higher levels of productivity, as has been confirmed so far in reports.

A similar trend is being observed in academia. Online classes have enabled both instructors as well as students to be a leisure with their environments, which has the added advantage of helping both parties focus better and result in higher levels of engagement with the topic at hand. It is therefore no secret that educational institutions are witnessing faster completion of syllabus and better participation from students.

The biggest positive impact of the lockdown, in particular, and the pandemic, in general, has to be the increased awareness of hygiene and cleanliness among people today. Emphasis has been placed on the importance of unnecessary and non-essential interaction. Global use of hand sanitizers and soap has increased at a sharp rate. Keeping in the rearview mirror, the fact that a good vaccine will take at best a year and a half to develop, this trend will continue even after the lockdown is uplifted.

This lockdown has also taught us that we can live without half the things that we are used to living with. The time at home has definitely forced everyone to learn new ways of engaging their bodies and minds. Those who used to go to the gym are working out at home and trying their luck with such things as yoga. Visits to malls and bars have been replaced with boardgames and unsuccessful attempts at playing the guitar or the tabla that was ditched years ago. The time used for travelling is being utilized to clean out musty shelves and catch up with long lost memories. More importantly, it has given everyone a lot of time to spend with their loved ones and also to contemplate on their path in life.

While the lockdown has put the entire world at a disadvantage, its negatives cannot cloud out the advantages that it has presented to a world. Just like a painter who is forced to come up with a good piece of art because of the size of the canvas, the restrictions have turned out to be the stimuli for our creative cells. Since we have been exposed now to the possibility of achieving everything we used to and more, it is hard to predict a future where life would continue as it did prior to the lockdown. The future, in my opinion, will see a very high use of technologies and online platforms and will also witness greater productivity in turn, with the actors involved also experiencing better work-life balance. Maybe the future that we were looking forward to.

- Rangasubramanian K,
2nd year, B

The Glorious Night

A love for the nocturnal beauty,
You can never get enough of,
A rush of emotions,
You can never run from.

Doesn't the night make us more vulnerable?
An unusual amount of everything.
What-ifs and maybes,
Midnight snacks and melancholic poetry.

I look outside,
Looking for myself, inside.
The moon and the stars,
My flaws and my feuds.

Retrospective reflections fuelled by the raspy wind,
Whispering secrets in an alien language.
"You shouldn't have said that."
"You should have said that."

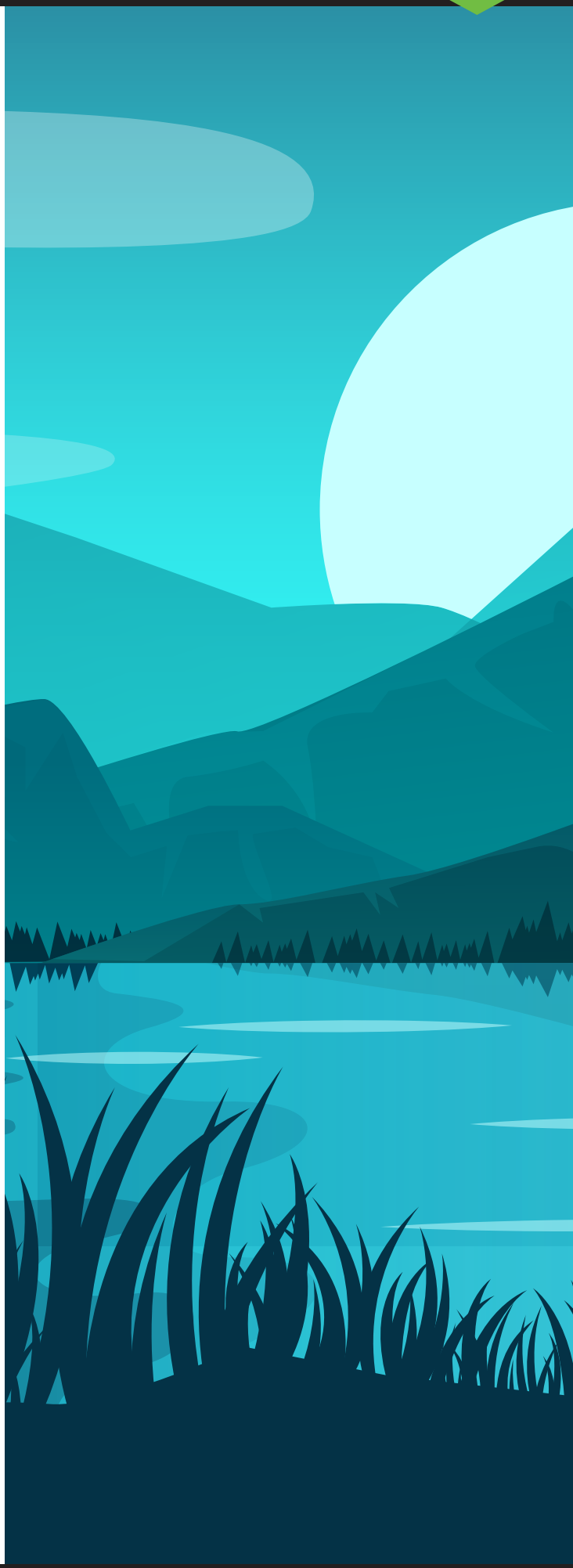
Revelling in these hours of darkness,
Enwrapped in my questions and musings,
I give myself up to the chill of the night
In a delightful shiver and smile.

