The Department of
Electronics and Communication Engineering

PRESENTS

Impulse

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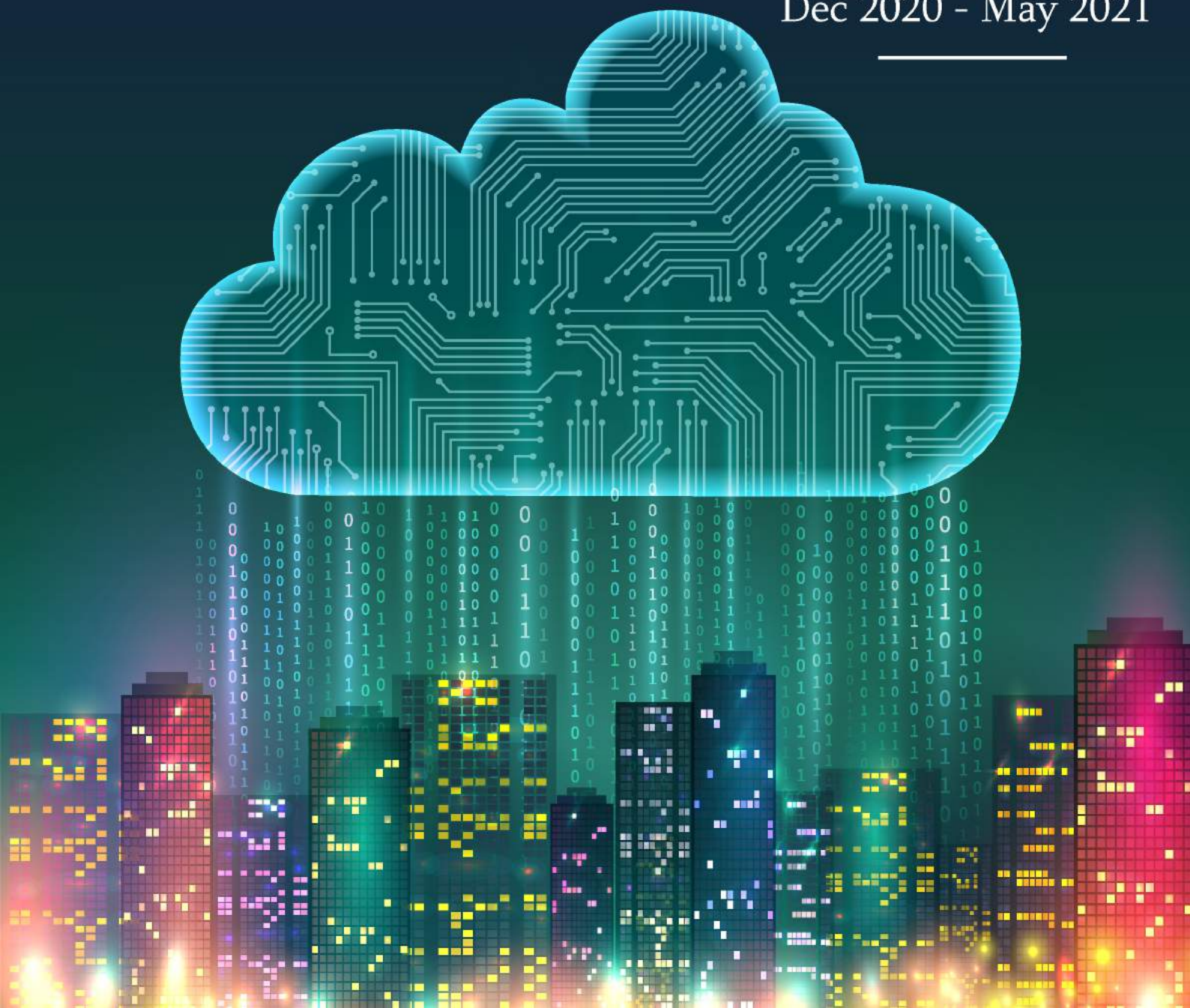
Half-yearly Newsletter
Dec 2020 - May 2021



EDITOR'S NOTE

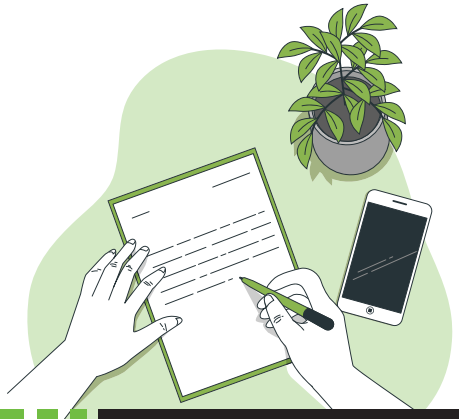
Hello Readers!

It is with immense pleasure that we, on behalf of the ECE department, present to you the next edition of the Impulse magazine!

The Impulse Magazine is a repository of intriguing articles by students, faculty and alumni alike on their achievements and experiences in co-curricular and extra-curricular activities collected in one place for the readers to revel in. This edition documents the events that transpired during the time period December, 2020 - May, 2021. We hope you enjoy the contents of this edition as much as we enjoyed putting it together!

This edition, compiled in the midst of an unforgiving pandemic would not have been possible without the support of our faculty in-charge, who guided and mentored us during the entire duration, and the Impulse Content & Design team, who worked against impossible deadlines to make this magazine a reality. This edition, unlike any other, has been crafted with love by the editorial team of 2020 and 2021. We're extremely grateful to our seniors for their guidance, valuable insights and contributions. We would like to extend our heartfelt gratitude to each and every one of them for all the hard work they put in, making this edition a grand success.

This last year has been extremely challenging for all of us. However this pandemic has time and again demonstrated the human tendency to fight back and emerge stronger. Here's to hoping that the situation eases soon, so we can meet in person at our beautiful vibrant campus very soon!



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CONTENTS

INVITED ARTICLE

Dr. P. Kaythry
B.E., M.Tech., Ph.D
Associate Professor

Printable and Flexible Sensors

Printable and flexible sensors are of great interest in recent years in many of electronic sensing devices. These electronic systems have become more complicated in recent decades in terms of their design and operation. Furthermore, with the development of Internet of things lot of attention is paid to the interaction of humans and high-tech equipment and personal devices. Nanotechnology serves as great boon for creation of different kind of sensors with new sensing materials using printing technology. These printable sensors can be made with low-cost engineering, thin, lightweight, transparent, flexible, stretchable and biocompatible ones for monitoring various factors and process the information. Some of the printable sensors are discussed in this article.

Temperature Sensor

Temperature sensors can be of two types: *contact and contactless.* The contact sensors are classified as follows: *thermo-resistive, thermoelectric, pyroelectric, or thermomechanical* whereas contactless sensors are IR detectors, under the influence of electromagnetic waves of certain length, changing conductivity of the sensitive material or voltage between two electrodes. Among the printed electronics, resistors whose electrical resistance greatly depends on the temperature are of great interest.

Conductive materials such as gold (Au), silver (Ag), copper (Cu), platinum (Pt), nickel (Ni) and aluminum (Al) are used as electrodes and wires of sensors. Compared with the rigid metal temperature sensors, the flexible metal temperature sensor has high mechanical flexibility. Because of its flexible nature, it can easily attach to highly curved surfaces. Also flexible temperature sensors are more suitable for detecting small temperature changes and distributions in a small range happening. Compared to expensive platinum, Au has better conductivity and flexibility. The stretchable sensor shown in the figure 1 is made of Au electrodes. To withstand the tensile strain, sputter deposition is used on a pre-stretched polydimethylsiloxane (PDMS) flexible substrate Chromium (Cr)/Au thin film. And a reversible bendable and stretchable flexible temperature sensor is fabricated through a photolithography process. The performance of the device is not changed, while stretching the device to a maximum of 30%. After lamination forming the required pattern, it is used to monitor the temperature change of 20–120 °C, This property is a result of micro folds on the sensor surface, which can be obtained if the substrate is subjected to slight stretching during the transfer of the active layer.

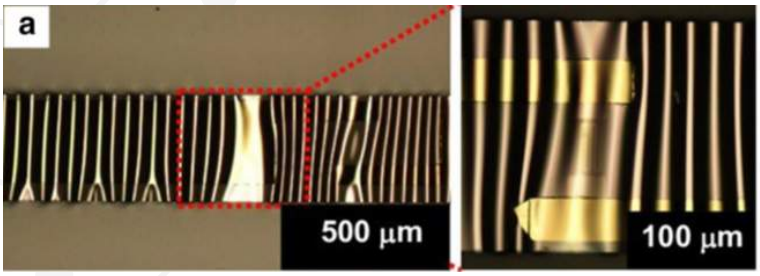


Figure 1. Temperature Sensor able to stretch up to 30% of its length [2]

Polymers are the most used materials in flexible and printable sensors. These polymers are used as substrates, thermally sensitive composite materials with mechanical flexibility, lightweight, transparency, easy processing, stable performance and low fabricating costs. The application in temperature sensor has attracted much attention. Thermo sensitive polymers often used in temperature sensors. An intrinsically stretchable temperature sensor element based on organic thin-film transistors (OTFTs) is shown in figure 2. The OTFTs were characterized with respect to their temperature and strain dependence, and subsequently evaluated using differential readout circuit schemes. Two circuit variants are considered temperature sensor shown to accommodate OTFTs with nominally positive or negative threshold voltages. Poly(diketopyrrolopyrrole-[3,2-b] thieno[2',3′:4,5]thieno[2,3-d]thiophene]) (PDPPFT4) and Poly (isoindigobithiophene) (PII2T) these two organic semiconductors (OSCs) are blended and spin-coated on the gate dielectric, Carbon nano tube (CNTs) are used as electrodes, and the temperature measurement range is 25–55 °C. Due to the strain suppression afforded by the differential readout, the intrinsically stretchable temperature sensor element achieves an inaccuracy within 1 °C with uniaxial strains from 0-30 %.

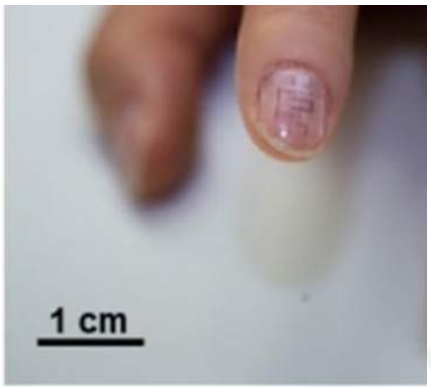


Figure 2. Temperature sensors on finger nail [2]

Various printing methods are used to create a variety of flexible temperature sensors with different structures and outstanding performance. A highly sensitive flexible temperature sensor with a bioinspired octopus-mimicking adhesive is shown in Figure 3. It's a resistor-type temperature sensor consisting of a composite of poly (N-isopropylacrylamide) (pNIPAM)-temperature sensitive hydrogen, poly (3, 4-ethylenedioxythiophene) polystyrene suffocate, and carbon nanotubes. This temperature sensor can be attached to palm which monitors the temperature of range between 25 and 40 °C so that the change in skin temperature of 0.5 °C can be accurately detected. At the same time, the polydimethylsiloxane adhesive layer of octopus-mimicking rim structure coated with pNIPAM is fabricated through the formation of a single mold by utilizing undercut phenomenon in photolithography.

The fabricated sensor shows stable and reproducible detection of skin temperature under repeated attachment/detachment cycles onto skin without any skin irritation for a long time.

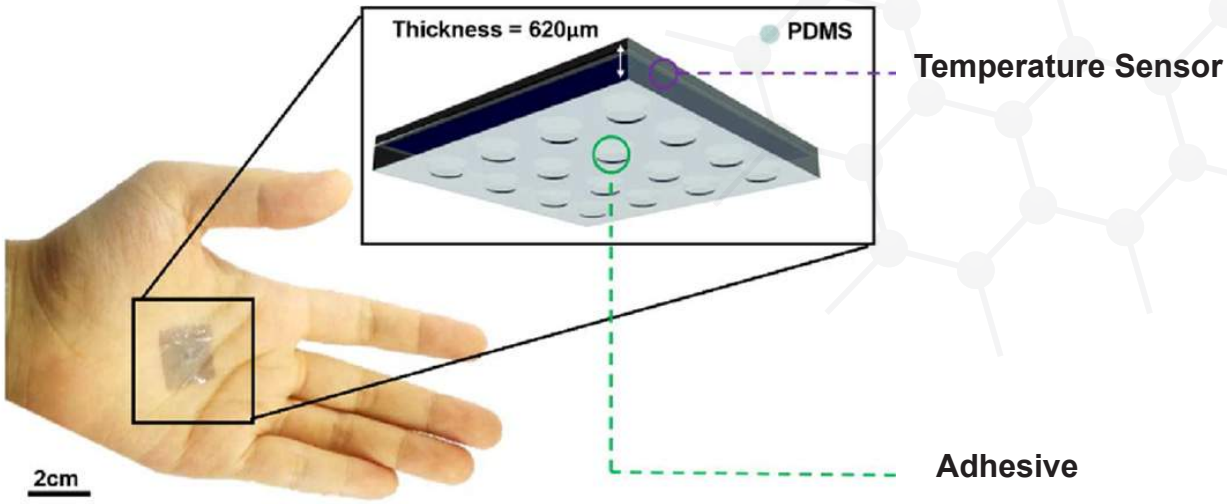


Figure 3. Temperature Sensor attached onto the Palm skin [2]

Pressure Sensors

One interesting finding is a transparent stretchable sensor for measuring mechanical pressure and strain (Figure 4) obtained by spray-coating of carbon nanotubes solution directly on a surface of polydimethylsiloxane (PDMS) substrate. Capacitive sensor sensitivity is carried out by the deformation of the layer from single-walled nanotubes acting as small springs. The sensor allows one to detect up to 50 kPa pressure, which approximately corresponds to the pressure between the two compressed fingertips. This property of transparency is an advantage; however, the sensitivity of the represented sample is considerably lower than of the sensors based on organic field effect transistors (OFETs). The dielectric layer of the printed transistor is made of specially structured rubber which is able to compress and thus may change the electrical properties, making the device sensitive to pressure. The device is capable of providing a sufficiently fast response.

Figure 4. Sensor for measuring mechanical deformation can be stretched in all directions and then take its original shape

Applications

Manufacturing of flexible / stretchable printable temperature sensor, pressure sensor, tactile Sensor etc... are creating new opportunities in wearable electronics, epidermal electronics systems, e skins, epidermal electronic systems, human machine interfaces, soft robotics, education, and other \medical devices. The above mentioned sensors are used for real time health monitoring, especially for patients with chronic diseases.

Summary and Discussions

In this article the highlights of printed flexible/stretchable temperature sensor and pressure sensors are given. The development of flexible sensors shows us a foreseeable future. In the future, flexible and printable sensors will also achieve large-area low-cost fabricating, high sensitivity, self-supply, visualization, self-healing, biodegradability, and wireless remote sensing transmission. Furthermore, other functions are integrated and put into use.

References

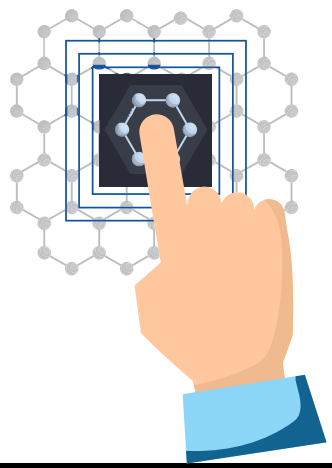
1. A.A.Bessonov and M.N. Kirikova 2015 , ‘ Flexible and Printable sensors’, Nanotechnologies in Russia, Vol.10, Nos. 3-4, pp. 165-180.

2. Yi Su, Chunsheng Ma, Jing Chen, Huiping Wu, Yueming P, Zebang L, Lin L, Yongsong T, Olatunji M O, Zhengfang Z, Lei W and Hui L 2020, ‘Printable, Highly Sensitive Flexible Temperature Monitoring: A Review’ , Nanoscale Research Letters, Vol. 15

3. Kirthika Senthil Kumar, Po-Yen Chen and Hongliang Ren 2019, ‘A Review of Printable Flexible and Stretchable Tactile Sensors’ Research Vol, 19

4. E. T. Ray, “Printed stretch sensor,” US Patent Application No. 13/566,726, 2014.

5. K. Suganuma, Introduction to Printed Electronics, Springer Science & Business Media, 2014.



VISITS AND INTERACTIONS

- Dr. S. Sakthivel Murugan, Asso. Prof. had a meeting with Dr. Felix, Director, Paraprofessional Institute and his team for possible collaboration in the area of animal bio acoustic research on 09.12.2020. Subsequent to this meeting an MoU draft was shared with the team on 30.12.2020.
- Dr. S. Sakthivel Murugan, Asso. Prof. had a meeting with Dr. S. A. Shanmugam, Dean, Institute of Fisheries Postgraduate Studies to discuss collaboration in the area of animal bio acoustic research on 09.12.2020.
- Dr. K. T. Selvan, Prof. had a meeting with Tata Elxsi on 10.12.2020, when colleagues from there briefed about the proposals sent in from SSN. Based on considerations of immediate alignment, TEL has proposed that work on 3 proposals can move forward, with the others to be taken up later.
- Dr. S. Sakthivel Murugan, Asso. Prof. had a meeting with Dr. Akilan/Dean, & Dr. Manikandavelu, Dr. M. G. R. Fisheries College and Research Institute and their team to discuss collaboration in the area of animal bio acoustic research on 24.12.2020.
- Dr. S. Sakthivel Murugan, Asso. Prof. facilitated the execution of a MoU between SSN and Fisheries and Research Institute on 30.12.2020.
- Dr. P. Vijayalakshmi, Prof., as a consultant, discussed with Dr. Shomeshwar Singh, Founder Director, 4S Medical Systems, New Delhi, on the progress made in the project titled “Improving speech visualization using signal processing techniques” on 19.01.2021.
- Dr. S. Sakthivel Murugan, Asso. Prof. scheduled a meeting with Mr. Rangarajan, Director, Nipun Engg. Solutions & Mr. R. Satish from Arobot and discussed the collaboration in the area of underwater test tank establishment, IMU processing kit, international workshop and joint project proposal on 27.01.2021.
- Dr. S. Sakthivel Murugan, Asso. Prof. facilitated the second draft for execution of a MoU signing between SSN and TNFU (Tamil Nadu fisheries University) on 23.01.2021.
- Dr. S. Sakthivel Murugan, Asso. Prof. facilitated the final draft for execution of a MoU signing between SSN and Directorate of Incubation and Vocational Training in Aquaculture (DIVA) on 30.01.2021.
- Dr. N. Prabagarane, Asso. Prof. had a project meeting with Prof. Giacomo Morabito, on 19.01.2021.
- Dr. N. Prabagarane, Asso. Prof. and Dr. R. Kishore, Asso. Prof. had a project meeting with Prof. Dejan Vukobratovic, on 22.01.2021.
- Dr. M. Gulam Nabi Alsath, Asso. Prof. initiated discussions with Saint-Gobain Research India (SGRI) for possible collaboration in the Antenna Engineering Domain. Subsequent to this, a meeting was scheduled on 04.03.2021 with the SGRI team and the achievements made in the domain were presented. Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Dr. S. Kirubaveni, Asso. Prof(s) and Ms. S. Devi Sowjanya, RS attended the meeting.
- Dr. K. T. Selvan, Prof. as part of the ongoing MoU with Tata Elxsi (TEL), had a meeting with two TEL colleagues on 07.05.2021. They discussed scholarship by TEL for SSN students, talks by SSN faculty to TEL colleagues, and the possibility of a 1-credit course to be offered by TEL.

- Dr. N. Prabagarane, Asso. Prof. facilitated the execution of an MoU signing between SSN and the University of Catania on 18.05.2021.
- Dr. S. Sakthivel Murugan, Asso. Prof. facilitated the execution of an MoU signing between SSN and TNFU on 20.05.2021.
- Dr. N. Prabagarane, Asso. Prof. conducted the following virtual meetings with concerned Professors to discuss the progress of the ongoing students' projects.
    a. Prof. Dejan Vukobratovic, University of Novi Sad, Serbia on 06.05.2021.
    b. Prof. Andreas Pitsillides, University of Cyprus, Cyprus on 10.05.2021.
    c. Prof. Gerstacker Wolfgang, University of Erlangen-Nürnberg, Germany on 20.05.2021.
    d. Prof. Pelin Angin, Middle East Technical University, Turkey on 20.05.2021.
    e. Prof. Gino Sorbello, University of Catania, Italy on 25.05.2021.

GUEST SPEAKERS:

- "IoT System Design Methodology" by Mr. Arshdeep Bahga, Founder & Director, DeepLearn Solutions Pvt. Ltd., Chandigarh on Feb. 9th 2021
- "Recent Trends and Innovations in Drone Technology" by Mr. A.J. Arun Jeya Prakash, Director & CEO, Aviocian Technologies Pvt. Ltd., Chennai on Feb. 23rd, 2021
- "5G and Beyond Wireless Ecosystem" by Dr. Prabhu Chandhar, Director, Chandhar Research Labs, Chennai on Mar. 2nd 2021.
- "Noetic Science for Engineering Students" by Mr. Jeyachandran Srinivasan, Director-Knowledge and Learning Services, BRiX Network Pvt. Ltd., Chennai on Mar. 9th 2021.