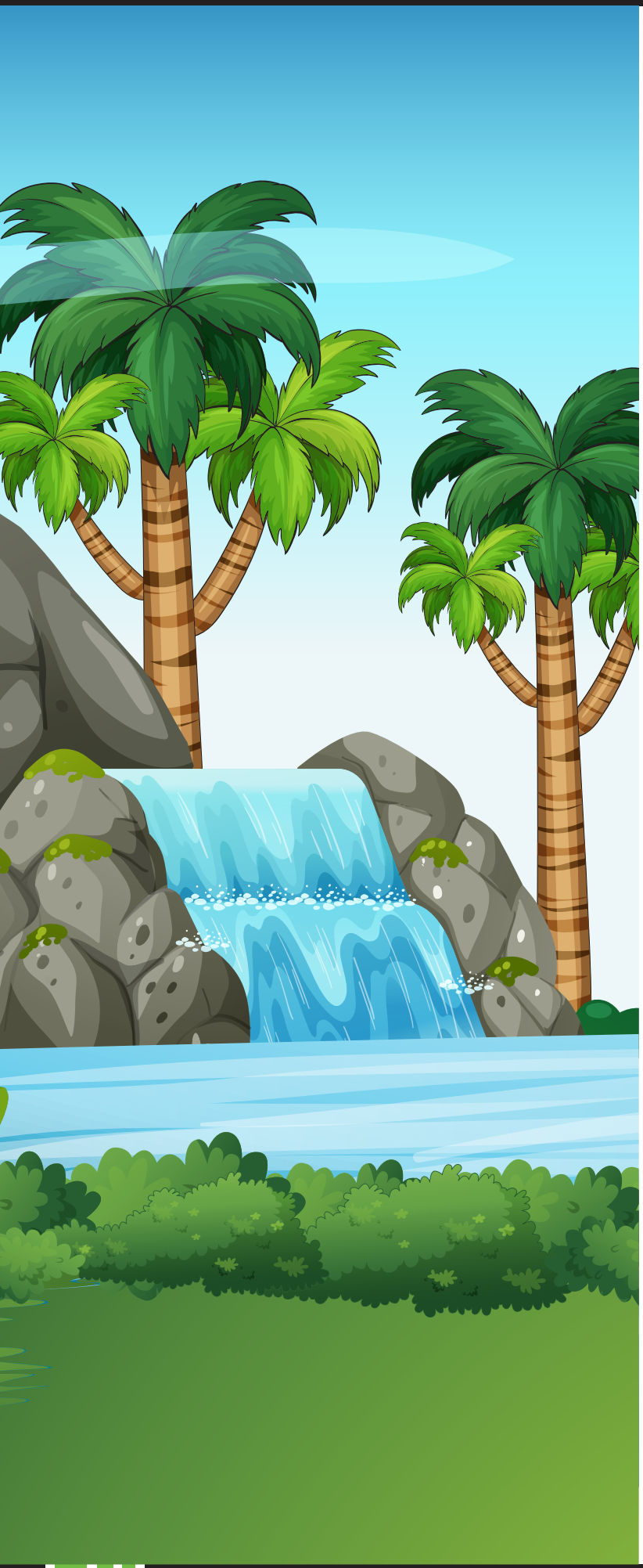
Asking for more of the night
Than she had to offer.
Wishing for more of this life
Than fate had to offer.

As deep as these thoughts go,
The night isn't as poignant always.
Flashes of myriad memories of a carefree night,
Good food, merry music and loud laughter.

Time slips by precariously
As I am lulled to sleep
By the rhythm of my heart
And the hum of the night.

- Aishwarya Ponni P,
2nd year, A





The Waterfall

Sights.
I could only imagine
The beauty that lay ahead
The picture painted by the same hand
That denied me the right to admire it.
Could only imagine the colours that
Everyone took in so blasely
So unattainable for a man like me
For whom colours were like distant memories
Lost in the winds of time.

Blue.
I could smell the salt in the air
Grains of sand clinging to my feet
The lapping of waves in the background
Ah blue, I could feel my love in my arms;
Her hair between my fingers
Her tears staining my shirt.

Green.
Oh the way my stomach would turn
When people called my eyes beautiful
As lifeless as they were
So like figurines in a park.
But green was also nature
Petrichor tickling my nose
As drops of water trickled past
My unseeing beautiful eyes
But I focused on her hand in mine
And the warmth I felt
As we walked on and on.

Waterfall.
I could feel the tremors underneath my feet
As the water raged forward
I could hear the gasps of awe
At the splendor in front of me
I admired the waterfall too
The smells and the memories
The ghosts of old feelings
They were right
it truly was beautiful

- Pabbichetty Nimisha,
2nd year, B