FACULTY AS GUEST SPEAKERS:

- Dr. V. Vaithianathan, Asso. Prof. "Machine Learning and IoT for Health Care" on 13.11.2020 in the one-week AICTE-ISTE Refresher/Induction Programme on "Machine Learning and IoT" held during Nov. 09-14, 2020 at Sri Indu College of Engineering and Technology, Telangana.
- Dr. M. Gulam Nabi Alsath, Asso. Prof., "Wearable and Implantable Antennas" in the AICTE sponsored ATAL FDP on "Wearable Devices" organized by Karunya Institute of Technology and Sciences on 03.12.2020.
- Dr. M. Gulam Nabi Alsath, Asso. Prof., "Wearable and Implantable Antenna" in the AICTE sponsored STTP on "mmWave Antenna Design and Testing for Biomedical Applications"- Phase 2 organized by Department of ECE, Rajalakshmi Institute of Technology, Chennai on 08.12.2020.
- Dr. V. Vaithianathan, Asso. Prof., "Health Care Applications using IoT" on 13.12.2020 in the one-week AICTE-ISTE Refresher/Induction Programme on "Machine Learning and IoT" held during Dec. 08-14, 2020 at Sri Indu College of Engineering and Technology, Telangana.
- Dr. P. Vijayalakshmi, Prof., "AI and speech disorders - challenges" in six day STTP on "AI in healthcare" conducted by Department of IT, SSNCE from Dec. 14-19, 2020.

- Dr. K. T. Selvan, Prof., "Teaching and learning electromagnetics" at the 17th International Antennas and Propagation Symposium organized by the Cochin University of Science and Technology on 14.12.2020.
- Dr. S. Sakthivel Murugan, Asso. Prof., "Underwater object Detection" in the AICTE sponsored online ATAL STTP on "Research Aspects on Deep Learning in Image and Video Processing" on 19.12.2020 organized by The National Institute of Engineering, Mysuru.
- Dr. V. Vaithianathan, Asso. Prof., "Biomedical Instruments for Healthcare Applications using Machine Learning and Industrial IoT" on 22.12.2020 in the one-week AICTE-ISTE Refresher/ Induction Programme on "Machine Learning and IoT" held during Dec. 16-22, 2020 at Sri Indu College of Engineering and Technology, Telangana.
- Dr. S. Radha, Prof. & Head, "Call for paper writing & research report on innovation" organized by the Innovation Council of PSNA College of Engineering & Technology on 30.12.2020.
- Dr. R. Hemalatha, Asso. Prof., "Sparse Representation for Efficient Image Processing in Resource-Constrained Platforms" in the AICTE-QIP Sponsored Two Weeks Online FDP on "Computer Vision & Image Processing: Research Issues, Innovation and Application - Phase III" conducted by PSNA College of Engineering and Technology, Dindigul on 18.02.2021.
- Dr. W. Jino Hans, Asso. Prof., "Computer Vision and Image Understanding" in the AICTE sponsored two weeks online FDP on "Computer Vision and Image Processing: Research Issues, Innovation, and Application - Phase III" conducted by PSNA College of Engineering and Technology, Dindigul on 19.02.2021.
- Dr. S. Esther Florence, Asso. Prof., "EMI Interference and Compatibility Studies due to On-body Antennas and Sensors" at the E-learning Webinar series at the department of ECE, MAM College of Engineering & Technology, Trichy on 27.02.2021.
- Dr. K. T. Selvan, Prof., "Teaching and learning electromagnetics in modern times" at an AICTE QIP Short Term Course organized by IIT Madras on "Principles and Advances in Electromagnetics" on 24.03.2021.
- Dr. S. Radha, Prof & Head, "IoT and its application in Agriculture" organized by Eswari Engineering College on 10.04.2021.
- Dr. N. Venkateswaran, Prof., "Wireless Technology Beyond 5G" at the 8th National Conference on Advancement in Emerging Technologies" organized by the Department of ECE, Meenakshi Sundararajan Engineering College, Chennai on 10.04.2021.
- Dr. N. Venkateswaran, Prof., "DIP Essentials for MATLAB Programming" for the certificate course on "Complete MATLAB Essentials Leading to Application Development" organized by Sri Venkateswara College of Engineering, Chennai on 17.04.2021.
- Dr. N. Venkateswaran, Prof., "Intelligent Reflecting Surface for Future Wireless Communications" during National Conference on Signal Processing, Communication and Networking organized by Department of ECE, Sri Venkateswara College of Engineering, on 07.05.2021.
- Dr. V. Vaithianathan, Asso. Prof., "IoT and Cloud Computing for Health Care" on 14.05.2021 in the AICTE-ISTE sponsored FDP "IoT and its Applications-Phase III" held in the Department of CSE, Annamalai University.
- Dr. S. Esther Florence, Asso. Prof., "Best practices in Delivering Engaging Virtual Classroom Sessions" at the FDP on "Creative and Innovative Teaching Strategies for the New Normal" organized by SSN-Institute Innovation Council (IIC3.0) on 24.05.2021.

EVENTS ORGANIZED

International Workshop on "Deep Learning Models and its Applications"

Date: Dec. 8-9, 2020
Coordinators: Dr. R. Amutha, A. Jawahar, Prof(s), Dr. P. Kaythry, Dr. C. Vinoth Kumar, Asso. Prof(s).
Speakers: Mr. Adithya Bhardwaj, Machine Learning Engineer, Pluralsight, USA; Dr. Eric Tatt Wei Ho, Senior Lecturer, Faculty of Electrical and Electronics Engineering, Universiti Teknologi PETRONAS, Malaysia; Dr. Allan Melvin Andrew, Senior Lecturer, Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis, Malaysia.

Two-day STTP on "Developments in Smart Systems using Nanomaterials"

Date: Dec. 17-18, 2020
Coordinators: Dr. S. Radha, Prof. & Head, Dr. S. Kirubaveni, Dr. M. Gulam Nabi Alsath & Dr. S. Ramprabhu, Asso. Prof(s).
Speakers: Dr. D. Sastikumar, Professor HAG, Department of Physics, National Institute of Technology, Trichy; Dr.J. Wilson, Asst. Prof., Department of Bioelectronics and Biosensors, Alagappa University, Karaikudi; Dr. G. Ramalingam, Asst. Prof.., Department of Nanoscience and Technology Alagappa University, Karaikudi; Dr. Ramana Reddy, Prof., Department of Physics, Osmania University, Hyderabad.
Participants: 86 faculty participants in the area of Science and Engineering across India

Two-day Workshop on "Autonomous and Unmanned Systems"

Date: Jan. 22-23, 2021
Coordinators: Dr. K. Muthumeenakshi, Dr. S. Esther Florence, Dr. R. Hemalatha, Dr. B. Ramani,Associate Prof(s).
Speakers: Mr. C. Vinoth Kumar, Franchise Head, Chennai Branch, Indian Institute of Drones; Dr. P. A. Manoharan, Director, Robota Technology Innovation Pvt., Ltd., Anna University, CEG Campus, Chennai; Dr. A. Prasanth, Assistant Professor, Department of ECE, PSNA College of Engineering and Technology, Chennai.
Participants: 50 faculty and student participants attended the program

Two-day STTP on "AUV and Smart Systems"

Date: Jan. 29-30, 2021
Coordinators: Dr. S. Radha, Prof & Head, Dr. R. Jayaparvathy, Prof., Dr. R. Rajavel, & Dr. M. Gulam Nabi Alsath, Asso. Prof.
Speakers: Dr.N.Vedachalam, Scientist F : Deep Sea Technologies & HRD In-charge, National Institute of Ocean Technology, Pallikaranai, Chennai; Mr. Lakshmikanth Rajamani, Data Science and AI Consultant, Chennai; Dr.SambunathNandy Sr. Principal Scientist Central Mechanical Engineering Research Institute (CMERI) Mahatma Gandhi Avenue, Durgapur, West Bengal & Mr.Prashanth Mohan Sangem, Data Science Architect, Tata Consultancy Services, Hyderabad.
Participants: 100 faculty participants attended the program

One-day Workshop on "Matlab and App Designer Simulation Tools"

Date: Jan. 30, 2021
Coordinators: Dr. S. Radha, Prof & Head, Dr. K. Muthumeenakshi & Dr. R. Hemalatha, Asso. Prof(s).
Participants: 50 participants attended the program

Two-day workshop on "Assistive Technology - The Challenges"

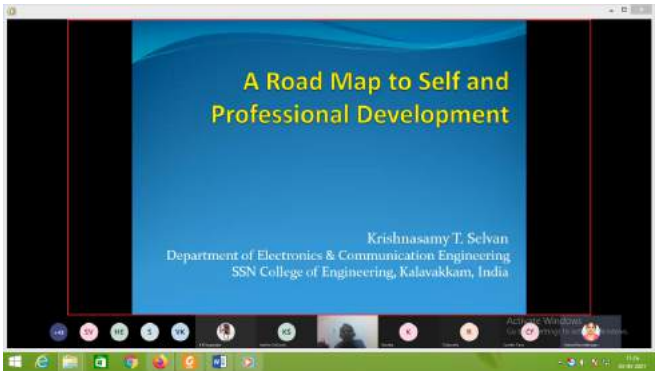
Date: Feb. 15 – 16, 2021
Coordinators: Dr. P. Vijayalakshmi, Prof.; Dr. M. Anbuselvi, Asso. Prof. & Ms. M. Dhanalakshmi, Asst. Prof./BME
Speakers: Dr. M. Balakrishnan, Prof./IIT-M; Dr. Akila Surendran, Senior Engineer, Centre for Assistive Technology and Innovation (CATI) at National Institute of Speech & Hearing (NISH); Mr. Shankar Subbiah, Assistive Technology and Accessibility Consultant, Agate Infotek, Chennai, Ms. Shilpi Kapoor, CEO, Barrier Break Solutions Pvt. Ltd., Mumbai
Participants: 50 participants attended the workshop

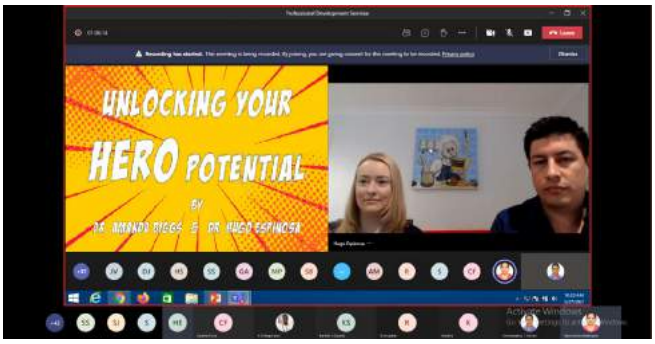
"Interactive session with Successful Start-up founder"

Dr. S. Ramprabhu, Asso. Prof., Dr. N. Venkateswaran, Prof. organized an "Interactive session with Successful Start-up founder" on 13.02.2021.

"Enhancing Skills for Professional Success"

Dr. B. Ramani, Asso. Prof., Dr. K. T. Selvan, Prof. organized a professional development seminar: "Enhancing Skills for Professional Success" in association with the Institution's Innovation Council on 27.02.2021.





"Hands-on Experimentation of Communication System using MATLAB"

Dr. S. Radha, Prof & Head, Dr. K. Muthumeenakshi, Dr. R. Hemalatha, Dr. S. Hanis, Asso. Prof(s). organized a One Day Workshop on "Hands-on Experimentation of Communication System using MATLAB" on 06.03.2021.

"A day with Alumni for future Alumni V4.0"

Dr. S. Sakthivel Murugan, Asso. Prof. organized the one-day Workshop on "A day with Alumni for future Alumni V4.0" on 13.03.2021.

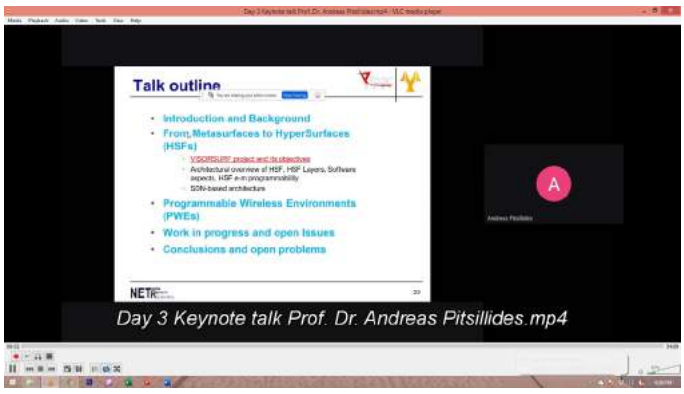
6th International Conference on "Wireless Communications, Signal Processing and Networking (WiSPNET-2021)"

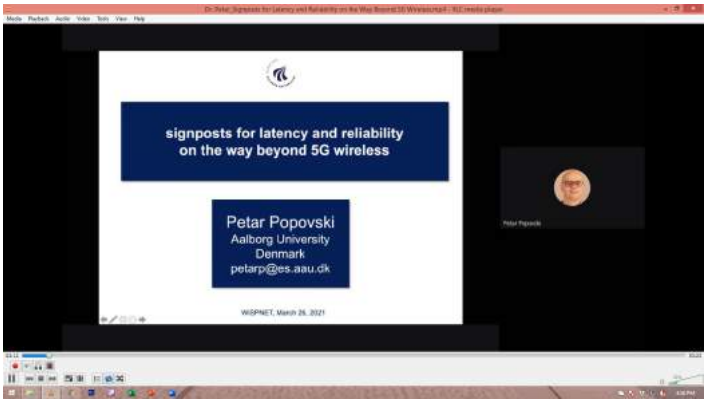
Date: March 25-27, 2021.

Organizing Committee: Dr. S. Radha, Prof & Head was the conference Chair, Dr. N. Venkateswaran, Prof., Dr. W Jino Hans and Dr. N Prabagarane, Asso. Prof. acted as the Organizing chairs for the same.

Keynote Speakers: A total of 11 keynote talks were delivered by eminent speakers. The eminent speakers include Dr. Ian F. Akyildiz, Georgia Institute of Technology, Director of the Broadband Wireless Networking Laboratory and Chair of the Telecommunications Group, Prof. Sasu Tarkoma, Professor of Computer Science at the University of Helsinki and Head of the Department of Computer Science, Prof. Enrico Natalizio, Full Professor, with the LORIA laboratory at the Université de Lorraine (France) and Principal researcher of the Communications and Networking department with the Autonomous Robotics Research Centre in Abu Dhabi, Prof. H. Vincent Poor who is the Michael Henry Strater University Professor at Princeton University, Prof. A. Alphones, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, Dr. Pelin Angin, Assistant Professor of Computer Engineering in Middle East Technical University, Turkey, Prof. Laura Galluccio, Associate Professor at University of Catania, Prof. Petar Popovski who is a Professor in Wireless Communications at Aalborg University, the Department of Electronic Systems, Prof. Yonina Eldar, a Professor in the Department of Mathematics and Computer Science, Weizmann Institute of Science, Rehovot, Israel, Prof. Prof. Dr. Andreas Pitsillides, Professor, Department of Computer Science, University of Cyprus, Cyprus and Prof. Dr. Jaume Anguera, Associate Professor at Ramon Llull University, Spain.

Submissions: A total of 237 submissions were received for WiSPNET 2021. Of these, 94 research papers of high publication standards were presented in this event.

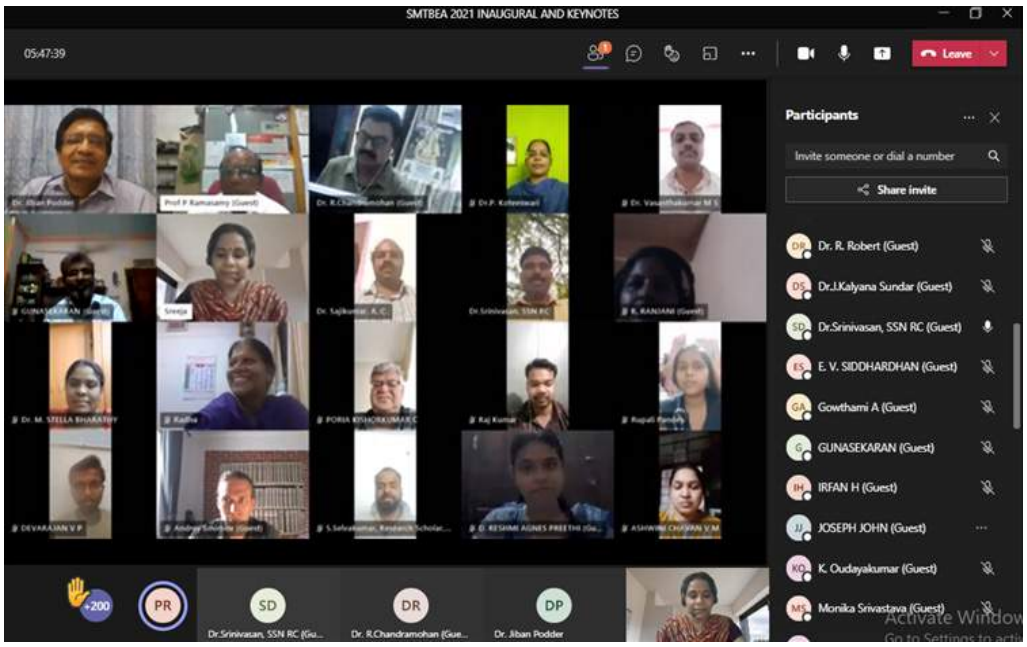




Three-day International Conference on "Sustainable Materials and Technologies for Bio and Energy Applications"

Date: May 19-21, 2021.
Chairmen: Dr. P. Ramasamy, Dean-Research & Dr. S. Radha, Prof. & Head
Conveners: Dr. B. S. Sreeja, Asso. Prof. & Dr. M. Srinivasan, SSNRC
Organizing Committee: Dr. Prita Nair, Prof./Physics, Dr. S. Esther Florence, Dr. S. Kirubaveni, Dr. K. K. Nagarajan, Asso. Prof(s), Dr. P. Karuppasamy & Dr. M. Senthil Pandian, SSNRC.
Keynote Speakers: Prof. Martin A Green, University of New South Wales, Sydney and Director of the Australian Centre for Advanced Photovoltaics, Australia, Prof. P. Ramasamy, SSN Institutions, Chennai, India , Prof. Hedi Mattoussi, Florida State University, USA , Prof. Steve Werely, Perdue University, Prof. Devika Chithrani, University of Victoria, Canada , Dr. Jiban Podder, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh ,Dr. R. Jayavel, Anna University, Chennai, India, Prof. John Philip, Professor, Homi -Bhabha National Institute (HBNI, IGCAR, Kalpakkam), Dr. P Gopinath, IIT Roorkee, India, Dr. Andrei Smirnov, Semiconductor Technology Research Group, St. Petersburg, Russia, Dr. Kentaro Kutsukake, RIKEN, Japan, and Dr. Kensaku Maeda, Institute of Materials Research, Tohoku University, Japan.

Submissions: 170 papers were presented orally. Nearly 500 participants attended the program.

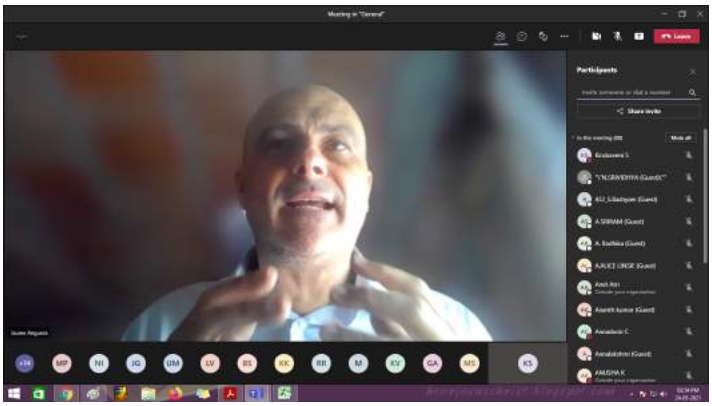


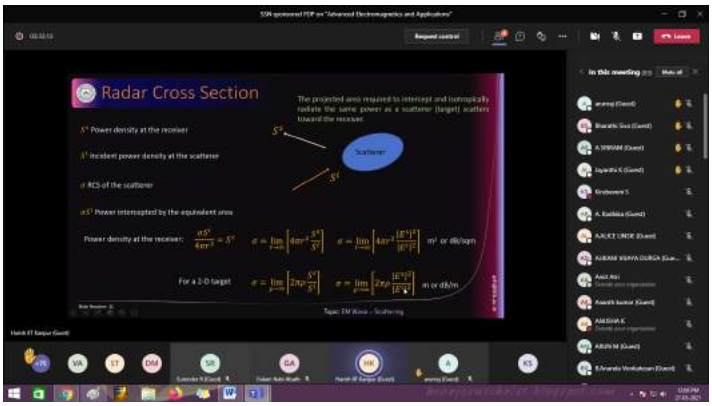
"Space Robotics"

Dr. R. Amutha, Prof., Dr. P. Kaythry & Dr. S. Ramprabhu, Asso. Prof(s) organized a webinar on "Space Robotics" by Dr. Srinivasan Vijayarangan, Senior Research Analyst at Carnegie Mellon University jointly organized by SSN Alumni Association, IEEE ComSoc Student Branch and SSN Institution's Innovation Council on 20.05.2021.

Five-day FDP on "Advanced Electromagnetics and Applications"

Date: May 24-28, 2021
Coordinators: Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Dr. S. Ramprabhu, Dr. S. Kiruba Veni, Asso. Prof(s) and Dr. R. Jayaparvathy, Prof.
Speakers: Dr. A. K. Shrivastav, Scientist-F (Retd), SAMEER; Dr. N. P. Pathak, Prof./IIT-R; Dr. Jaume Anguera, Asso. Prof., URL, Spain; Dr. K. T. Selvan, Prof./SSN; Dr. J. Jayasinghe, Prof., Wayamba University of Sri Lanka; Dr. K. Malathi, Prof./CEG; Dr. V. Subramaniyan, Prof./IIT-M; Dr. S. D. Gupta, Prof., IIT-B; Dr. S. Esther Florence, Asso. Prof./SSN; Dr. K. P. Jayaram, PDF, IIT-M; Dr. A. R. Harish, Prof., IIT-Kanpur, Dr. A. Kavitha, Asso. Prof., IIT-M; Dr. M. J. Akhtar, Prof., IIT-Kanpur.
Participants: 126 participants from various parts of the country.





"Making Sense Out of Restless Brain Activity with Computational Neuroimaging"

Dr. N. Venkateswaran, Prof. organized IEEE Signal Processing Society Distinguished Lecturer program titled "Making Sense Out of Restless Brain Activity with Computational Neuroimaging" by Professor Dr. Dimitri Van De Ville, Professor of Bioengineering, Center for Biomedical Imaging, Department of Radiology and Medical Informatics, University of Geneva, Switzerland on 25.05.2021.

EVENTS ATTENDED

- Dr. N. Venkateswaran, Prof. attended the two weeks online FDP on, “Indian Knowledge Systems in Contemporary Education & Practices” organized in Collaboration with Centre for Professional Development in Higher Education (CPDHE), UGC-HRDC, Delhi University, Supported by ICSSR and AICTE during Nov. 05-19, 2020.
- Dr. B. S. Sreeja, Asso. Prof. successfully completed the ATAL Online FDP on “Micro Electro-Mechanical Systems” organized by Sardar Patel College of Engineering, Andheri (West) during Nov. 23-27, 2020.
- Dr. C. Annadurai, Dr. S. Kirubaveni, Dr. I. Nelson, Asso. Prof(s) successfully completed the ATAL Online FDP on “Wearable Devices” organized by Karunya Institute of Technology and Sciences from 30.11.2020 to 04.12.2020.
- Dr. S. Karthie, Asso. Prof. attended an international webinar on “Filter Design Tools for Synthesis, Modelling & Optimization” organized by Dassault Systemes on 02.12.2020.
- Dr. C. Annadurai, Dr. M. Anbuselvi, Dr. I. Nelson, Asso. Prof(s) successfully completed the ATAL Online FDP on “Artificial Intelligence” organized by Sri Sairam Engineering College, Chennai during Dec. 07-11, 2020.
- Dr. B. Ramani, Dr. R. Kishore, Dr. W. Jino Hans, Asso. Prof(s) participated and successfully completed the ATAL Online FDP on “Sensors Technology” organized by Thiagarajar Polytechnic College, Salem during December 07-11, 2020.
- Dr. N. Edna Elizabeth, Prof. successfully completed the ATAL Online FDP on “Internet of Things (IoT)” organized at SRM Institute of Science and Technology from Dec. 07-11, 2020.
- Dr. S. Karthie, Asso. Prof. participated in an international webinar on “Analog Photonic Systems: Features & Techniques to Optimize Performance” organized by IEEE MTT-S on 08.12.2020.
- Dr. A. Jawahar, Prof. successfully completed the ATAL Online FDP on “Internet of Things (IoT)” organized by Birla Vishvakarma Mahavidyalaya Engineering College, Gujarat during Dec. 14-18, 2020.
- Dr. M. Anbuselvi, Asso. Prof. successfully completed the ATAL Online FDP on “Robotics” organized by Ramrao Adik Institute of Technology, Mumbai during Dec. 14-18, 2020.
- Dr. C. Vinoth Kumar, Asso. Prof., Dr. R. Amutha, Prof. successfully completed the ATAL Online FDP on “Precision Health Technology” organized by Thiagarajar College of Engineering, Madurai during Dec. 14-18, 2020.
- Dr. S. Hanis, Asso. Prof. successfully completed the ATAL Online FDP on “Cyber Security” organized by Kongu Engineering College, Erode during Dec. 14-18, 2020.

- Dr. G. Durga, Asso. Prof. attended the FDP on “Modeling, Simulation and Fabrication of Futuristic Semiconductor, MEMS and NEMS Devices” organized by KL University during Dec. 14-19, 2020.
- Dr. M. Gulam Nabi Alsath, Asso. Prof. successfully completed the AICTE sponsored six-day STTP on “AI for Healthcare” organized by SSN College of Engineering, Chennai during Dec. 14-20, 2020.
- Dr. C. Annadurai, Dr. S. Karthie, Dr. P. Kaythry, Asso. Prof(s) participated in the STTP on “Developments in Smart Systems Using Nanomaterials” organized by the Department of ECE, SSNCE during Dec. 17-18, 2020.
- Dr. K. T. Selvan, Prof. attended a webinar on “360-degree feedback” organized by AICTE on 23.12.2020.
- Dr. P. Vijayalakshmi, Prof. attended the India International Science festival - conclave on Assistive Technologies and Divyangjan on 23rd and 24th Dec. 2020.
- Dr. P. Kaythry, Asso. Prof. attended a webinar on “Why Python is great for Machine Learning?” on 29.12.2020.
- Dr. P. Kaythry, Asso. Prof. attended a webinar on “Understanding the Spirit-Mind-Brain-Body link for a better life” organized by CSI Chennai chapter on 29.12.2020.
- Dr. V. Vaithianathan, Asso. Prof. successfully completed the ATAL Online FDP on “Wearable Devices” organized by Vignan Institute of Technology and Science during Jan. 4-8, 2021.
- Dr. S. Karthie, Asso. Prof. participated in an international webinar on “Terahertz Communications at 300 GHz: Devices, Packages and System” organized by IEEE MTT-S on 12.01.2021.
- Dr. N. Edna Elizabeth, Prof. & Dr. S. Esther Florence, Asso. Prof. attended a 3-day National Workshop on “Examination Reforms” organized by AICTE and KLE Technological University, Hubballi during Jan. 15-18, 2021.
- Dr. V. Vaithianathan, Asso. Prof. participated and successfully completed the ATAL Online FDP on “BlockChain” organized by Excel Engineering College during Jan. 18-22, 2021.
- Dr. S. Sakthivel Murugan and Dr. M. Gulam Nabi Alsath, Asso. Prof(s). attended a two-day workshop on “Autonomous and Unmanned Systems” organized by the Department of ECE, SSNCE during Jan. 22-23, 2021.
- Dr. B. Ramani, Dr. P. Kaythry, Dr. S. Sakthivel Murugan, Asso. Prof(s). & Dr. N. Edna Elizabeth, Prof. attended the STTP on “AUV and Smart Systems” organized by Department of ECE, SSNCE during Jan. 29-30, 2021.
- Dr. N. Venkateswaran, Prof. successfully completed the online training program, “Massive MIMO & mmWave Communications” during Dec. 21-24, 2020 conducted by Thiagarajar College of Engineering, Madurai.
- Dr. R. Rajavel, Asso. Prof. completed the ATAL Online FDP on “Internet of Things (IoT)” organized by Kongunadu College of Engineering and Technology, Trichy during Jan. 25-29, 2021.

- Dr. V. Vaithianathan, Asso. Prof. successfully completed the ATAL Online FDP on “Artificial Intelligence, Machine Learning and Deep Learning” organized by University Visvesvaraya College of Engineering, Bangalore during Feb. 01-05, 2021.
- Dr. S. Karthie, Asso. Prof. attended an international webinar on “Battery-free RF/Microwave Systems” organized by IEEE MTT-S on 09.02.2021.
- Dr. P. Kaythry, Asso. Prof. attended 12-day FDP on “Responsibility of higher Education Institutions under AICTE in Implementing Sustainable Development Goals” organized by Sri Sairam Institute of Technology during Feb. 11-24, 2021.
- Dr. B. Ramani, Asso. Prof. attended a two-day workshop on “Assistive Technology - The Challenges” organized by SSN College of Engineering during Feb. 15-16, 2021.
- Dr. G. Durga, Asso. Prof. participated & completed ATAL FDP titled “Wearable Devices” conducted by Anna University during Feb. 15-19, 2021.
- Dr. A. Jawahar, Prof. attended an orientation webinar on “NBA accreditation for all Margdarshaks & MI’s” organized by AICTE in collaboration with NBA on 17.02.2021.
- Dr. A. Jawahar, Prof. attended a National webinar on “Designing AI for the IoT Systems” organized by NITTTR, Chennai in association with Opti Thought on 18.02.2021.
- Dr. C. Vinothkumar, Asso. Prof. attended “ISO 9001:2015 Internal Auditor Training Program” during Feb. 22-23, 2021.
- Dr. N. Edna Elizabeth, Prof. successfully completed the Online FDP on “Emerging Research Trends on Battery and Electric Vehicle Technology” organized by SSN College of Engineering during February 24-25, 2021.
- Dr. P. Kaythry, Asso. Prof. attended the professional development seminar “Enhancing Skills for Professional Success” on 27.02.2021.
- Dr. P. Vijayalakshmi, Prof. attended the EMPOWER-IUA Workshop on “Inclusive Higher Education Best Practices” conducted by IIIT-B on 27.02.2021.
- Dr. S. Karthie, Asso. Prof. attended the professional development seminar on “Enhancing Skills for Professional Success” organized by the Department of ECE, SSN CE in association with Institution’s Innovation Council on 27.02.2021.
- Dr. R. Jayaparvathy, Prof. successfully completed the AICTE -ATAL Online FDP on IoT conducted by Kongu Engineering College during Dec. 21-25,2020
- Dr. R. Jayaparvathy attended the NBA Orientation Program for Evaluators and Team Chairs on directions from NBA on Feb. 01, 2021
- Dr. R. Jayaparvathy attended the 3 Days Online Training Programme on Environment, Biodiversity and Disaster Risk Reduction during 24-26 February 2021 organized by TFRI, Jabalpur under MoEFCC

- Dr. N. Venkateswaran, Prof. participated in a 10-days short term course on “Advancements in Signal Processing and Artificial Intelligence in Healthcare (ASPAIH) 2021” conducted by the Department of Electronics and Communication Engineering, IIITDM Kancheepuram between Feb. 15-24, 2021.

- Dr. N. Edna Elizabeth, Prof. participated and completed the Online FDP on “Emerging Research Trends on Battery and Electric vehicle Technology” organized by SSN College of Engineering during Feb. 24-25, 2021.

- Dr. S. Karthie, Asso. Prof. attended the professional development seminar on “Enhancing Skills for Professional Success” organized by the Department of ECE, SSN CE in association with the Institution’s Innovation Council on 27.02.2021.

- Dr. M. Anbuselvi, Asso. Prof. attended the National Supercomputing Mission’s Workshop on “ARM-based HPC” organized by C-DAC and the NSM Nodal Centres for Training in HPC and AI at IITs Goa, Kharagpur, Madras, Palakkad online during Mar. 2-3, 2021.

- Dr. C. Vinothkumar, Asso. Prof. attended the Workshop on “Image classification using Deep Neural Networks” organized by the Department of IT, SSN CE during March 11-12, 2021.

- Dr. M. Anbuselvi, Asso. Prof. attended the one-day workshop on “Structural, Thermal and Dynamic analysis using ABAQUS Software” organized by the Department of Mechanical Engineering, SSN CE on 13.03.2021.

- Dr. S. Radha, Prof. & Head attended a virtual workshop titled “5G testbed” on 05.04.2021, organized by IITM.

- Dr. A. Jawahar, Prof. attended a webinar on “Why IP is important in academia?” by Dr. Abhay Jere, Chief Innovation Officer, MoE’s Innovation Cell & Dr. Mohit Gambhir, Innovation Director, MoE’s Innovation Cell on 26.04.2021.

- Dr. A. Jawahar, Prof attended AICTE Talk on “Empathetic and techno-pedagogical approaches for the new-normal” on 04.05.2021.

- Dr. M. Gulam Nabi Alsath, Asso. Prof. attended the “Orientation Program for Coordinators - Online ATAL FDPs 2021-22” organized by ATAL Academy AICTE on 11.05.2021.

- Dr. R. Hemalatha, Asso. Prof. attended the live National Technology day webinar organized by IEEE IAS, IEEE TEMS and L&T Smart world on 11.05.2021.

- Dr. C. Vinoth Kumar, Asso. Prof. attended a webinar on “SSR Preparation: Understanding the Manual and SOP- Part A; Criteria 7 & other important aspects” conducted by NAAC on 17.05.2021.

- Dr. P. Kaythry, Asso. Prof. attended the National level symposium on “Accelerating Digital Transformation in Challenging Times” organized by IETE, New Delhi on 17.05.2021. She also attended an online meeting on “Elsevier’s Research Reference Books” conducted by Elsevier on 21.05.2021.

- Dr. C. Vinoth Kumar, Asso. Prof. attended a webinar on “Outcome-Based Education” conducted by NAAC on 18.05.2021.
- Dr. R. Amutha, Dr. N. Edna Elizabeth, Prof(s)., Dr. P. Kaythry, Dr. S. Ramprabhu, Dr. G. Durga, Asso. Prof(s)., attended a webinar on “Introduction to Intellectual Property rights (IPR), Types and examples” organized by the Institution’s Innovation council of SSNCE on 19.05.2021.
- Dr. C. Vinoth Kumar, Asso. Prof. attended webinars conducted by NAAC on 20th and 21st May 2021.
- Dr. N. Venkateswaran, Prof. participated in the “Health and Wellness Program 2021” session on Meditation conducted by IEEE Bangalore Section on 26.04.2021.
- Dr. P. Kaythry, Asso. Prof. attended an International webinar on “Evolutionary Learning and its Engineering Applications” organized by IEEE Student Branch-GSSS Institute of Engineering and Technology for Women, Mysuru in association with IEEE Mysore Sub Section and IEEE Bangalore Section on 21.05.2021.
- Dr. I. Nelson, Dr. C. Annadurai, Dr. C. Vinothkumar, Dr. S. Karthie, Dr. K. J. Jegadish Kumar, Dr. B. Partibane, Asso. Prof(s), attended the 5-day FDP on “Advanced Electromagnetics and Applications” organized by the Department of ECE, SSNCE during May 24-28, 2021.
- Dr. P. Vijayalakshmi, Prof., Dr. M. Anbuselvi, Asso. Prof. attended 5-day ATAL FDP on “Productivity Enhancement through Meditation” from May 24-28, conducted by JECRC, Jaipur.
- Dr. P. Kaythry, Asso. Prof. attended the FDP on “Creative and Innovative Teaching Strategies for the New Normal” organized by SSN-Institute Innovation Council (IIC3.0) during May 24-31, 2021.
- Dr. P. Kaythry, Asso. Prof. attended the IEEE Smart cities webinar, “Everything You Wanted to Know about Smart Healthcare” on 25.05.2021.
- Dr. N. Prabagarane, Asso. Prof. attended the IET Sponsored Faculty Development Programme on “5G Wireless Communications” organized by TCE, Madurai on 26.05.2021.
- Dr. S. Sakthivel Murugan, Asso. Prof. attended two days webinar on “Image Dehazing” organized by Mohamed Sathak A.J. College of Engineering on May 27-28, 2021.
- Dr. N. Prabagarane, Asso. Prof. attended the Expert Training on IoT and Cloud/Edge organized by Aalborg University, Denmark in May 2021.
- Dr. R. Hemalatha, Asso. Prof. attended the webinar on “Mental Health” organized by The IIC (Institution’s Innovation Council), SSNCE and Association of Information Technologist/ IT on 28.05.2021.
- Dr. P. Kaythry, Asso. Prof. attended the webinar on “Education, Research and Innovation: The changing roles of a twenty-first-century university” by Dr. Ramgopal Roa, Director IIT Delhi organized by IEEE India Council, Delhi Chapter on 28.05.2021.

TECHNICAL STAFF SKILL DEVELOPMENT

- Mr. D. Sundaravadivel, Ms. V. Metha Devi, Mr. G. Subramaniam & Mr. S. Murugan attended the webinar on "Evolution from Networking to Software Defined Networking" organized by Karunya Institute of Technology and Sciences, Coimbatore on 07.12.2020.

- Mr. D. Sundaravadivel completed two online courses "Introduction to Basic Electronics" and "Computer Networking" Application Layer" on Alison.

- Ms. V. Metha Devi completed the following online courses through Alison.
  - **a.** Introduction to Digital Circuits
  - **b.** Introduction to Basic Electronics
  - **c.** Winning with Communication - Master Your Communication Skills
  - **d.** Solar Energy - Solar Technology and Its Use Worldwide
  - **e.** English Course - Word Forms (Upper-Intermediate Level)

- Mr. D. Sundaravadivel completed the following online courses on Alison.
  - **a.** Introduction to Digital Circuits
  - **b.** Introduction to Communication Skills
  - **c.** Introduction to Diode Circuits
  - **d.** Fundamentals of Internet of Things
  - **e.** Introduction to Optical Engineering
  - **f.** Arduino and programming Internet of things

- Mr. D. Sundaravadivel attended a 2-day online Workshop on "5G Wireless Communication" by Rajiv Gandhi Arts & Science College, Puducherry on 22-23 Feb., 2021. He also attended the webinar "Enabling Technologies for Future Wireless Communication" by AISSMS College Engineering, Pune on 01.03.2021 & 02.03.2021.

- Ms. V. Balasubathra attended the "Data Science" & "Cyber Security" webinars organized by Pantech.

- Mr. E. Kumaresan completed the following online courses on Alison.
  - **a.** Administrative Procedures and Support in the Office
  - **b.** C# Programming - Coding with C# Syntax - Revised
  - **c.** Introduction to C and Assembly language programming
  - **d.** Introduction to Embedded Systems

- Mr. S. Murugan attended the "Workshop on Antennas" on 17.03.2021 organized by Angel Institute of Technology & Design, Goa.

- Ms. A. Mahalakshmi completed the online course "Embedded systems: project development" through Alison.

- Mr. D. Sundaravadivel attended workshops on “Embedded Systems” organized by Meenakshi College of Engineering in association with Pantech E-Learning on 17-18 May 2021; Fundamental of “Arduino and its Application” organized by PG College for Women, Chennai on 21.05.2021 and “5G Technologies” organized by SNS College of Engineering, Coimbatore on 25.05.2021.

- Mr. G. Subramaniyan attended 2-day Workshop on “Embedded Systems” organized by Meenakshi College of Engineering in association with Pantech E-Learning on 17-18 May, 2021.

- Ms. V. Balasubathra attended the following online skill upgradation program by AMET University Chennai.
  - **a.** “Communication skills in workplace” on 24-25 May 2021.
  - **b.** “Safety measurements” on 26.05.2021.
  - **c.** “Excel made Easy” on 27.05.2021.
  - **d.** “Basic Networking” on 28.05.2021.

- Mr. E. Kumaresan attended the following workshops during May 2021
  - **a.** “Artificial Intelligence” on 30.04.2021 & 01.05.2021.
  - **b.** “Robotics Vision” on 07-08 May 2021.
  - **c.** “Python Programming” organized by MTM College of Arts Science and Commerce on 17.05.2021.
  - **d.** “Mobile Android App Development” organized by Government Polytechnic, Ambad Dist, Jalna on 19.05.2021.
  - **e.** “Machine Learning” organized by Guntur Engineering College on 21.05.2021.

- Ms. P. Nalitha attended the following online skill upgradation program by AMET University, Chennai.
  - **a.** “Communication skills in workplace” on 24-25 May 2021.
  - **b.** “Safety measurements” on 26.05.2021.
  - **c.** “Excel made Easy” on 27.05.2021.
  - **d.** “Basic Networking” on 28.05.2021.

ONLINE COURSES

- Dr. N. Edna Elizabeth, Prof. completed an online course titled “Symmetric Cryptography” authorized by Rhyme on Coursera.

- Dr. P. Kaythry, Asso. Prof. completed a 15-week online course on “Information Theory” offered by The Chinese University of Hong Kong on Coursera.

- Dr. G. Durga, Asso. Prof. completed the following two NPTEL online certification courses:
  - **a.** CMOS Digital VLSI Design and received an Elite certificate.
  - **b.** Digital IC Design and received a certificate from NPTEL.

- Dr. P. Kaythry, Asso. Prof. completed and received a passing grade in “PH278.Ax: The Health Effects of Climate Change” a course of study offered by HarvardX, an online learning initiative of Harvard University.

PROFESSIONAL ROLES AND RECOGNITIONS

1. Dr. R. Rajavel, Asso. Prof. as DC member attended the PhD Research Advisory Committee meeting of Mr. M. S. Muhammadu Sathik Raja, a research scholar of VISTAS, Pallavaram on 11.12.2020.

2. Dr. R. Jayaparvathy, Prof. conducted the Online DC Meeting for Confirmation of the Ph.D Scholar Mr. S. Vinothkumar on 18.12.2020.

3. Dr. B. Ramani, Asso. Prof. as external expert attended the first DC meeting of Ms. Thillai Sivakavi, a research scholar of SRMIST, Kattankulathur on 19.12.2020. She also attended the confirmation DC meeting of Ms. J. Abanah Shirley on 30.12.2020.

4. Dr. S. Radha, Prof. & Head and Esther Florence, Asso. Prof. received the IEEE publication award at the Annual General Body (AGM) meeting of the IEEE Madras Section held on 19.12.2020.

5. Dr. V. Vaithianathan, Asso. Prof. as the external DC member conducted the synopsis meeting of the research scholar Mrs. Jeneetha Jebanazer, research scholar of Dr. M. G. R. Educational and Research Institute on 21.12.2020.

6. Dr. M. Gulam Nabi Alsath, Asso. Prof. attended the DC meeting of a research scholar registered at SRM IST, Kattankulathur on 29.12.2020.

7. Dr. B. S. Sreeja, Asso. Prof. as an expert member attended the synopsis meeting of Ms. Akshaya, Research scholar of SRM University on 19th Dec 2020.

8. Dr. R. Amutha & Dr. A. Jawahar, Prof(s). conducted the viva-voce for their respective research scholars on the 11th and 15th of Dec. 2020.

9. Dr. S. Radha, Prof & Head conducted the Final DC meeting to evaluate the examiner's report for her full-time SSN JRF research scholar Ms. R. Indhu on 18.12.2020. The viva-voce examination for the scholar was conducted on 12.01.2021.

10. Dr. M. Gulam Nabi Alsath, Asso. Prof. conducted the Synopsis DC Meeting for his full-time research scholar, Ms. S. Devisowjanya on 23.12.2020. He also conducted the SRF promotion interview for his DST-SERB funded JRF, Ms. S. Vidhya Shree on 23.12.2020.

11. Dr. N. Venkateswaran, Prof. conducted the synopsis meeting for his Ph.D. Scholar Mrs. V. Angeline Beulah on 26.12.2020. He also attended the confirmation meeting for a part-time research scholar registered at SRM University on 30.12.2020.

12. Dr. K. T. Selvan, Prof. made a presentation, along with Dr. V. Lingasamy (HCL Technologies, formerly JRF on the project), on the completed ISRO-RESPOND project at the online annual review meeting held on 08.12.2020.

13. Dr. N. Venkateswaran, Prof. acted as external examiner for dissertation and project viva examination for PG Applied Electronics students of CEG, Guindy on 14.12.2020.

14. Dr. S. Esther Florence, Asso. Prof., as a DC member, attended the first DC meeting for the scholar Mr. V. Beslin Geo under the supervision of Dr. C. Kezi Selva Vijila at the Department of ECE, Hindustan Institute of Technology & Science, Chennai on 02.02.2021.

15. Dr. R. Amutha, Prof., as a DC member, attended the confirmation DC meeting for the Part-time SSN research scholar, Mr. S. Surdharsan, Research Scholar of Dr. R. Hemalatha, Asso. Prof. on 05.01.2021. She also attended the DC Meetings of the scholars registered at SRM Institute during Jan. & Feb. 2021.

16. Dr. P. Vijayalakshmi, Prof. as a University nominee attended the Board of Studies meeting of Government college of Engineering, Bargur on 08.01.2021, through online mode.

17. Dr. M. Gulam Nabi Alsath, Asso. Prof. attended the DC meeting held at S. A. Engineering College on 25.01.2021.

18. Dr. R. Amutha, Prof. conducted the final DC meeting for her full-time research scholar, Ms. R. Ponuma on 13.01.2021. The PhD viva voce was conducted on 25.02.2021.

19. Dr. S. Radha, Prof & Head conducted the synopsis meeting for her full-time research scholar, Ms. D. Kanchana on 23.01.2021. She also conducted the first DC Meeting for her full-time research scholar, Ms. V. Shyamala on 27.01.2021.

20. Dr. M. Gulam Nabi Alsath, Asso. Prof. conducted the first DC Meeting for his full-time research scholar, Ms. S. Vidhyashree on 24.01.2021.

21. Dr. R. Amutha, Prof. reviewed a paper each submitted to journals “Chaos, Solitons, and Fractals” & “Journal of Ambient Intelligence and Humanized Computing”

22. Dr. C. Annadurai, Asso. Prof. reviewed a paper each for Elsevier’s Computer Networks, Springer’s Quality and User Experience journal & Cluster Computing.

23. Dr. C. Vinothkumar, Asso. Prof. reviewed papers for the International Conference on Biosignals, Images and Instrumentation 2021 and an article for the Journal of Artificial Intelligence Review.

24. Dr. R. Amutha, Prof. & Dr. R. Hemalatha, Asso. Prof. acted as evaluator for Toycathon and evaluated ideas.

25. Dr. N. Venkateswaran, Prof., as a DC member attended the DC meetings for scholars registered under SRM-IST during Jan. & Feb. 2021.

26. Dr. K. Muthumeenakshi, Asso. Prof. attended the PhD Comprehensive viva meetings as an External Expert for the research scholars of SRM IST during Jan. & Feb. 2021.

27. Dr. A. Jawahar, Prof., as a DC member attended the DC meeting for scrutinizing the thesis report of Mr. N. Prabhakaran on 02.02.2021.

28. Dr. C. Annadurai, Asso. Prof., as DC member, attended the DC meeting conducted by Dr. B. Umarani, Prof., Kongunadu College of Engineering and Technology, Trichy for her scholar Ms. K. Yazhini on 04.02.2021.

29. Dr. S. Sakthivel Murugan, Asso. Prof. attended the DC meeting for Ms. Jenifer Sofia and Ms. Mary Shyni full-time research scholars in SRM University, Kattankulathur campus during Feb. 2021.

30. Dr. P. Vijayalakshmi, Prof., as a subject expert, attended DC meeting of Mr. Srinivasan, SRM IST, PhD student of Dr. Vivekmaik on 18.02.2021.

31. Dr. S. Esther Florence, Asso. Prof. is recognized and elevated to Senior Member Grade in IEEE on 24.02.2021.

32. Dr. S. Ramprabhu, Dr. I. Nelson, Dr. K. K. Nagarajan & Dr. G. Durga Asso. Prof(s). conducted the first DC meetings for their respective research scholars during Jan. & Feb. 2021.

33. Dr. S. Esther Florence, Asso. Prof. conducted the Synopsis DC Meeting for her full-time research scholar, Ms. Sumana on 15.02.2021.

34. Dr. A. Jawahar, Prof. reviewed a paper for ICBSII 2021.

35. Dr. K. Muthumeenakshi, Asso. Prof. reviewed a paper for the Journal “Fluctuations and Noise Letters”.

36. Dr. K. T. Selvan, Prof. & Dr. M. Gulam Nabi Alsath, Asso. Prof. reviewed papers for the IEEE Antennas and Wireless Propagation Letters.

37. Dr. B. Ramani, Asso. Prof. reviewed a paper for the conference FSDM 2021.

38. Dr. A. Jawahar, Prof. attended the final evaluation meeting for evaluation of the proposal for Mentor Institute held on 03.02.2021.

39. Dr. S. Radha, Prof & Head, Dr. M. Gulam Nabi Alsath, Asso. Prof., Dr. R. Seyezhai, Asso. Prof./ EEE, Dr. S. Sureshkumar, Asso. Prof./Mech & Mr. Anandaraman, Assistant Marketing Manager, attended a patent vendor fixation meeting on 18.02.2021.

40. Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Asso. Prof., Dr. R. Seyezhai, Asso. Prof./ EEE, Dr. S. Sureshkumar, Asso. Prof./Mech, The Principal & Mr. Anandaraman, Assistant Marketing Manager and Ms. Indumathi, KIM patents attended patent vendor fixation meeting on 19.02.2021.

41. Dr. N. Venkateswaran, Prof. gave his adjudication of the PhD thesis in the area of “Image Retrieval Technique Capturing Multiple Semantics” submitted for award under Calicut University.

42. Dr. S. Radha, Prof. & Head attended the DC meeting virtually for the candidate registered at RMD College of Engineering, Chennai on 03.03.2021.

43. Dr. K. T. Selvan, Prof. attended the Board of Studies meeting of the ECE Department of Kongunadu College of Engineering and Technology, as the University nominee, on 11.03.2021.

44. Dr. M. Gulam Nabi Alsath, Asso. Prof. conducted the Synopsis DC Meeting for his part-time research scholar, Ms. V. Aruna on 17.03.2021.

45. Mr. C. Ganesh Kumar, RS under the guidance of Dr. Premanand V. Chandramani, Prof. successfully defended his thesis on the topic “Energy Management in Residential Communities

through automated Demand Response (DR)" on 19.03.2021.

46. Dr. S. Radha, Prof. & Head conducted the synopsis seminar for her part-time research scholar Mr. K. A. Karthikeyan, on 30.03.2021.

47. Dr. S. Radha, Prof & Head as a Chairman, BoS, ECE along with others conducted the 3rd BoS meeting on 29.03.2021.

48. Dr. S. Sakthivel Murugan, Asso. Prof. reviewed a paper each for WiSPNET 2021 & ICCCSP 2021.

49. Dr. S. Sakthivel Murugan, Asso. Prof. is elected as Executive Committee (EC) Member for Ocean Society of India (OSI), Chennai chapter for the year 2021-2022.

50. Dr. C. Annadurai, Asso. Prof. reviewed a paper each for the journal Cluster Computing & WJST journal.

51. Dr. S. Karthie, Asso. Prof. reviewed two papers for the International Conference WiSPNET 2021 and a paper for the journal Microprocessors and Microsystems.

52. Dr. P. Vijayalakshmi, Prof. evaluated four project proposals submitted to DST & ICAR.

53. Dr. K. Muthumeenakshi, Asso. Prof. reviewed a paper for the International Conference ICCCSP 2021.

54. Dr. B. Ramani, Asso. Prof. reviewed a paper for the conference ICSPC 2021 organized by Karunya Institute of Technology & Sciences, Coimbatore.

55. Dr. R. Hemalatha, Asso. Prof. as DC member attended the virtual DC meeting for the candidate registered at VIT University, Chennai on 09.04.2021.

56. Dr. N. Venkateswaran, Prof. attended the Second BoS Meeting at Sri Manakula Vinayagar Engineering College, Pondicherry on 10.04.2021.

57. Dr. R. Amutha, Prof. attended the synopsis meeting for the scholar Ms. R. Vinodhini at SRM University on 15.04.2021.

58. Dr. S. Radha, Prof & Head as an expert member conducted NBA mock at SRM University for ECE & EEE department on 16.04.2021.

59. Dr. S. Radha, Prof & Head as an external auditor conducted an Academic audit for the IT department of Sri Sairam Engineering College, Chennai on 23.04.2021.

60. Dr. C. Annadurai, Asso. Prof. as a DC member attended the virtual DC meeting of Mr. E. Purusothaman, Scholar of Dr. V. Nagarajan Prof/ECE, APEC on 26.04.2021.

61. Dr. B. S. Sreeja, Asso. Prof. as a DC member attended the synopsis Meeting of research scholar Ms. A. Elakkiya, FT RS of Dr. S. Radha, Prof. & Head on 29.04.2021.

62. The tenure of Dr. P. Vijayalakshmi, Prof. as a Margadharshak is extended till September 2021,

by AICTE, New Delhi.

63. Dr. N. Venkateswaran, Prof. along with VIT University, Vellore organized an FDP titled "Advances in Signal Processing" on 05.04.2021.

64. Dr. S. Radha, Prof. & Head, Dr P. Jagadambal, Prof./KIST, Coimbatore along with other expert members attended SRF interview meeting virtually for the candidate selection of the sponsored project on 09.04.2021.

65. Dr. C. Annadurai, Asso. Prof. reviewed a paper for Cluster Computing, Springer journal.

66. Dr. N. Prabagarane, Asso. Prof. as an Associate Editor of the IET Communications and Physical Communication journals handled the review process of the papers assigned by the respective editors.

67. Dr. R. Amutha, Prof. and Dr. B. Ramani, Asso. Prof. reviewed papers for the International conference ICCCSP 2021 organized by the IT Department of SSNCE.

68. Dr. B. Ramani, Asso. Prof. reviewed a paper for the 5th International Conference on Interdisciplinary Computer Science and Engineering 2021 to be organized by Universiti Putra Malaysia, Selangor, Malaysia.

69. Dr. P. Vijayalakshmi, Prof. as a DC member, attended thesis report review DC meeting of Mr. Senthilkumar, a scholar of Dr. L. Sujatha, Rajalakshmi Engineering College on 08.05.2021.

70. Dr. S. Esther Florence, Dr. S. Kirubaveni & Dr. K. K. Nagarajan, Asso. Prof(s) acted as a session chair during the 3 days "International Conference on Sustainable Materials and Technologies for Energy and Bio Applications (SMTBEA-2021)" organized by the department of ECE and SSNRC, SSN Institutions in association with the Indian Association for crystal growth, Indian science and technology association and IEEE Comsoc Society Madras Chapter on 21.05.2021.

71. Dr. S. Esther Florence & Dr. S. Ramprabhu, Asso. Prof. was a session chair during the "5th International Conference on Computer, Communication, and Signal Processing (ICCCSP2021)" organized by the Department of IT, SSNCE and technically co-sponsored by IEEE Madras Section on 25.05.2021.

72. Dr. S. Radha, Prof & Head as DC member attended the synopsis meeting of a research scholar at SRM University 25.05.2021.

73. Dr. S. Radha, Prof & Head acted as an external examiner for PG project viva-voce phase-II of M.E Wireless Technologies students at MIT on 27.05.2021.

74. Dr. P. Vijayalakshmi, Prof. has become an annual member of the International Speech Communication Association (ISCA) for the year 2021.

75. Dr. P. Vijayalakshmi, Prof. reviewed a paper submitted to ACM transactions on Asian and low-resource language information processing (TALLIP) and 4 papers submitted to INTERSPEECH 2021, an ISCA flagship conference on speech processing.

RESEARCH CORNER

PROJECT PROPOSALS

➢ Dr. R. Amutha, Prof. as PI, Dr. B. Ramani, Asso. Prof. as Co-PI submitted a proposal titled "Design and Development of Home-based rehabilitation system" to DST-SERB under the scheme POWER for possible funding worth Rs.23.97 Lakh.

➢ Dr. P. Vijayalakshmi, Prof., Dr. T. Nagarajan, Prof. & Head/IT and Dr. M. P. Actlin Jeeva, Asst. Prof./KL University submitted a project proposal titled "Noise-Aware Text-to-Speech Synthesis system for Tamil" to DST-SERB under the scheme POWER on 11.01.2021 for a funding of Rs. 28.51 Lakh.

➢ Dr. S. Radha as Project Coordinator & Dr. R. Kishore as Project Co-Coordinator submitted an AQIS proposal titled "Establishment of IoT Research and Innovation Lab" under the MODROB-Regular Application Scheme for funding worth Rs. 17.46 Lakh.

➢ Dr. S. Kirubaveni Asso. Prof. as PI, Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath Asso. Prof. and Dr. R. Govindarajan Research scientist/RC as Co-PIs submitted a project proposal titled "Development of Metal Oxide Based Self Powered Multi-functional Sensor with Integrated Electronics for Sewage Treatment Plant" to DST-SERB under the scheme POWER for a funding of Rs. 29.93 Lakh.

➢ Dr. M. Gulam Nabi Alsath, Asso. Prof. as PI, Dr. S. Kirubveni, Dr. S. Ramprabhu, Asso. Prof(s), Dr. S. Radha, Prof & Head as Co-PIs submitted a proposal titled "Theoretical and Experimental Investigations on the Design of Novel Plasmonic Microsensor Arrays with Remote Data Acquisition for Biomedical Applications" to DST-SERB under CRG scheme for funding worth Rs.55.63 Lakh.

➢ Dr. C. Annadurai, Asso. Prof. as PI and Dr. I. Nelson, Asso. Prof. as Co-PI submitted a proposal titled "Crop Selection and Productivity Improvement based on Live Climatic Conditions using Satellite Images" to DST-SERB for funding worth Rs.42.92 Lakh.

➢ Dr. R. Kalidoss, Asso. Prof. as PI, Dr. B. Partibane, Dr. K. S. Vishvaksenan, Asso. Prof., Dr. K. Sathishkumar, Asso. Prof./Chemical and Dr. N. Bhalaji, Asso. Prof./IT as Co-PIs submitted a proposal titled "Specific Measurable Assistive Reusable Technology for Diabetic Monitoring" to DST-Biomedical Device and Technology Development (Grand Challenge) for funding worth Rs.20.4 Lakh.

➢ Dr. S. Ramprabhu, Asso. Prof. as PI, Dr. M. Gulam Nabi Alsath, Asso. Prof. and Dr. S. Radha, Prof & Head as Co-PIs submitted a proposal titled "Experimental Investigations on Electromagnetic Radiation Suppression in Mobile Telephony Using Conformal Frequency Selective Surfaces" to DST-SERB under the CRG scheme for funding worth Rs.35.37 Lakh.

➢ Dr. M. Gulam Nabi Alsath, Asso. Prof. as PI, Dr. S. Kirubaveni & Dr. S. Ramprabhu, Asso. Prof(s) as Co-PIs submitted a proposal titled "Experimental Investigations on the Synthesis of Conductive Oxides and the Development of Optically Transparent Antennas for Automotive Applications" to India Italy Call for Mobility of Researches worth Rs. 17.69 Lakh.

➢ N. Prabagarane, Dr. R. Kishore, Asso. Prof(s), Dr. S. Radha, Prof & Head & Dr. N. Edna Elizabeth, Prof. submitted a proposal titled "BRAINternet The Internet of Intelligent Entities" to International Cooperation Division under India Italy Call for Mobility of Researches worth INR 16.50 Lakh.

BOOK CHAPTERS

➢ Dr. R. Kishore, Asso. Prof., Dr. K. Kumar, Faculty/VIT Vellore Campus, "Exploring the possibilities of security and privacy issues in healthcare IoT" in Cognitive Data Science in Sustainable Computing Book Series-Intelligent IoT Systems in Personalized Health Care, Elsevier Academic Press, pp.315-329, Nov. 2020.

➢ Dr. R. Kishore, Asso. Prof., Dr. K. Kumar, Faculty/VIT Vellore Campus, Dr. Yongbin Yu, UESTC/China, "Applications of Machine Learning in Cyber Forensics" in Confluence of AI, Machine, and Deep Learning in Cyber Forensics, IGI Global, pp. 29-46, Dec. 2020.

➢ Dr. D. Aju, Dr. Anil Kumar Kakelli, Dr. Ashwin Suresh Varma, Faculty members/VIT, Dr. R. Kishore, Asso. Prof., "A Comprehensive Perspective on Mobile Forensics: Process, Tools, and Future Trends" in Confluence of AI, Machine, and Deep Learning in Cyber Forensics, IGI Global, pp. 1-28, Dec. 2020.

➢ Dr. R. Hemalatha, Asso. Prof., Dr. S. Radha, Dr. K. Muthumeenakshi, Asso. Prof., "Disease Monitoring of Cucumber in Polyhouse through IoT based Mobile Application", in IGI Global, Artificial Intelligence and IoT-Based Technologies for Sustainable Farming and Smart Agriculture, pp. 273-288, 2021.

INTELLECTUAL PROPERTY RIGHTS

➢ Dr. S. Esther Florence, Asso. Prof., Dr. R Vimal Samsingh, Asso. Prof./Mech & Ms. B. Sakthi Abirami, SRF "Quad Band RF shield using a mechanically configurable Venetian Blind Structure", 202141010951 during March 2021.

➢ Dr. M. Gulam Nabi Alsath, Dr. S. Kirubaveni, Asso. Prof., Ms. P. Devi Sowjanya, RS, Dr. S. Radha, Prof. and Ms. Y. Thusarika (UG-ECE 2016-2020 Batch), "Novel Optically Transparent UWB MIMO Antenna System: A Method and Device thereof", 202141010975 during March 2021.

➢ Dr. P. Vijayalakshmi, Prof., Dr. T. Nagarajan, Prof & Head/IT, Ms. T. A. Mariya Celin, RS, "A Speech-input Speech-output Communication Aid for Speakers with Cerebral Palsy" 201941031287 during February 2021

RESEARCH DATABASE

The Speech corpus "The SSNCE database of Tamil dysarthric speech" developed by Dr. P. Vijayalakshmi, Prof., Ms. T. A. Mariya Celin, RS, Dr. T. Nagarajan, Prof & Head/CSE, SNU Chennai at Speech Lab, SSNCE, is now released by the Linguistic Data Consortium (LDC), University of Pennsylvania, officially, for rehabilitation research. LDC is a globally renowned distributor of linguistic data.

JOURNAL PUBLICATIONS

➢ Annapoorani S and Jayaparvathy R, "Grasshopper optimization algorithm tuned maximum power point tracking for solar photovoltaic systems" Journal of Ambient Intelligence and Humanized Computing, Springer Nature, Oct. 2020.

➢ S. Padmathilagam, RS/CEG, K. Malathi, Faculty/CEG, M. Gulam Nabi Alsath, Asso. Prof., T. Manimegalai, Faculty/CEG, S. Shanmathi, PG Scholar/CEG, S. Shini, PG Scholar/CEG, P. Sandeep Kumar, Faculty/SRM, "Low Profile Pattern Switchable Multi-Band Antenna for On/Off Body Communication," International Journal of RF and Microwave Computer-Aided Engineering, vol. 30 (12), e22448, pp. 1-14, Dec. 2020.

➢ S. Padmathilagam, RS/CEG, K. Malathi, Faculty/CEG, M. Gulam Nabi Alsath, Asso. Prof., T. Manimegalai, Faculty/CEG, S. Shanmathi, PG Scholar/CEG, S. Shini, PG Scholar/CEG, P. Sandeep Kumar, Faculty/SRM, "Low Profile Pattern Switchable Multi-Band Antenna for On/Off Body Communication," International Journal of RF and Microwave Computer-Aided Engineering, vol. 30 (12), e22448, pp. 1-14, Dec. 2020.

➢ K. Malathi, Faculty/CEG, S. Padmathilagam, RS/CEG, M. Gulam Nabi Alsath, Asso. Prof., N. M. Dinesh, Mr. Michael Shaun Morais, Akshara Viswanathan, UG students/CEG, P. Sandeep Kumar, Faculty/SRM, A. K. Shrivastav, Faculty/SEC, "On the design of frequency reconfigurable tri-band miniaturized antenna for WBAN applications" in AEU-International Journal of Electronics and Communications, vol. 127, 153450, Dec. 2020.

➢ S. Shoba, Faculty/VIT, Asutosh Kar, Faculty/IIITDM, R. Rajavel Ramadoss, Asso. Prof., "Performance analysis of various training targets for improving speech quality and intelligibility," Applied Acoustics, vol. 175, Dec. 2020.

➢ Khalifeh A, Darabkh KA, Khasawneh AM, R. Kishore, Asso. Prof., "Wireless Sensor Networks for Smart Cities: Network Design, Implementation and Performance Evaluation," in MDPI Electronics, vol. 10 (2), pp. 1-28, Jan. 2021.

➢ P. Devisowjanya, RS, Yarasi Tusharika (UG 2020), M. Gulam Nabi Alsath, Dr. S. Kirubaveni, Asso. Prof(s)., K. Malathi, Faculty/CEG, Dr. S. Radha, Prof. & Head, Santosh Narendhiran, P. Balaji Bhargav, SSNRC, "A Novel Optically Transparent UWB Antenna for Automotive MIMO Communications," IEEE Transactions on Antennas and Propagation, vol. 69, pp. 1-8, Jan. 2021.

➢ D. Kanchana, RS, S. Radha, Prof. & Head, B. S. Sreeja, Asso. Prof., E. Manikandan, Asst. Prof./BSA-Crescent, "A miniaturized flexible frequency selective surface for dual-band response," International Journal of Microwave and Wireless Technologies, pp. 1-7, Nov. 2020.

➢ M. Kavitha, RS, N. Venkateswaran, Prof., "Multiband Terahertz Metamaterial Absorber Based on Multipolar Plasmonic Resonances," Plasmonics, pp. 1-9, Jan. 2021.

➢ K. Balaji, PT-RS, S. Sakthivel Murugan, Asso. Prof., "Framework for health Management and recording for sailors using the Internet of Things in Underwater Communication," International Journal for Multiscale Computational Engineering, vol. 19 (1), pp. 17-24, Feb. 2021.

➢ Saffrine Kingsly, Faculty/Symbiosis, K. Malathi, Faculty/CEG, M. Gulam Nabi Alsath, Asso. Prof., T. Manimegalai, Faculty/CEG, S. Sangeetha, Faculty/VIT, P. Sandeep Kumar, Faculty/SRM, K. Indumathi, Faculty/SEC, "Bandwidth Reconfigurable Microwave Filter Using Stepped Impedance C-Shaped Resonator," Microwave and Optical Technology Letters, vol. 63, no. 2, 432-436, Feb. 2021.

➢ K. T. Selvan, Prof.,"Lessons Learned From the IEEE AP-S Madras Chapter on Electromagnetics Education inIndia[Education Corner],"IEEE Antennas and Propagation Magazine, vol. 63 (1), pp. 97-102, Feb. 2021.

➢ G. Annalakshmi, RS, S. Sakthivel Murugan, Asso. Prof., "Local Neighborhood Edge Responsive Image Descriptor for Texture Classification Using Gaussian Mutated JAYA Optimization Algorithm," The Arabian Journal of Science and Engineering, pp. 1-20, Feb. 2021.

➢ C. Ashok, PT-RS, N. Venkateswaran, Prof., "Manifold Ambiguity-Free Low Complexity DOA Estimation Method for Unfolded Coprime Arrays," IEEE Communication Letters, pp. 1-5, Feb. 2021.

➢ V. Angeline Beulah, RS, N. Venkateswaran, Prof., "Subspace Leakage Reduced Non-Uniform Sparse Fibonacci-like Planar Array to estimate azimuth and elevation angles of both AoA and AoD," Transactions on Emerging Telecommunications Technologies, Wiley, vol. 32 (2), pp. 1-24, Feb. 2021.

➢ G. Indumathi, PT-RS, V. Vaithianathan, Asso. Prof., "Optimal relay and channel selection schemes for multiconstrained QoS multicast routing in cognitive radio adhoc networks," International Journal of Communication Systems, e4674, pp. 1-12, Feb. 2021.

➢ G. Nithyanandham, RS, K. J. Jegadishkumar, M. Gulam Nabi Alsath, Asso. Prof(s), "Compact coplanar waveguide fed implantable antenna with hybrid split-ring resonators," International Journal of RF and Microwave Computer-Aided Engineering, e22625, pp. 1-11, March 2021.

➢ M. Saravanan, PT-RS, R. Kalidoss, B. Partibane, K. S. Vishvaksenan, Asso. Prof., "Design of an interlocked four-port MIMO antenna for UWB automotive communications," International Journal of Microwave and Wireless Technologies, pp. 1-8, March 2021.

➢ N. Ambika, RS, K. Muthumeenakshi, Asso. Prof., S. Radha, Prof. & Head, "Classification of Primary User Occupancy Using Deep Learning Technique in Cognitive Radio," Advances in Automation, Signal Processing, Instrumentation and Control, Lecture Notes in Electrical Engineering 700, pp. 1795-1804, March 2021.

➢ J. Vikneshwar, (PG-CS), K. Muthumeenakshi, Asso. Prof., S. Radha, Prof. & Head, "Classification of Primary Users Using Deep Residual Learning," Advances in Automation, Signal Processing, Instrumentation, and Control, Lecture Notes in Electrical Engineering 700, pp. 2073-2078, March 2021.

➢ N. Kavitha, RS, M. Gulam Nabi Alsath, S. Kirubaveni, S. Ramprabhu, Asso. Prof(s) K. Malathi, Prof./CEG,"A Novel Ku/K Band Reflectarray Antenna with Reduced Phase Slope and Phase Sensitivity" in the International Journal of RF and Microwave Computer-Aided Engineering, March 2021.

➢ K. Saffrine, Asst. Prof./Symbiosis, K. Malathi, Prof./CEG, M. Gulam Nabi Alsath, Asso. Prof., S. Sangeetha, Ast. Prof./VIT, P. Sandeep Kumar, Asst. Prof./SRM, B. Bhuvaneshwari, Prof./PEC, "Switchable Resonator Based Reconfigurable Bandpass/Bandstop Microstrip Filter," International Journal of Electronics, March 2021.

➢ R. Jansi, RS, R. Amutha, Prof., "Hierarchical evolutionary classification framework for human action recognition using sparse dictionary optimization," Swarm and Evolutionary Computation, vol. 63, pp. 1-11, March 2021.

➢ M. Akila, RS, N. Divya and K. T. Selvan, Prof., "Low-Cost, Wideband Checkerboard Metasurfaces for Monostatic RCS Reduction," IEEE Antennas and Wireless Propagation Letters,vol. 20, pp. 493-497, April 2021.

➢ R. Logeswaran, PT-RS, Dr. S. Sakthivel Murugan, Asso. Prof., "Optimum frequency Selection for localization of underwater AUV using dynamic positioning parameters," Journal of Microsystem Technologies, pp. 1-13, April 2021.

➢ R. Rajmohan, PT-RS, K. S. Vishvaksenan, R. Kalidoss, Asso. Prof., "Compact four-port slot-based MIMO antenna with isolation enhancement" in the International Journal of Electronics, pp. 1-14, April 2021.

➢ S. Sayi Soundariya, FT-RS and S. Ramprabhu, Asso. Prof., "Design and fabrication of miniaturized tri-band frequency selective surface with polarization-independent and angularly stable response" Frequenz, April 2021.

➢ S. Sangeetha, Asst. Prof./VIT, K. Malathi, Prof./CEG, S. Padmathilagam, RS/CEG, M. Gulam Nabi Alsath, Asso. Prof., P. Sandeep Kumar, Asst. Prof./SRM, K. Saffrine, Asst. Prof./Symbiosis, "Performance Enhanced Folded Multiband MIMO Antenna for Mobile Terminals," AEU-International Journal of Electronics and Communications, April 2021.

➢ S. Swathi, RS, S. Sakthivel Murugan, Asso. Prof., "Design of Filamentary planar spiral coils with enhanced channel model for magnetic induction based underground communication," Transactions on Emerging Telecommunications Technologies, pp. 1-25, May 2021.

➢ S. Swathi, RS, S. Sakthivel Murugan, Asso. Prof., "PCB planar and filamentary planar spiral coils based underground Magnetic induction communication with enhanced channel model," Wireless Personal Communications, pp. 1-26, May 2021.

➢ N. Venkateswaran, Prof., W. Jino Hans, Asso. Prof. & N. Padmapriya, Asso. Prof./Maths, "Deep learning based robust forward-collision warning system with range prediction" in Multimedia Tools and Applications, vol. 80, pp. 20849-20867, May 2021. (Clarivate Analytics, IF: 1.51)

➢ Ajay Nair, R. Hemalatha, Asso. Prof., P. Sangeetha, K. Harish Kumar, P. Dinesh Kumar, Inakota Sai Sahith & S. Radha, Prof. & Head, "Efficient crack detection and quantification in concrete structures using IoT," Australian Journal of Electrical and Electronics Engineering, vol. 18 (1), pp. 43-57, May 2021.

➢ S. Markkandan, Asst. Prof./SRM TRP, R. Logeshwaran, Asst. Prof./AIHT, N. Venkateswaran, Prof., "Analysis of Precoder Decomposition Algorithms for MIMO System Design," IETE Journal of Research, pp. 1-8, May 2021.

CONFERENCE PRESENTATIONS

1. A. Gowtham, L. Anirudh, S. Adittya, B. A. Aakash, UG 2017-2021, B. S. Sreeja, Asso. Prof., "Detection of Arrhythmia using ECG waves with Deep Convolutional Neural Networks," in the IEEE 4th International Conference on Electronics, Communication and Aerospace Technology ICECA 2020 organized by RVS Technical Campus on Nov. 5, 2020.

2. Anirudh Vijay, Arjun Krishnan, M. Balaji, UG 2017-2021, B. S. Sreeja, Asso. Prof., "Gesture Recognizer and Communicator using Flex Sensors and Accelerometers with Logistic Regression" in the 3rd International Conference on Intelligent Sustainable Systems (ICISS) held at Palladam during Dec. 3-5, 2020.

3. C. Joshitha, D. Sai Priyanka, D. Raga Vyshnavi, P Nagarjuna, B. S. Sreeja, Asso. Prof., "Electrothermal Micro Tweezer for Biomedical Applications" in International Conference on Recent Innovations in Engineering and Technology (ICRIET 2020) held at Nandha Engineering College, Erode during Dec. 4-5, 2020.

4. Aparajith Srinivasan, N. Nithya, K. Raj Vignesh, E. Ramya, S. Abirami, M. Sabharish Padmanaaban, UG 2017 - 2021, B. S. Sreeja, Asso. Prof., S. Radha, Prof & Head, "Elder Care System using IoT and Machine Learning in AWS Cloud" in IEEE 17th International Conference on Smart Communities: Improving Quality of Life using ICT, IoT and AI (HONET-2020) held at University of North Carolina, Charlotte, USA during Dec. 14-16, 2020.

5. R. Kishore, Asso. Prof., "IoT Based Intelligent Control System for Smart Building," in the 2020 International Conference on Innovation and Intelligence for Informatics, Computing and Technologies (3ICT2020), held at Bahrain during Dec. 21, 2020.

6. S. Mary Cecilia, RS, S. Sakthivel Murugan, Asso. Prof., "Edge Aware Turbidity Restoration of Single Shallow Coastal Water Image'' in the International Conference on Innovation Technology for sustainable Development - ICITSD 2021 organized by VIT Chennai Campus and Center for Cyber Physical System during Jan. 27-29, 2021. The paper received "BEST PAPER AWARD".

7. M. Vimal Raj, RS & S. Sakthivel Murugan, Asso. Prof., "Motion deblurring analysis for underwater image restoration," International Conference on Innovation Technology for sustainable Development - ICITSD 2021 organized by VIT Chennai Campus and Center for Cyber Physical System during Jan. 27-29, 2021.

8. Tejaswini, Sai Deepika I, S. Sakthivel Murugan, Asso. Prof., "Development of a Navigation and Position Tracking System for a Remotely Operated Vehicle (ROV) – ORCA," International Conference on Innovation Technology for sustainable Development - ICITSD 2021 organized by VIT Chennai Campus and Center for Cyber Physical System during Jan. 27-29, 2021.

9. Gundepudi V. Surya Sashank, UG-Mech 2018-2022, Charu Jain, UG 2018-2022, N. Venkateswaran, Prof., "Detection of Acute Lymphoblastic Leukemia by Utilizing Deep Transfer Learning," at the International Conference on Machine Vision & Augmented Intelligence (MAI-2021) held during Feb. 11-14, 2021.

10. S. Surya Prakash, S. Surendran, UG-Chemical 2017-2021, D. P. Shravanee, M. P. Shwetha, Aparajith Srinivasan, UG-ECE 2017-2021, W Jino Hans, Asso. Prof., "A Novel Engine Oil Health Classification Using Physical Properties and DWKNN Algorithm," in the 2021 International Conference on Computer Communication and Informatics organized by Sri Shakthi Institute of Engineering & Technology during Jan. 27-29, 2021.

11. Saravanan P, Anbuselvi M, "PSO-GRNN based optimal design of switched reluctance motor for electric vehicle", presented in ICEES-2021, International conference at Dept. of EEE, SSNCE, conducted during 11-13 Feb. 2021.

12. Saravanan P, Anbuselvi M, "Design of an adaptive fuzzy logic speed controller for SRM drive", presented in ICEES-2021, International conference at Dept. of EEE, SSNCE, conducted during 11-13 Feb. 2021.

13. C. Vinoth Kumar, S. Joseph Gladwin Asso. Prof(s)., "Read Textual features in Images and convert to Editable form by extended use of Artificial Neural Networks, Deep learning and Maximally Stable Extremal Region techniques", International Conference on Advances in Smart Sensor, Signal Processing and Communication Technology (ICASSCT 2021) organized by the Department of Electronics, Goa University, Goa during March 19-20, 2021.

14. Aakash Murugan & Mr. V. Vignesh, UG-ECE 2018-2022, B. Ramani, Asso. Prof. "Deep Reinforcement Learning based Autonomous System for Dynamic Traffic Management," National Virtual Conference on Automation, Robotics, Artificial Intelligence and Mechatronics (ARAM) 2021 on 19.03.2021 and received the "Best Paper Award".

15. B. Naga Lakshmi, D. Shanmugapriya, V. Nandhiniraj, UG-ECE 2016-2020, S. Vishnupriya, UG-ECE 2018-2022, Dr. G. Durga, Asso. Prof., "Handheld Device for Women Safety" National Virtual Conference on Automation, Robotics, Artificial Intelligence and Mechatronics (ARAM 2021) on 19.03.2021 and received the "Best Paper Award" in the category of Technology for Woman - Special Call.

16. C. Annadurai, I. Nelson, E. Ramya, R. Shivani, V. Mathusathana, students of UG-ECE 2017-2021, "IoT Based Smart Energy Meter System using Machine Learning" 4th International Conference on Intelligent Computing (IConIC 2K21) organized by Panimalar Engineering College, Chennai on 26.03.2021.

17. C. Annadurai, I. Nelson, X. N. Ranald Nivethen, M. Senthil Kumar, Suraj Vinod, students of UG-ECE 2017-2021, "Implementation of IoT in Workplace Monitoring and Safety Systems," 4th International Conference on Intelligent Computing (IConIC 2K21) organized by Panimalar Engineering College, Chennai on 26.03.2021.

18. I. Nelson, C. Annadurai, Shriraam Venkatasubramani, I. Yogesh, S. Shrinivas Badri, students of UG-ECE 2017-2021, “Underwater Image Enhancement and Fish Detection” in the 4th International Conference on Intelligent Computing (IConIC 2K21) organized by Panimalar Engineering College, Chennai on 27.03.2021.

19. R. Amutha, Prof., “Machine Learning-based Human Activity Recognition using Neighbourhood Component Analysis” in the International Conference ICCMC’21 organized by Surya Engineering College on 08.04.2021.

20. Charu Jain, UG-ECE 2018-2022, Gundepudi V Surya Sashank, UG-Mech 2018-2022 Batch, N. Venkateswaran, Prof., S. Markkandan, Asst. Prof./AIHT, “Low-cost BLE based Indoor Localization using RSSI Fingerprinting and Machine Learning Localization” in Proc. of IEEE WiSPNET 2021 organized by SSNCE held during March 25-27, 2021, pp. 363-367.

21. Anirudh Srikanth, Aparajith Srinivasan, Haresh Indrajit, UG-ECE 2017-2021, N. Venkateswaran, Prof., “Contactless Object Identification Algorithm for the Visually Impaired using EfficientDet” in Proc. of IEEE WiSPNET 2021 organized by SSNCE held during March 25-27, 2021, pp. 417-420.

22. R. Madura Meenakshi, N. Padmapriya, Asso. Prof./Maths, N. Venkateswaran, Prof., R. Ravikumar, Tagore MCH, Ramya Chelliah, Tagore MCH, “Localization of Eye Region in Infrared Thermal Images using Deep Neural Network” in Proc. of IEEE WiSPNET 2021 organized by SSNCE held during March 25-27, 2021, pp. 446-450.

23. S. Sneha, Shweta Srikanth, B. Vibish Kashyap, UG-ECE 2018-2022, Vishnu K. Krishnan UG-CSE 2018-2022, R. Hemalatha Asso. Prof. & S. Radha, Prof. & Head, “IoT Based Remote ECG Monitoring System” in the ACM/CSI/IEEECS Research & Industry Symposium held at AIC-IIIT Kottayam on 03.05.2021.

24. Evangelin Glory, PG-AE 2019-2021, P. Vijayalakshmi, Prof., G. Satheesh Kumar, Asso. Prof./ Mechanical, “Development of a speech and gesture-enabled wheelchair system for people with cerebral palsy,” in Proc. of IEEE International Conference on Signal Processing and Communication organized by Karunya Institute of Technology & Sciences, Coimbatore held during May 13-14, 2021, pp. 620-624.

25. Evangelin Glory N, PG-AE 2019-2021, G. Satheesh kumar Asso. Prof / Mechanical, P. Vijayalakshmi, Prof., “Speech and gesture enabled wheelchair system for people with cerebral palsy”, in Proc. of National Virtual Conference on Automation, Robotics, Artificial Intelligence and Mechatronics (ARAM) 2021 held on 19.03.2021, at SSNCE.

CONSULTANCY

1. Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Dr. S. Ramprabhu and Dr. S. Esther Florence generated a revenue of Rs. 15930/- by executing RF measurements consultancy to the research scholars Ms. R. Kokila Priya & Mr. Saminathan from SRM IST during Dec. 2020. Mr. S. Murugan assisted the same.

2. Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Dr. S. Ramprabhu and Dr. S. Esther Florence generated a revenue of Rs. 10030/- by executing RF measurements consultancy to the research scholar Mr. E. Aravindraj from Pondicherry Engineering College during Jan. 2021. Mr. S. Murugan assisted the same.

3. Dr. S. Radha, Prof. & Head, Dr. M. Gulam Nabi Alsath, Dr. S. Ramprabhu and Dr. S. Esther Florence generated a revenue of Rs. 5900/- by executing RF measurements consultancy to the research scholar Mr. D. Dileepan from SRM IST during Feb. 2021. Mr. S. Murugan assisted the same.

4. Dr. S. Radha, Prof., Dr. M. Gulam Nabi Alsath, Dr. S. Ramprabhu and Dr. S. Esther Florence, Asso. Prof(s). generated a revenue of Rs. 56050/- through Antenna and Microwave measurements. Mr. S. Murugan assisted the same.

5. Dr. R. Rajavel, Asso. Prof. got a Consultancy Project Sanctioned worth Rs. 2 Lakh from Preethi Kitchen Appliances for three months starting March 2021.

6. Dr. P. Vijayalakshmi, as a research consultant to 4S medical research Pvt. Ltd., New Delhi, received Rs. 1,77,000/- towards developing a scoring system for deaf and mute learners. This consultancy work is to be carried out for 6 months starting from April 2021.

CLUB REPORTS

The months of January to May were rather eventful, with respect to the clubs in our department. Amidst this pandemic situation, the IEEE ComSoc and the Tech Club and the AECE managed to conduct a flurry of amazing online events during our intra-college tech fest, the Invente, in which students from various departments across colleges participated enthusiastically to showcase their talents in all the competitive events conducted.

THE TECH CLUB

HACKINFINITY

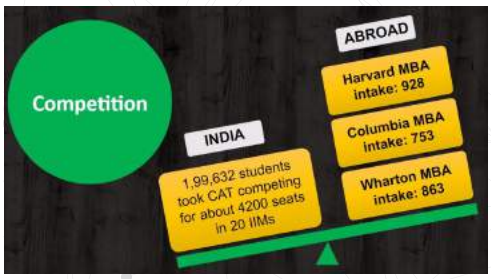
Tech club organized a flagship event for Invente 5.0, HackInfinity – a 24-hour online hackathon powered by Jamboree Education and Mr. Cooper, that was conducted via Google Meet and Discord. The participants were encouraged to use the latest technologies to build some innovative products in any of the following domains.

- Data Security
- Medical and Healthcare
- Software Development
- Robotics and Student Innovation

This event was organized for two days, the 22nd and 23rd of January, 2021. 9 teams, with each team comprising 2-4 students from various colleges were shortlisted to participate in the hackathon.
Jamboree Education sponsored the event with Rs. 20,000. Mr. Cooper humbly agreed to judge the event with a panel of 11 judges. They also provided internship opportunities for worthy participants.

Webinar on "How to study masters abroad with minimal investment and scholarships"

The webinar conducted by the Jamboree Education Pvt ltd on 9th March 2021, about "How to study masters abroad with minimal investment and scholarships", was eye opening. It gave the participants a deep insight into the plausibility of pursuing masters in some of the well known foreign countries and the potential pitfalls that could occur. A detailed explanation was given on proper budgeting, availing scholarships and loans. The talk really enlightened the masters aspirants on the practical aspects of ROI predictions and the kinds of obstacles they could possibly face. The speaker made the participants believe that pursuing masters abroad is not something Herculean and is also not a bed of roses. Altogether, the webinar was a perfect mix of motivation and pragmatism, that was highly appreciated by all the students who attended it.



CORONA 6.0

Tech Club of ECE organized the sixth edition of CORONA, an annual Intra-collegiate technical festival in association with the AECE on 27th March, 2021. A total of 5 events were conducted with 3 technical and 2 non-technical events.

The list of events includes,

1.KRYPTOS 2.0
2.SOLDER IT
3.ONE MINUTE PLEASE
4.DISPRO
5.RISC IT

KRYPTOS 2.0

The event was hosted on an android application created by Tech Club. It had 4 levels. Each level involved testing different aspects of student's ability to think logically. The levels were engineered, specifically, to test the logical ability, critical thinking, information analysis and problem-solving capability. Top 3 teams were given Merit certificates and Cash prize.

Winners:

1st: Palaniappan Senthilnathan,
vJayasurya A

2nd: S. Nikhil Viswanath,
Deekshitha S

3rd: Anusha Chandrasekaran,
Aarthi. V. S

SOLDER IT

This event had two levels. The prelims consisted of 20 questions based on basic electronics and semiconductor physics. The finals comprised of 2 questions which were application based and the participants were expected to sketch the circuit. They were assessed on accuracy and feasibility of the answer to the given problem statement. Top 2 were given Merit certificates and Cash prize.

Winner:

Medicherla S,
S Srirama Charan,
S Ragul

Runner up:

Akilandeshwari,
Aakash Murugan

ONE MINUTE PLEASE:

This event consisted of four rounds. It was a fun filled event where the participants were given technical words and were allowed to give three clues to their teammate, who had to find it in under a minute.

Winner:
Sai Kavya Neharika M C
Aishwarya Ponni P

Runner-Up:
Rashmika B
Shruthi C K

DISPRO:

Inspired from shipwreck and Block&Tackle, this event made participants think outside the box and present their ideas on the given theme. The participants were expected to block their product based on the questions asked by the judges and tackle their way through to get the green signal.

Winner:
Aakash Murugan
Akilandeshwari R

Runner-up:
K Ajay Adithya
K Bhavya

RISC IT:

The event tested the skills regarding building basic circuits using an Arduino and code the Arduino to simulate a given task. The event took place on tinkercad platform. The participants were assessed on the logic behind the code and time taken to solve the task.

The event was a grand success and a prize money of Rs. 8,000 were distributed to the winners.

Winners:
Aishwarya Ponni P,
Indu S

Runner up:
Rashmika B,
C K Shruthi

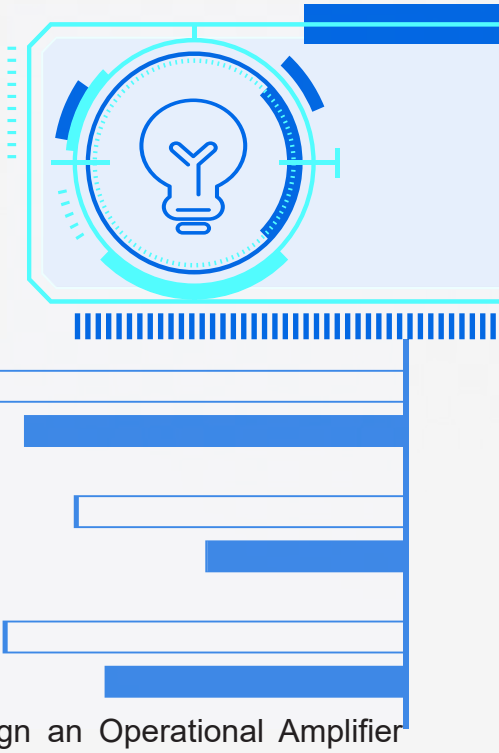
ZENITH

Zenith is an on-going student friendly program aimed at developing and narrowing down the skills of a student in a particular discipline. We provide them with the opportunity to develop their interest and improve their technical prowess in their chosen domain. Students are continuously mentored by the members of the Tech Club. This event was catered specifically to II & III year students.

Main motive of Zenith was to encourage Students to gain knowledge and experience by taking up any project and arriving at it by working from their basics. This includes regular assignments and weekly meetings with their respective domain heads. Students were also expected to meet their deadlines which allows them to be accountable for their work.

Zenith also helps any individual to improve their professional skills, draft an excellent Curriculum Vitae and a valuable asset for anyone who is interested in pursuing their Masters abroad.

Domains offered :



- Analog Integrated Circuit Design
- Application Development
- Machine Learning
- Robotics

Domain Heads :

Analog Integrated Circuit Design	**Sampath Kumar U**
Application Development	**Rokesh Kumar P**
Machine Learning	**Aparajith Srinivasan**
Robotics	**Niranjan Kumar I**

Domain - Analog Integrated Circuit Design :

Under Analog IC Design, students would learn how to design an Operational Amplifier by the end of the program. This involves a regular assignment and a weekly schedule to cover relevant topics and the basics that would aid the students to design Op-Amp from scratch. Students also would gain hands-on experience working with LtSpice. This domain also provides excellent opportunities for the students to pursue their Masters as the research works are abundant.

Domain - Application Development :

In this course, students would learn to develop cross platform mobile apps and Learn Flutter Framework and Dart from ground level step-by-step. Along the course, students developed a few apps that covered the various fundamentals of *Flutter widgets* and layout.

Students were given a chance to regularly share their ideas and form groups to develop it into an application. They also learned to integrate firebase as a backend for mobile apps. Finally, they were taught how to publish mobile apps in Google Play Store.

Domain - Machine Learning :

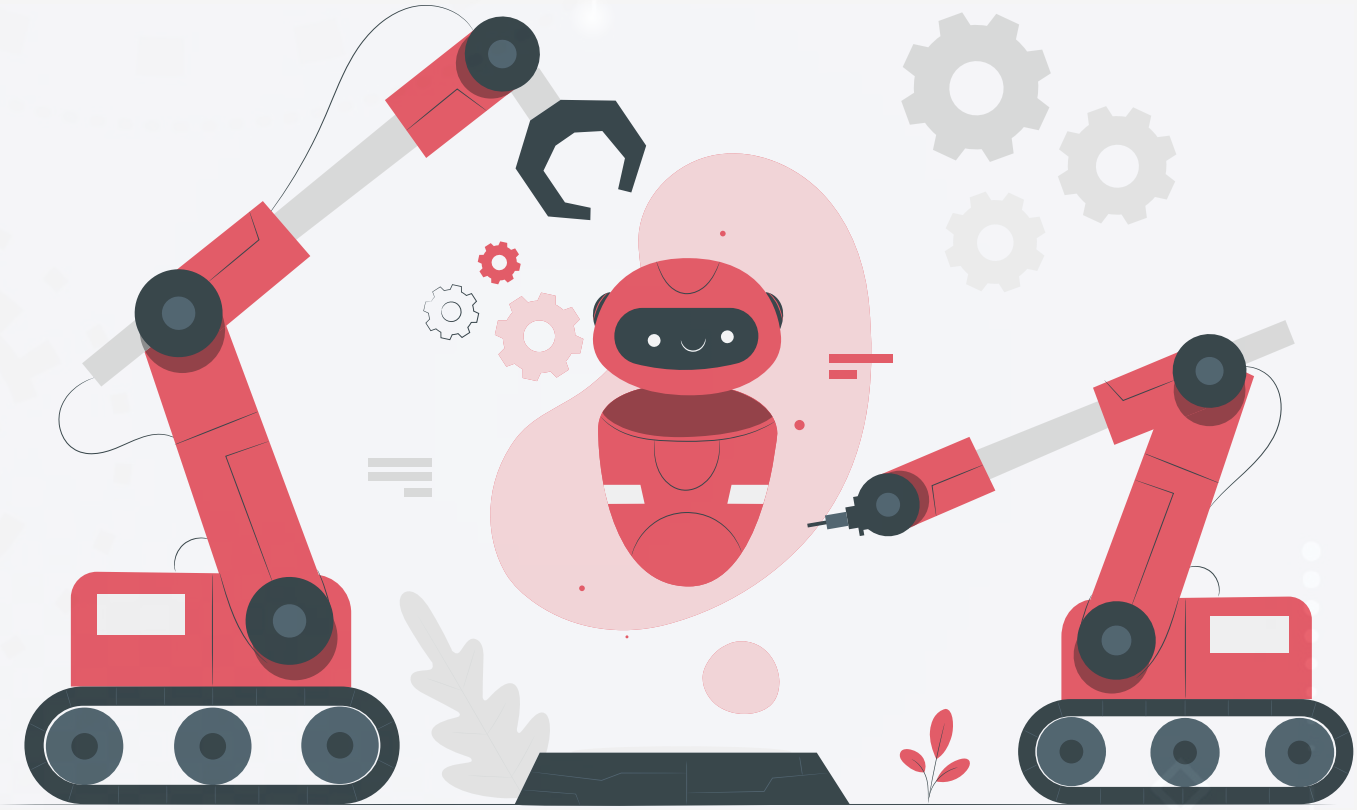
In the currently evolving field of Machine Learning, students will get to know about the fundamentals behind various algorithms and models in Machine learning and Deep Learning. To bolster their theoretical knowledge, practical hands-on sessions with frameworks like *scikit-learn* and *TensorFlow* were offered and tips to improve performance was explained.

After gaining sufficient knowledge, students were separated into teams and were encouraged to work on a real-world problem and develop a solution for it. Interested students will be encouraged to present their research findings in professional platforms such as conferences, workshops, etc., and will be guided in the same.

Domain - Robotics :

This course helped students to taste various aspects of robotics including simulations, coding and much more. The students were primarily working on simulating a robot which would be able to move around in an environment filled with obstacles. Unlike conventional simple hard-coding, they were taught to control the robot using advanced control strategies.

Assignments were given, which consist of robot programming to achieve specific goals each week. In the end, a complete system of a *Obstacle Avoidance robot* can be built by the student themselves.



THE IEEE COMSOC

During Invente, the IEEE ComSoc conducted 3 events - Paper presentation, Junkyard Jumble and Data Utopia.

PAPER PRESENTATION

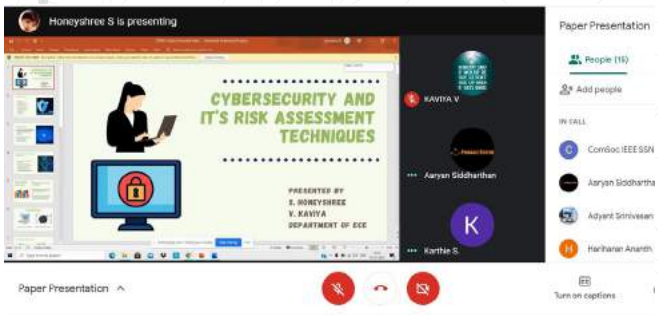
The paper presentation event was conducted on the Google Meet platform on 23rd January, 2021. 14 teams with 29 members in total, participated in the event which was sponsored by the Pinnacle Systems.
This event was conducted in 2 rounds as below:

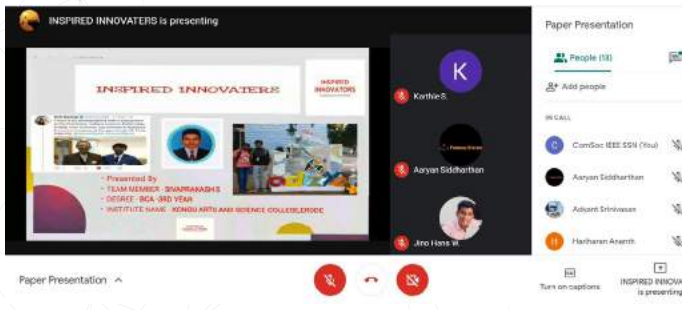
Round 1: Submission of abstract
The abstract of the paper from any of the following domains was asked to send through mail by 17th January, 2021.

- Antenna Systems and its Applications
- Augmented Reality
- Cognitive Science
- Cybersecurity and its risk assessment techniques
- Deep Learning
- Emerging trends in Photonics
- Internet of Intelligent Things
- Internet of Things
- Machine Learning
- Machine Learning/ AI for networks
- MEMS
- Network Security and Blockchain Technology
- Optical Communication and Networks
- Robotics
- Signal and Image processing
- Virtual Reality

10 out of 14 teams were selected for the second round based on the submitted abstracts.

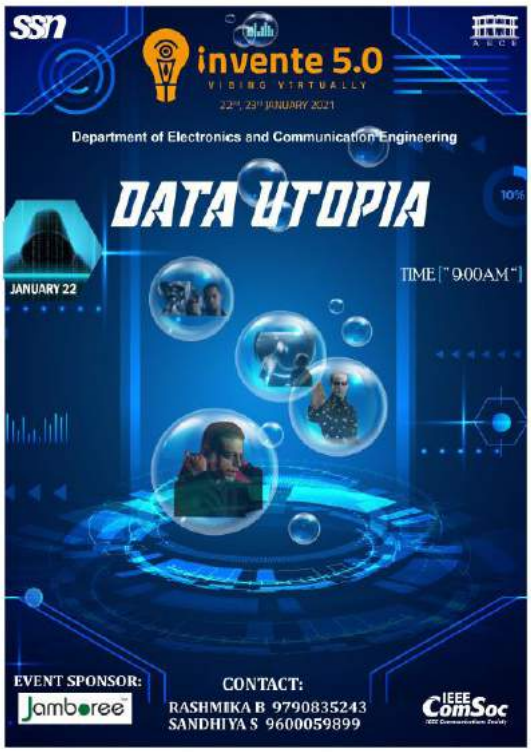
Round 2: Paper presentation
The shortlisted teams from Round 1 had to give a live presentation. The teams were given 5 – 10 minutes to explain their paper and present their idea to the panel of judges. 2 teams were declared as the “Best student presentation” by the judges.





DATA UTOPIA

Data Utopia was a technical event conducted in two rounds which aimed to test the data analytics and machine learning skills of the participants. This event was conducted on 22nd January, 2021 via Google Meet, and was sponsored by Jamboree Education Pvt ltd. 12 teams with 20 members in total, participated in the event. This event also comprised 2 rounds.



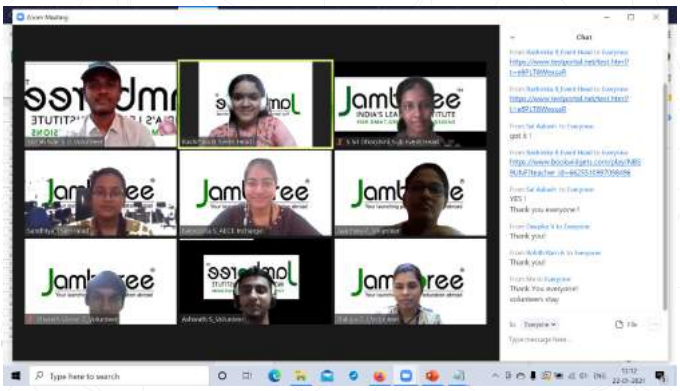
Round 1: (Duration: 20 minutes)

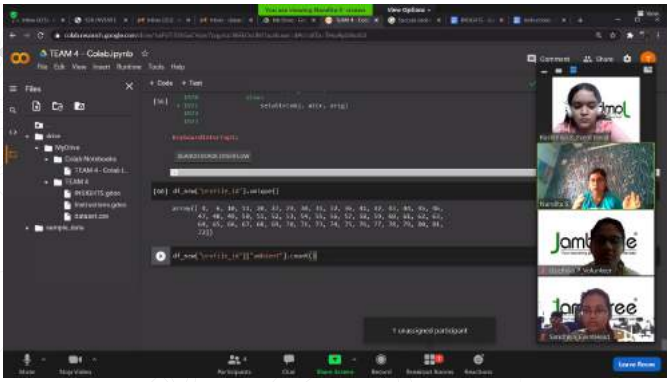
This round tested the analytical, statistical and data interpretation skills of the participants, wherein the participants had to attempt a quiz in an online portal. Each team was put in a breakout room along with a volunteer to monitor them. After the rapid-fire round, based on the performance, the top five teams were selected for the second round.

Round 2: (Duration: 1.5 hours)

This round tested the knowledge of exploratory data analysis (coding) and deriving insights from it. There were 2 stages in this round. In the first stage, the participants were asked to solve a set of puzzles. Each puzzle had the answer to the relationship between the parameters of the dataset. After solving them, in the second stage, each team was given a drive link which had the dataset and they were able to access the coding platform, only for the remaining duration. The teams had to rigorously explore and understand the data to derive best insights from the given dataset. After 1.5 hours, the access to the platform was withdrawn and the coded notebooks of the teams were collected and scrutinized. Two teams with the best code and insights were declared as the winners.

The above were the events conducted by the clubs of our department in this short span of barely more than a month, which paved a way for the students to expand their horizons and explore various fields.





JUNKYARD JUMBLE

Junkyard Jumble was one of the technical events that happened on 23rd January, 2021, via Google Meet. This event was sponsored by Jamboree Education Pvt ltd. 18 teams comprising 41 members in total showed their interest to participate in the event.

The participants had to clear 2 rounds to emerge as the winner of this event.

Round 1: (Duration: 25 minutes)

The first round involved puzzles, scrambled words and references from sci-fi movies. The teams had to solve them to crack the hidden fundamental physics concepts. This round required good presence of mind, analytical and mental ability. Basic concepts of physics (class 11 and 12) were tested. Completeness of each answer mattered to score high points in round 1. Five teams were selected for the next round.

Round 2: (Duration: 3 minutes per team)

This was a Dumb Charades round. Participants had to act out some basic technical questions related to physics to their teammates. The team which guessed and answered the maximum number of questions correctly, won the competition.

DRAWCEPTION

Drawception was an event with a twist that involved Pictionary with a technical flavour. It was organised as two rounds. This event was conducted on 26nd March, 2021 via Google Meet, Jam board and TestPortal. 26 teams with 67 members in total, participated in the event enthusiastically. An amount of ₹750 was used to fund the prizes for winners.

Round 1: (Duration: 15 minutes)
The first round involved pictures that were given as hints to crack the words. This round required quick thinking skills and mental ability. Basic technical words were tested in this round. Completeness of each answer mattered to score high points in round 1. Five teams were selected for the final round based on the score obtained.

Round 2: (Duration: 5 minutes per team)
This was the technical Pictionary round. One participant had to draw the basic technical words to their teammates. The team which guessed the maximum number of words correctly won the competition.

IEEE Membership Drive

The IEEE Communications Society Student branch organized a Membership Drive for the students of SSN College of Engineering on 29th May, 2021. The aim of this drive was to encourage them to make use of IEEE Membership and its resources.

There was a total of 35 students who were interested in the IEEE Membership and wanted to know the benefits for the same. At the end of the webinar, the IEEE ComSoc heads answered the questions posed by the participants. 15 students got the IEEE Student membership and IEEE ComSoc membership.

IEEE ComSoc
IEEE Communications Society

AECE

Despite a confusing year due to the pandemic, 16 students volunteered to add their bit of creativity and dazzle to bring interesting, informative and memorable events to the screen and bridge the gap between the “new normal” and the “original normal” and discharge their duties as members of AECE.

AECE flagged off its activities on 11 September, 2020 with their virtual induction.

The first event was named ***CineCypher*** and saw a participation of 20 teams.

1. The first round – “A Quiz Odyssey’’, was conducted on 18 September, 2020.
2. 4 teams were selected on the basis of their scores for the next round – “Decipher or Die”, which was conducted on 20 September 2020.
3. 2 teams qualified for the last round – “The Fastest Gun in The South’’ and winners were declared. AECE partnered with Madly Madras for prizes.

On 3 October, 2020, AECE, along with Tech Club SSN, in association with Jamboree Education, organised a webinar on the topic “Career Options After Graduation”. Over 200 students registered for the webinar and found it useful. Seeing the great response, Jamboree Education offered a free and live GRE Demo class for students on 12 October 2020. On 18 October 2020, a webinar was conducted by Jamboree Education to introduvce students to Verbal Reasoning in GRE.

On 14 November 2020, AECE announced their theme for Invente – Fandom. On 14 December 2020, AECE along with IEEE Comsoc and Tech Club SSN revealed the 11 events of the Department of Electronics and Communication Engineering, for Invente 5.0, which was conducted on 22 January 2021 and 23 January 2021. Following is a brief description of the events.

Data Utopia

This technical event of IEEE ComSoc in association with AECE was sponsored by Jamboree Education. The event had a footfall of 16 participants.

Enigma

This technical event was sponsored by Pinnacle System and was open to all departments. The event saw participation from 21 students.

E-Treasure Hunt

The event was a technical event and was conducted on 22 January 2021. The event was sponsored by Oasys Cybernetics and was open to ECE, EEE and BME students. It saw a footfall of 39 participants.

IPL Auction

This was a non-technical event sponsored by Oasys Cybernetivcs which had a total of 55 participants on the day of the event.

Junkyard Jumble

This technical event of IEEE ComSoc in association with AECE had a footfall of 41 participants and was sponsored by Jamboree Education.

Make-a-thon

The technical event was held on 22 January 2021. It had 9 participating students and internship offers from Saama AI.

Think D

This technical event which had 23 participants was held on 23 January 2021. The event was sponsored by Oasys Cybernetics.

Entertainment Quiz

This technical event of IEEE ComSoc in association with AECE had a footfall of 41 participants and was sponsored by Jamboree Education.

HackInfinity

This technical event was a hackathon conducted by Tech Club SSN in association with AECE on 22 January 2021 and concluded on 23 January 2021. The event was sponsored by Jamboree Education and the event saw 28 participants.

Paper Presentation

This technical event of IEEE Comsoc in association with AECE, sponsored by Pinnacle System was held on 23 January 2021. The event had 13 paper submissions.

Pitch It Please

This technical event was open to all departments and had 18 participants. The event was sponsored by Oasys Cybernetics and was held on 22 January 2021.

On 9 March 2021, Jamboree Education conducted a webinar regarding the financial aspect of doing Masters abroad.

On 19 March 2021, AECE and Tech Club SSN unveiled a promotion for the 6th edition of one of the department's flagship events – ***Corona***. Corona 6.0 was conducted on 27 March 2021 and a total of five events were conducted for students across all departments.
Two out of the five events were conducted by AECE and the events with a short description in no particular order are as follows:

One Minute Please

The event had a participation of 10 teams with two participants in each team.

Dispro

The event had a footfall of 5 teams with two participants in each team

On 23 May 2021, AECE along with the Institution's Innovation Council conducted an event named Innoventia. The jury examined the abstracts of problem statements submitted by the 12 participating teams / 27 participants. Seven teams qualified for the finals and winners were declared.

And with it, AECE concluded its activities for the academic year 2020-2021.

ANNA UNIVERSITY RANK HOLDERS

Anna University released the Rank List for the Class of 2020. SSN Institutions **bagged 48 University ranks** and the Department of ECE bagged **05 University ranks** at the UG level. The Faculty team congratulates the rank holders and young graduates!

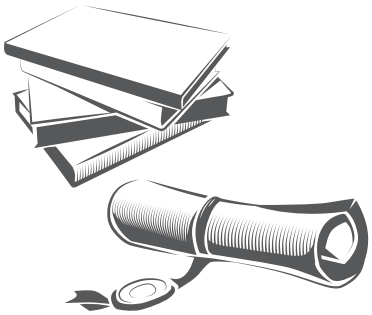
Aarthi V
CGPA: 9.16
Rank: 10

Dinesh Kumar C N
CGPA: 9.15
Rank: 11

Akruthi S
CGPA: 9.12
Rank: 14

Raviteja V
CGPA: 9.03
Rank: 22

Nandhini K
CGPA: 9.02
Rank: 23



PLACEMENT REPORT

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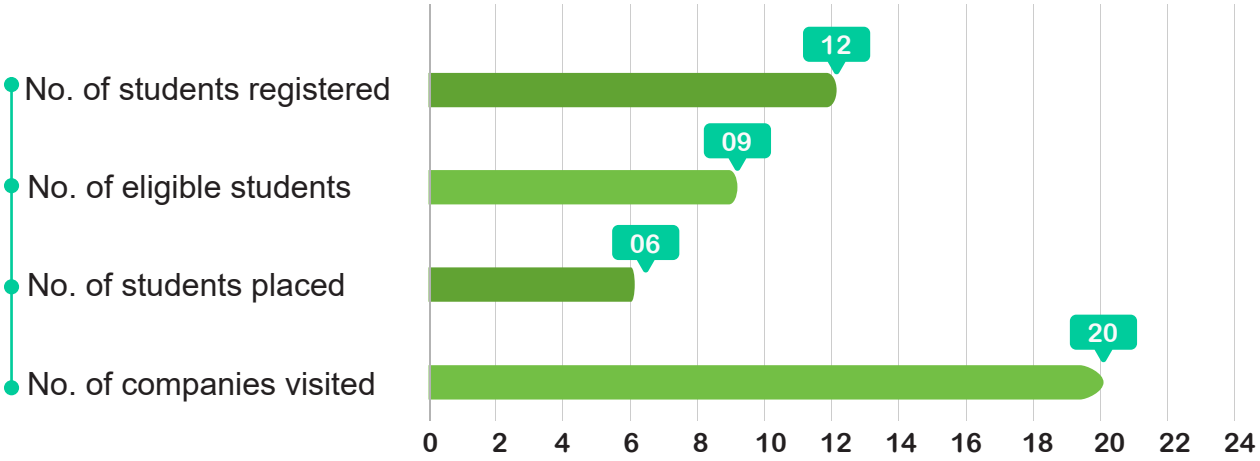

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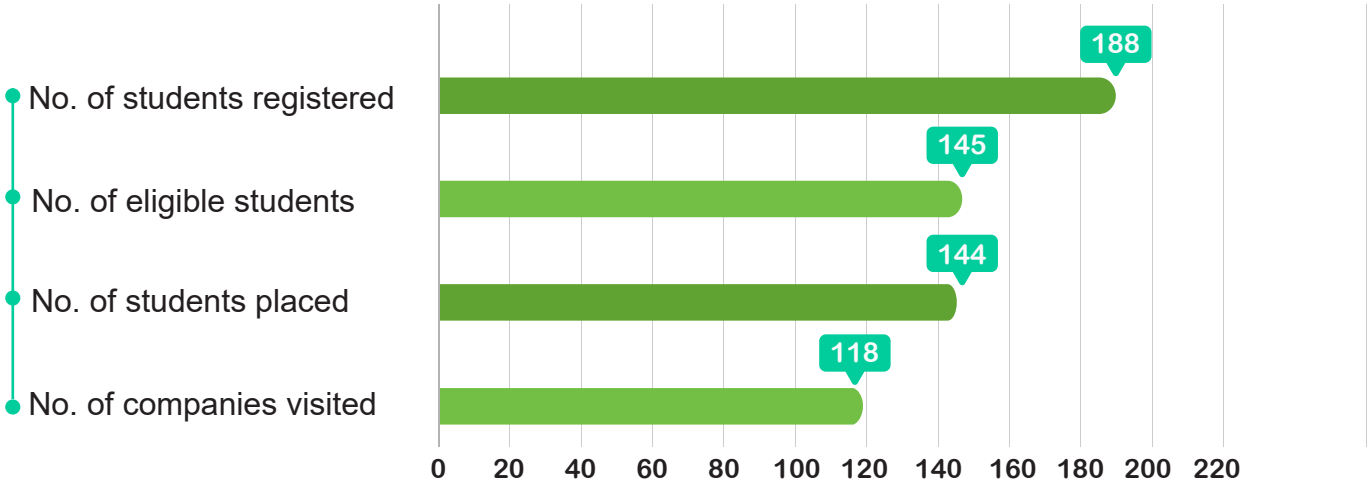


STUDENTS PLACED IN SUPER DREAM AND DREAM COMPANIES

CITI BANK
CTC - 13.70 lakhs

- Aravindakshan S
- Induja U S
- Divya Seshadri M
- Pavithra.D
- Priyadharshni S
- Kirthana R
- Sriharini R
- Vinitha S

Accolite Digital
CTC - 10 lakhs

- Raj Vignesh K

Amadeus
CTC - 10 lakhs

- Karthik G

Accenture
CTC - 9 lakhs

- Padmapriya B

ThoughtWorks
CTC - 8.30 lakhs

- Mohamed Idris A
- Sanofer Sameera S

LTI
CTC - 8 lakhs

- Poojah

STUDENT CO-CURRICULAR ACTIVITIES

1. The team of Mr. S. Abishek, Ms. N. Divya, Mr. K. Harihar, UG-ECE 2017-2021 students under the student mentorship of Ms. M. Akila, RS & Dr. V. Lingasamy and faculty mentorship of Dr. K. T. Selvan, Prof. entered into the SWANtenna20 challenge as one of the five shortlisted teams. The team made a presentation in front of the jury panel on 15.12.2020.
2. The team comprising of Ms. Tejaswini Panati, Ms. I. Saideepika, UG-ECE 2017-2021 Batch, Mr. Guru Prasad & Mr. Hashmath, UG-EEE students, Mr. Vishal & Mr. Vignesh, UG-Mech students mentored by Dr. S. Sakthivel Murugan, Asso. Prof. participated in the SIH Finals -Hardware Edition held in virtual mode during Dec. 21-24, 2020.
3. A project proposal submitted by the student team comprising Mr. R. Adithya, Mr. E. Gunamukhil, Mr. Mopidevi Jayan Sai Venkatesh, UG-ECE 2017-2021 Batch under the mentorship of Dr. K. Muthumeenakshi, Asso. Prof. to the 4th AICTE-Chhatra Vishwakarma Awards 2020 has been shortlisted for National Convention. The presentation was made to the expert committee for online evaluation on 14.05.2021.
4. Ms. S. Shwetha, UG-ECE 2018-2022 Batch have been selected for the Micron Global Women's Mentorship Program. The program will run from April-May 2021. Through a series of weekly mentorship sessions, she will have the opportunity to interact with Micron Women Leaders, learn more about the professional world and acquire new skills.
5. Nethraa Sivakumar of UG-ECE has started her summer research internship in Adobe systems.

WORKSHOP AND TRAINING

1. Ms. J. Abanah Shirley, RS and Ms. N. Kavitha, RS attended the STTP on "Developments in Smart Systems Using Nanomaterials" organized by the Department of ECE, Sri Sivasubramaniya Nadar College of Engineering, Chennai during Dec. 17-18, 2020.
2. Ms. N. Kavitha, RS attended the workshop titled "Different Computational Electromagnetic Techniques and Their Applications", organized by IEEE MTT-S Student Branch Chapter, Jadavpur University held during Dec. 27-29, 2020.
3. Mr. M. Vimal Raj, RS participated in the two-day Workshop on "Autonomous and Unmanned Systems" organized by the Department of ECE, Sri Sivasubramaniya Nadar College of Engineering during Jan. 22-23, 2021.
4. Ms. M. Akila, RS attended the one-day virtual symposium on "RF and Microwave Propagation" organized by the Department of Electrical and Electronics Engineering, BITS Pilani, on Jan. 30, 2021.
5. Ms. N. Kavitha, JRF participated & completed the ATAL Online FDP on "Wearable Devices" from Feb. 15-19, 2021 at Anna University.
6. Ms. M. Akila, RS delivered a 15 min demonstration on "Antenna array theory and polarization using MATLAB codes" towards the end of Dr. K.T. Selvan's online talk on "Teaching Electromagnetics in Modern times" organized by IIT Madras.
7. Ms. M. Akila, RS attended the webinar series on "Recent advancements in RF and Microwave Circuits and Devices" organized by Bennett University during April 05-09, 2021
8. Ms. M. Akila, RS attended the L4 Series online talk by Prof. Ashwin K Iyer, on the topic "Recent Developments in the Science of Metamaterials and Navigating the Metamaterials Landscape" organized by IEEE MTT-S KERALA SECTION and IEEE APS & MTT-S SBC GECBH on 21.05.2021.
9. Ms. S. Mary Cecilia, Mr. M. Vimal Raj and Ms. G. Annalakshmi, RS attended two days webinar on "Image Dehazing" organized by Mohamed Sathak A.J. College of Engineering on May 27-28, 2021.

CAMPUS STAR

"Inside INSEAD
-My international internship experience during a pandemic"

Aravindakshan Sanjay, a 2021 ECE graduate loves trying out new things! He is a recipient of SSN's "Walk-In-Walk-Out" scholarship and his drive to excel is apparent as he describes his experience . He recently secured an internship in INSEAD, a top business school in France, where he has been working as a Market Research Assistant under an esteemed professor. He graciously agreed to share his journey of securing this internship and also details about his work

About INSEAD:

INSEAD is a private university headquartered in Fontainebleau, France, with campuses across Asia(Singapore), Middle East(Abu Dhabi, UAE), and North America (San Francisco, USA). It is a graduate-only business school, that is revered worldwide for its 1-year MBA program. It is consistently ranked as the best business school in Europe and among the best in the world, alongside Harvard, Stanford and Wharton. Its MBA program has been ranked 1st globally in 2021, 2017 and 2016 in the Financial Times Global MBA Ranking. It produces the second most CEOs of the 500 largest companies globally, only after Harvard Business School's, and has a very strong alumni base in the Management Consulting domain. Known for its high internationalism, INSEAD accepts no more than 10% of students of the same nationality and has a very stringent acceptance rate. It also has exchange programs with other top B-schools like Columbia, Wharton and Kellogg.

Why did I choose to do a management internship?

Unlike many who are confident of what they are going to pursue after engineering from the word-go, I wasn't. I tried different things while at SSN. My first internship was with BSNL in the domain of mobile communication, followed by ONGC in the field of Communication & IT networks. I had done a couple of projects in ML and Data Science during my internship with Verzeo and worked with image processing and ML for my final year project. I'm currently also working on a project with a senior scientist at CSIR-CEERI. Now this may all look unstructured, and it probably is, but at least I wouldn't have regrets for not trying out new projects.

I have helped coordinate and organize around 20 major events in college, and was an active part of AECE, EDC, SMC and MUN. It was during this time that I realized I love managing things and interacting with people. After doing a lot of research online and talking to people about the nature of their jobs, it dawned on me that a career in business & management would suit me the best. Some of the fields that interest me are Management Consulting, Investment Banking and Product Management. It is almost impossible to get into the above-mentioned jobs immediately after engineering as all these entail prior work experience and an MBA degree. I asked myself what I could do now that would help me get one step closer, and the answer was to do a research internship in a business school. So, this is how it all started.

Application Process:

In March 2020 I had received a summer internship offer from a professor in IIM A. But unfortunately, I couldn't take it up due to the onset of the pandemic and uncertainties surrounding AU semester exams. Placements too were just around the corner and I wanted to give my full attention to preparing for placements. At that time, I didn't apply for a foreign internship because I didn't have the money to finance my stay for 3 months in a foreign country. Then came placements and it went off pretty well. I got a full time offer from a super dream company and was quite free after that. I decided to apply for an internship, and after multiple rounds of interviews, got an offer to do a marketing internship from the FMCG giant, Nestle. Just when it was about to start, I tested positive for Covid and with a heavy heart I had to cancel another amazing opportunity. By the time I had recovered, they had replaced me with another intern. My disappointment was palpable.

But like my man Dwight (from 'The Office'), I didn't give up. I tried messaging people on LinkedIn, but that didn't work out. With a steely determination, I then took it upon myself to secure a foreign internship. The travel ban due to the pandemic worked to my advantage and I seized the opportunity with open hands. I did thorough research for about a month, going through the profiles of many professors from top business schools in USA and Europe. The next month, I cold emailed around 120 professors whom I had shortlisted. Each of those emails were customized and were specific to that particular

professor. This was tedious and probably the most difficult part of this entire process. I had attached my Resume, Statement of Purpose and a brief Cover letter. I was honest in my approach, told them about my experiences, why I would be the perfect candidate for interning under them and most importantly why this internship meant so much to me.

Out of the 100+ professors I mailed, only around 15 replied, and 12 of them said "No" citing their lack of time. Out of the 3 professors that replied with a "Yes", I chose the one from INSEAD, because I resonated more with his research work. But this was still a provisional "Yes". He first wanted to assess my efficiency and punctuality before giving me the position. I was asked to research a famous Drink Mixer company, and was told to evaluate their advertising campaigns, marketing strategies and present my detailed analysis on what set them apart from their competitors. I was also asked to collect marketing variables from over 200 research papers and had to categorize them according to certain criteria. Thankfully, I was successful in doing these tasks within a short period of time and was finally offered this role. The entire process was excruciating and needed a lot of patience, but it was all worth it.

What work do I do there?

I have been interning for the past 5 months and although I can't divulge much information as the internship is ongoing, I can give you an insight into the kind of work I do there. Thanks to Corona, all communication is through E-Mails, WhatsApp and Zoom meetings. I help my professor with his current research work and Case studies, by performing Market research and collecting lots of data. I interact with his student (currently pursuing MBA at INSEAD), and fellow interns like me working under him. These fellow interns are from top institutions like London Business School, Singapore Management University, IIT's, Bits Pilani and Delhi University. Such a diverse team with the brightest minds makes for enriching conversations.

I have completed a few projects involving detailed research on global smartphone penetration, covid uncertainty & fear, international payment gateways, to name a few. We are currently conducting market research for a "Real Money Gaming Company" and identifying new potential markets for it to venture into. Major chunk of my work involves collecting research data for analysing consumer sentiment across 62 countries all over the world, for a period of 10 years. We then work as a team to build ML models to derive valuable insights on the multitude of variable data collected across various domains and present our solution. And this is where my tech/engineering background comes in handy, as I have already worked with ML. There is a huge scope for learning here and I am squeezing as much knowledge as I can from this internship. The fields that I would like to get into, rely heavily on the entry level analysts who perform market research and derive insights from the data collected. This is why I chose to do Market Research.

What are the best and worst parts about this internship?

Definitely the worst part of the internship is not being able to visit the beautiful Fontainebleau campus in person and spend time exploring France. Being a food connoisseur, it was a pity that I couldn't soak in the gastronomical escapades that the country had to offer. But that is something that is not in our control. I'm glad that I at least got to do this internship online. Undoubtedly, the best part is the international exposure it has given me. Getting to interact with and learn from such a professor is the stuff dreams are made of. The way they approach the problem at hand and analyse data is fascinating to say the least. On a side note, these professors really value your time and compensate accordingly. I was thrilled to get my first ever salary, that too in Euros. It was a totally surreal feeling.

Advice to juniors

I would like to leave you with one thought – "It's better late than never". If you are in your 3rd year and have still not decided what you want to do, don't worry. I was in a similar situation. Follow your gut, explore all possible options out there and discover what you would like pursuing. Take the first step and most importantly work towards it. If it is going to be management, try leveraging your prior experiences for landing good internships with either B-schools or companies. Don't look just for the brand name, look forward to working hard and learning as much as you can. Take part in club activities and hold leadership positions if possible. There are a handful of management companies that come to SSN for placements. Even though they don't directly hire for consulting/marketing/finance roles, do consider sitting for those companies as you would have the opportunity to slip into management roles after a couple of years with the company. You can always do an MBA/MiM after gaining some work experience. I know that the shift from an engineering to a management/business role can be daunting, but it is 100 percent possible and worth it. I have already taken my first step towards making my dream a reality, when are you going to take yours'? If you have any doubts, please feel free to connect with me on LinkedIn. I will be glad to answer your questions.

Aravindakshan Sanjay

Final Year ECE A

Smart India Hackathon 2020

Smart India Hackathon is a national level digital product development competition where students are challenged to come up with innovative solutions for different problems posed by many central and state ministries, industries and organizations. It is organized annually by the MHRD and contains two editions- Software and Hardware. Students of SSN have always risen to the occasion and proved their mettle every year and SIH 2020 was no exception.

We spoke to Sai Deepika from final year, whose team was the runner up in the hardware edition of SIH 2020. Her team consisted of Tejaswini P, Sai Deepika I (ECE), Vigneshwar Veeravagu, Vishal Mohan (MECH), Guruprasad Gupta K and Hashmat Jeelani Banday (EEE). Their problem statement was - **Remotely Operated Vehicle (ROV) for inspection of the HRT (Head Race Tunnels) in Hydro-electric plants**, under the topic Robotics and Drones- put forth by the Ministry of Power. The product involved building an ROV, (which could also be described as an underwater drone) which was a tethered vehicle controlled with the help of a joystick.

The SIH 2020 had six levels of evaluations- a new development from previous editions which consisted of only 3 levels. The first three levels involved an internal hackathon which had almost 90 teams applying from various departments. Abstract submissions were used for evaluation and around 51 teams were shortlisted for the next round. The second round was conducted in the form of a two-day hackathon in the ECE department and shortlisting criteria was mainly based on efficiency and the ability of the product to solve the given problem. The final round was the most competitive and the shortlisted 11 teams were evaluated by a panel of professors across all departments and 5 teams for software and 2 teams for the hardware edition were selected to participate in the Smart India Hackathon.

The actual hackathon had around 39 submissions for the team's chosen problem statement and they were gearing up for three more levels of intense evaluations. Like most things in 2020 however, Covid, lockdown and quarantine affected SIH teams as well. The first round was being held during the peak of the pandemic and with campuses closing and lockdowns initiating, the team didn't have access to labs and testing facilities to observe, test and tune the product and preparing and presenting for the first round while being scattered around the city proved to be a major challenge. But through sheer determination, hardwork and coordination, the team came together in the worst of times to put their best foot forward and made it to the final round, which was the only round held offline in the entire hackathon. After a long journey that almost lasted a year, results arrived and the team was announced the runner up for SIH 2020 for their problem statement.

On asking what was the most rewarding part of this whole experience, Sai Deepika is quick to tell us it's definitely the bonding shared by the team. All the unprecedented events, unexpected changes and challenges taught them many valuable skills and made them stronger and closer as a team. She encourages everyone to participate in hackathons for the new experiences, bonding with a team, working together to meet timelines and deadlines and coming up with new ideas and innovations. There might be setbacks and obstacles, she says, and adds with a chuckle-"Just keep going for it."

- R Samyuktha
2nd Year,B

SUMMER RESEARCH FELLOWSHIP PROGRAMME

Shwetha S, a third-year student from ECE, is amiable, fun, and interesting to talk to. She vividly supports the dreams of aspiring students. She is the recipient of the prestigious Adobe Women in Technology Scholarship and was also selected for the Micron Global Women's Mentorship Programme. She is currently working as a Research Intern at Adobe Research Bengaluru. Last year, during her summer break, she completed an internship at the Medical Imaging Lab, IISc, offered through the Summer Research Fellowship Programme (SRFP) . We got in touch with her to know more about her exciting experience. Here is a transcript of the interview.

✓Can you tell us about SRFP? How did you come to know about this internship?

This internship is conducted jointly by the Indian Academy of Sciences, Bengaluru, the Indian National Science Academy in New Delhi, and The National Academy of Sciences, India, in Allahabad. The Science Academies' Summer Research Fellowship Programme enables students and teachers to work with scientists associated with the three Academies.Initially, seniors from the 2020 Tech Club mentioned this internship in one of the weekly sessions. A friend of mine also reminded me about the same and pressed me to apply without delay, and so, I did.

✓ How does the application for this program work?

The application for this program makes you choose your area of interest (From categories such as Computer Science, Electronics, etc.). The student has to submit scanned copies of marksheets from class X until the last semester examination and, most importantly, a write-up (in about 150-250 words) that describes what they want to learn and achieve. Students are also required to provide the email ID of one of their teachers familiar with their work. The Academy will then approach the faculty for a recommendation letter. The application form also has other sections that ask about extracurricular activities and projects.

✓ How are students selected for the fellowship?

The applications submitted by the students are processed by the academies' and professors choose the students they want to work with. The process is very opaque, and students do not get to choose the faculty. Usually, 3rd-year students are preferred over 2nd-year students as they have more domain knowledge. Good CGPA, projects, and Hackathons help in making you stand out from the rest of the crowd.

✓ What are the boxes you have to tick to get into this program?

Work Experience is key for most research programs. If you are applying as a second year, it is best to have some relevant projects. You have to keep in mind professors usually select third years over second years, so don't get disheartened. It always does good to have relevant projects and courses on your resume. Hackathons are also a good add-on. There isn't an exact list of things that you can complete to get into such programs. At the end of the day it all comes down to how you show your commitment to your area of interest in that application. A large number of students from all over India apply to this program, so it is a bit difficult to get selected.

✓ Do courses enhance applications to such programs?

Doing courses cannot harm your application, but they may not enhance it all the time. For this program, you won't know which Professor is going to look at your application. So, the courses you complete may be irrelevant. In my second year, I had completed projects on biomedical instrumentation and Image Processing. I had also completed the course, Machine Learning by Andrew Ng and a couple of other image processing courses. I feel that the projects made more of a difference than the courses.

✓ Can you describe your internship experience?

I was selected to work under Dr. Phaneendra Yalavarthy, the head of the Medical Imaging Lab at IISc, Bengaluru. My internship was for 8 weeks. Each day I would narrow down the tasks I wanted to complete and then I would update a Ph.D. student and the Professor on my progress about the same. I was also asked to come up with ideas that would then be filtered based on feasibility and applicability. We had many brainstorming sessions and insightful conversations to decide our approach to the problem statement.

As an intern I also had to read a lot of research papers. To be specific, I worked on Estimating Tracer Kinetic Parameters from undersampled DCE-MRI data using a Non-Linear Tracer Kinetic model. I had to spend some time initially to get comfortable with the signal processing concepts behind DCE MRI. I used MATLAB for the entirety of the internship. I was given access to a high-performance computer at their lab to run my experiments.

This internship gave me insight into how research is carried out in premier institutes like IISc. This internship exposed me to a lot of exciting fields such as Tracer Kinetics and MRI Physics. I also learnt to manage my time very well. The internship also helped me get used to steep learning curves. Within two months, I was able to get good results for a highly non-linear optimization problem.

✓ Do interns get the opportunity to publish their work?

I feel that two months is very little time to get good results on a problem statement. In my case, even though I knew Image Processing and was comfortable with most Python libraries, I still had to spend some time getting myself acquainted with the relevant concepts. Though most internships do not result in publications, the program requires the intern to submit a 4-week report and an 8-week report. The eight-week report's structure is very similar to a research paper and is published on a web portal. You can always request the Professor to continue working in their lab.

✓ What are some of the benefits of being a Summer Research Fellow?

The Summer Research Fellowship Programme is very prestigious, and as only 400 students are selected from all over India (for Engineering Internships), it will help you stand out from the crowd. Research internships help you gain experience and insight about your areas of interest. The knowledge that you gain by working in labs under experienced professors is invaluable. As a fellow, you also receive a stipend for the period of 2 months.

✓ What is your advice for students who are taking up internships?

Do not hesitate to ask questions. Always clarify your doubts as soon as possible because it will be hard to rectify mistakes towards the end of the internship. Also, don't hesitate to ask for help from friends and seniors if you are stuck somewhere. And most importantly, take enough breaks, cut yourself some slack, and just try your best!

-Balambal S
2nd year, A

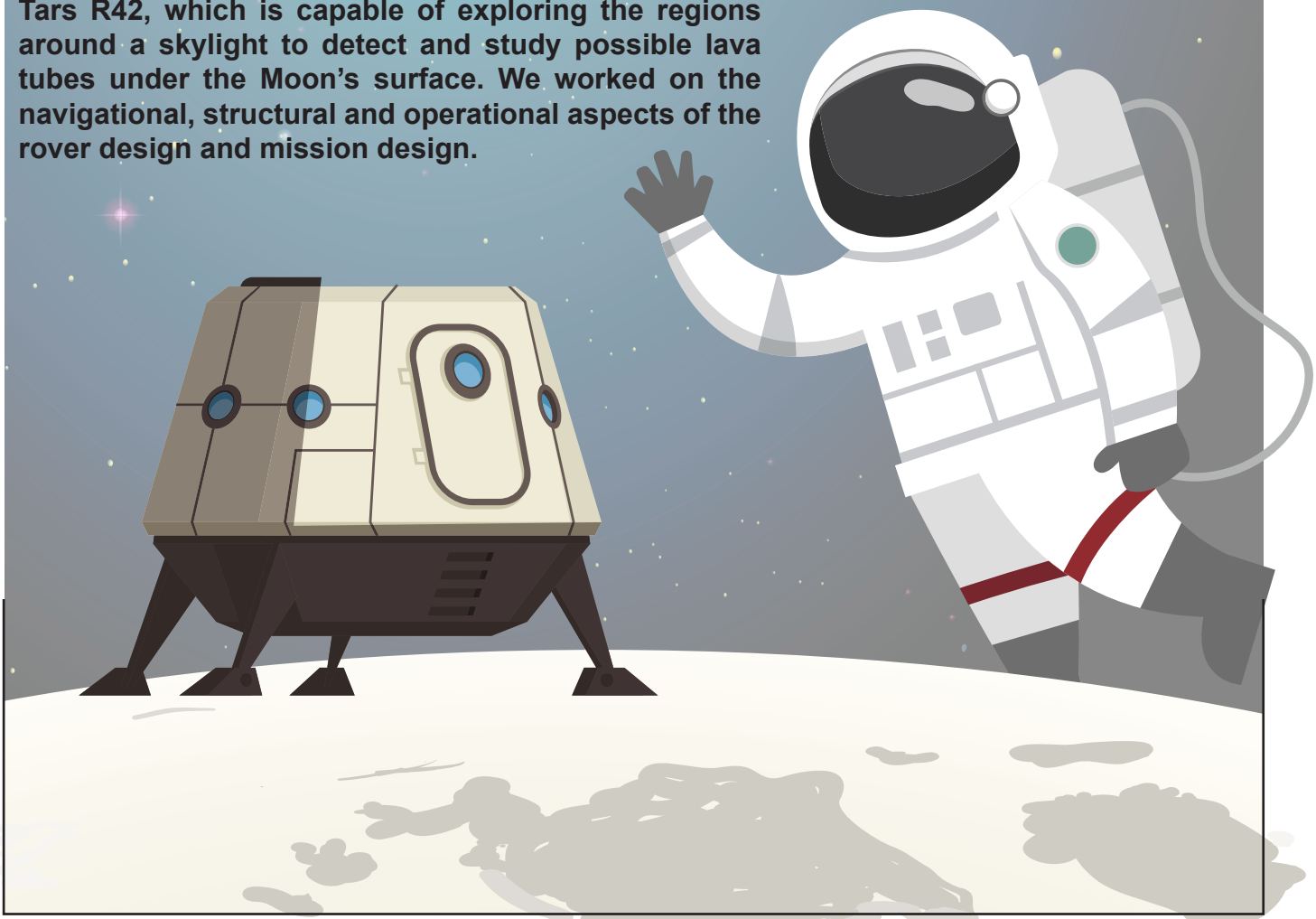
ALUMNI CORNER

SINGAPORE SPACE CHALLENGE

Ms. Shilpa J R and Ms. Varshini Kannan of Class 2020 have participated and won a merit award in the Singapore Space Challenge 2020. Here is what Shilpa has written to Dr. Selvan (FYP Mentor)

The competition, called Singapore Space Challenge 2021, is an annual technical design competition held for youths from 15 – 25 years old. It challenges youths to design complex space-related and advanced- technology projects that are largely graded on creative engineering. This year over 120 teams from 80 countries participated in this competition. From this year onward, it is going to be renamed as International Space Systems Challenge.

Our submission was the design of a lunar rover called Tars R42, which is capable of exploring the regions around a skylight to detect and study possible lava tubes under the Moon's surface. We worked on the navigational, structural and operational aspects of the rover design and mission design.



SOCIAL MEDIA DETOX - OFFLINE IS THE NEW LUXURY!

When we decided to write an article, we found this neologism – Social Media Detox. The term defines the process of abstaining from social media to get rid of unhealthy usage. Nearly 60% of the world's population is already online, so no wonder it is dumped with lot of information. Social media app, "Moment" collected data from people's usage on social apps, discovering that there's a happiness breaking point for each platform. For Facebook, spending longer than 23 minutes can result in an unhappy experience and for Instagram, the threshold is 31 minutes. Despite keeping us updated about the happenings in others life, we fail to realize that we have lot to do with our own. If you are feeling like you aren't good enough, pretty enough, or successful enough while consuming what's in your news feed, then it's time for a social media break and direct your attention elsewhere.

How to do a social media detox:

- Uninstall all frequently used applications and attend only calls.
- Read newspapers and solve puzzles.
- Plant a seed from your kitchen and take the responsibility of watering it regularly.
- Meet your grandparents and spend your time with them.
- Do some for your mental health - go for a drive, walk or play.
- Enjoy and taste the food you eat. Appreciate the one, who made it for you with love.
- Put your phone away from your bed and set an alarm in your watch for next day.

During a social media detox, if you are trying to break it, remember,

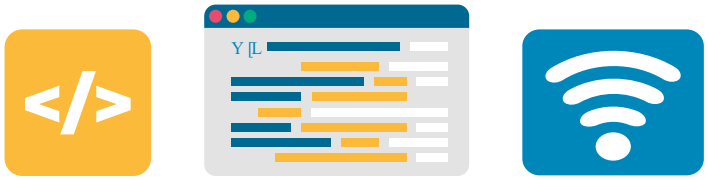
- If a person really needs you, he will call you.
- The flaunting pictures doesn't mean that "Everyone has a perfect life" in reality.
- The number of likes/dislikes doesn't determine who the person really is.
- What is the use of expressing your thoughts as a status?
- Anything that shakes your inner peace, self-esteem and confidence should be under control.

To ensure that social media has a positive impact on your health, it's important to know your usage limit. A social media detox, no matter the time you spend away from it, be it hours, days, weeks, or even months, can improve your mental health. In fact, it reintroduces us to the real world. If you're not ready to take a big step away from it, little steps are certainly recommended. See how you like it at first, then see if you can enjoy more time away from it and if it truly benefits your life and mental health.

- LENA DSK & RENITA J
ME communication systems
(2015-2017)

A Conversation with Kashyap Ravichandran, NCSU

The Bay Area (a.k.a Silicon Valley) has always been the ultimate destination for those interested in the software and related industries. Among those alluring fields is computer engineering which is one of those rare fields that combine the best of both worlds of engineering involving the wonders of coding and the satisfaction of seeing its realisation in a tangible way. We spoke to our department's own **Kashyap Ravichandran** who very recently graduated from **North Carolina State University (NCSU) with a Masters degree in Computer Engineering**. A tech enthusiast who's interested in **Embedded systems and Computer Architecture**, Kashyap is all set to join **AMD** as a **Silicon design engineer** very soon.



What drew you towards the field of Computer Engineering?

I was initially interested in embedded systems. I've enjoyed working with machines like the Arduino and Rpi boards. The feeling you get when you've put something together or added something for the first time and you see it work in front of you like when the motors start rotating, it's very fulfilling and that is what I wanted to do. I wanted to do something that has hardware but also involved writing code because I love to code as well. Embedded systems was the place where I could do this. During my masters I had to take a course on Computer architecture and I really liked it so I ended up pivoting towards it.

What was it about Computer Architecture that you enjoyed?

You get to see how a modern processor works. It was really interesting and it just hits you. You really fall in love with it and you understand how a machine works the way it does. There are certain things that make you go 'Wow, I wouldn't have thought of that. I'm so happy that I've read about this'. That feeling draws you in. There is always something that all of us come across that hits us like that and that is where you should focus on. I remember that in my undergrad VLSI course there's something you learn called a barrel multiplier where you rotate the bits to multiply them and this was one of those things that hit me. There is this sense of joy that you get; that feeling of the world just clicking like a puzzle piece fitting correctly.

How did the job search work there? Did you have a placement process of sorts?

At NCSU we didn't have a placement process as such, we had 'Connection meets' where we met with recruiters from various companies. You give an elevator pitch where you introduce yourself, talk about interests and aspirations etc and give them your resume. Eventually recruiters would get back to you and conduct an interview after which they'd move it to a screening call, then a panel interview and finally an offer would be made. This is the typical process followed but companies may shake this up. Applying online is the easiest way to make sure a recruiter sees your resume. You might even have to apply to 100s of positions before something finally works out. Work experience tends to matter a lot and since I did not have it, I had to apply to a lot of positions to increase my chances of getting a job I wanted.

So what made you choose this university for your masters?

I actually got admits in UTD (University of Texas in Dallas) , NCSU and in Georgia Tech's France and China campuses. I wasn't interested in studying in China and the campus in France did not specialise in the area I wanted;they were more focused on solar cells, photo electronic devices etc. When comparing the programs at UTD and NCSU, I felt NCSU was a better choice, it fit me better and I was keen to work under one of the professors there.

When it comes to choosing which universities to apply to, how does one decide if a university is 'safe', 'moderate' or 'ambitious'?

There are some schools that are definite 'safe' and 'ambitious' schools. Universities like UTD are considered safe by the vast majority while universities like CMU, UC Berkeley, Cornell etc are ambitious. So both ends of the spectrum are rather fixed. The middle however is not. The 'moderate' universities are subject to change based on the person. A good idea would be to go through the official website and other online resources that are abundantly available which discuss things like the average GRE/TOEFL/IELTS scores and the average GPA the admitted students had. These things can help you evaluate the likelihood of getting an admit. So if you're well above the average then your chances of being accepted are higher. A moderate university would be one where you have 50% chance of getting in while safe is around 75%. Sometimes these admits can be a bit random, you might get rejected by a safe school and get admitted to an ambitious one. So don't apply to schools that are too safe though because they know that you mostly won't come there and might just reject you. Apply to 12 to 15 universities and choose them wisely.

When it comes to the application process there are many important parts of our application with the LoRs and SOPs at the top of that list. What are some tips and suggestions you would give for these?

If I were to write SOPs now, I would make sure that I would tell a story. I would not start with some boring quote because that's just overused. Try to come up with some important points and weave them into a good narrative. Bring up relevant incidents and details. Make sure you embellish it with some technical details as well but don't go too deep into it. This is just to make sure the reader gets a good idea of what you have learned and worked on so that they can understand the story you're trying to tell them. Don't just tell them you made a classifier but talk a little bit about it. You should finish by saying how this lab and this university is going to help you in your journey.
When it comes to LoRs, most of the faculty give out amazing LoRs to their students. Getting an LoR from a faculty member that you've worked under on a project or internship would be best. Next I would say are those from professors who have taught you and interacted with you on a regular basis. LoRs are really important so try to get them from professors who are working in your domain of interest that know you.

What are some other things you would recommend students to focus on to boost their admit chances?

Having a good CGPA and good GRE/TOEFL/IELTS scores are really important. It's also important to do relevant projects and internships. This is especially true when you're trying to switch fields like from ECE to CS, which is a bit harder to do. When it comes to internships, it helps if you have interned at places that American Universities might recognise. While the work you do at startups is really valuable (which is very important) , the brand value of a company or university helps sometimes. They'll be able to comprehend the structure and your experience at that company. So it's good to have an array of experiences listed like working at startups, universities, MNCs etc. It all helps.

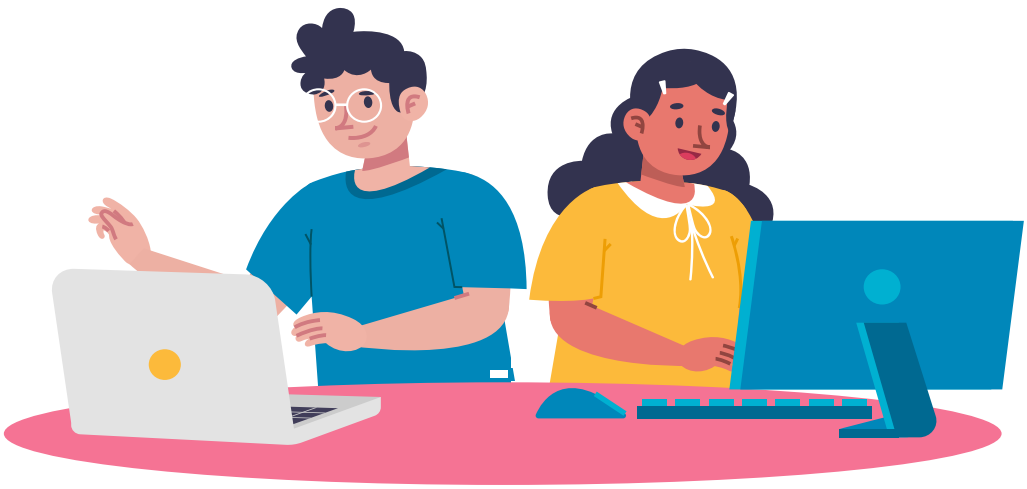
One of the biggest concerns with studying in the US is the financial costs one would have to incur to study there. What are suggestions to students who are concerned regarding this?

For someone who is genuinely interested in doing a masters and studying abroad I would suggest studying in Europe. The tuition fees at European universities are significantly lower. For someone who wants to come to the US, I can reassure them that it isn't that hard. State universities tend to be cheaper than Ivy league universities. So they can definitely study in state universities. Universities like UCSD have a higher name value than state universities but also tend to be cheaper than Ivy League ones so they are some places you can apply to as well.

Is there anything else you would say to prospective Masters students?

You'll have the time of your lives when doing masters abroad. It'll be your first adulting experience as most Indian students have probably been living with their parents till this time. You'll have to manage your own finances and do your own chores. These things give you a sense of responsibility. You get to meet a plethora of people from various backgrounds. You get to work at a lot of companies that you've looked up to and you've grown up hearing about. Your chances of joining such companies just shoot up after doing a Masters abroad. Computer Engineering is a really fun subject and I would really encourage juniors to consider exploring this field. It is something we've learned about during your undergraduate studies and it's easy to learn. You get to appreciate what's happening in the world around you.

- Nimisha Pabbichetty
3rd year, B



Aparajith Srinivasan, CMU

The world is now captivated by machine learning, deep learning, and computer vision as scientists try to "Make machines think like humans". In other words, these fields find solutions for problems by making machines learn intuitively with the help of acquired knowledge. This is analogous to how we apply the wisdom and experience we acquire in our respective lives. So, here we have Aparajith Srinivasan, Domain Head of Tech Club: Machine Learning, ECE batch of 2021, to impart the wisdom gained through his college life. He will be pursuing a Master of Science degree in Electrical and Computer Engineering from Carnegie Mellon University, Pittsburgh, USA.

What made you choose your area of interest and CMU for your masters?

The Smart India Hackathon (SIH), Hardware edition (2019) helped me decide my area of interest, choosing Machine learning over IoT. I learned more by using platforms such as Coursera, youtube, etc., and developed my coding skills through various hands-on mini projects .Apart from these, internships, confrences, and hackathons were crucial steps in my learning process. They also elevated my interest in domains such as Deep Learning, Computer Vision, and Image Processing.

I chose CMU because it has a very high research output. The programs are also flexible. This will help me enroll in courses that are relevant to my areas of interest.

How did you prepare for competitive exams such as GRE and TOEFL?

I wrote GRE and TOEFL in September-October 2020. The English section in both the exams is complicated, so I started to learn five new words every day from December 2019. In a nutshell, it is best to learn 600-1000 words for better preparation. My overall preparation time for GRE was two months, excluding the breaks I took in-between. I prepared for nearly one month for TOEFL (to be precise, 25 days) as I wrote it just after GRE. Preparation for the English section in GRE will be a prerequisite for TOEFL preparation as well. I used ETS preparation books and Magoosh mainly for my GRE and TOEFL preparation.

How to choose a university for MS admissions?

I believe that college rank is not the only key factor when choosing a university. There are both coursework-based degree programs and research-based degree programs when it comes to post graduation. Students passionate about research must look into the work done in labs and the professors' research and make sure that these are coherent with their areas of interest. People who are interested in getting a job after MS can look into the coursework-based programs.

It would be best to look at both coursework and research-based programs offered by the universities or particular departments to understand better how much it matches your area of interest.

Acceptance is key during MS admissions because there may be many erratic rejections, even if you have an excellent CV. "Just believe in yourself and give your best because your efforts may land you up in the university that suits you the best."

I don't think applying to ambitious universities along with safe universities, is a risky move. You won't regret applying to the dream universities you always wanted to get into, even if you didn't get one. It will make you feel satisfied for trying your best in something you always wanted to.

"If your dedication and hard work are unbeatable, luck may land you in your 'Dream Destination' and in this case, your 'Dream University."

How to build a good profile for MS admissions?

In my opinion, CGPA plays a vital role. In general, universities prefer a good GPA in the subjects related to the programs you choose (especially top tier universities). However, it's not the only deciding factor as SOP, LOR, GRE, TOEFL scores also matter. Those who are into research must have done more relevant projects to highlight their profile. Students aiming for both coursework/research-based programs should focus on the quality instead of the quantity of their projects. The selection committee is interested in your practical knowledge and skills in the respective domains rather than the number of projects you did.

Research Internships in reputed colleges like IITs, IISc are an excellent add-on to one's profile, especially for research-based programs. Internships at startups also help to get into coursework-based programs. Publishing papers enhances documentation skills, and papers validate the projects in your profile. Participating in hackathons highlights your ability to work under pressure. Positions of Responsibility also enhance your profile.

Your SOP is something that will make the selection committee remember you among the thousands of applicants. So, make sure it's very unique and it defines you as a person. Request your friends and family to proofread your SOP as it personally helped me in making corrections and improvising my SOP. I firmly believe that an eye-catching introduction along with a clear body helps to build very good SOPs.

Tell us about some of your notable projects, internships, and papers you published.

I began doing projects by the end of my 2nd year. First, I worked on my internal funded project based on my main area of interest ML, along with IoT. It was an Intelligent Child Safety System using Machine Learning in IoT Devices in which, we developed a smart wearable device with Arduino, Raspberry-Pi, sensors, and modules. This autonomously detects dangerous situations faced by a child using a Decision Tree Classification Algorithm and sends alerts using GSM and GPS. We also published the work as a paper in an IEEE conference. Another notable project was done based on one of my areas of interest i.e deep learning in computer vision, image processing, and analysis is CCTV Road Accident Detection using DEtection TRansformers (DETR), where we developed a deep learning model to detect road accidents in an image frame using Detection Transformer (DETR) in PyTorch.

As I mentioned earlier, I was a research intern at the Council of Scientific and Industrial Research in the year 2020. My work was on developing a multi-task U-Net-based deep learning model to detect incubation of COVID-19 using chest CT Scans.

I presented 5 research papers IEEE international conferences, two of them were notably, from Valencia, Spain on Road Accident Detection using DETR Algorithm and from Charlotte, NC, the USA on Elder Care System using IoT and Machine Learning in AWS Cloud.

Projects, internships, and papers helped me in exploring my area of interest deeply.

Share your experience of participating and winning in the Smart India Hackathon(SIH), hardware edition.

Hackathon is basically a timed event that tests your adaptability, perseverance, and ability to work hard under pressure. You have to transform your idea into a commercially viable product for the problem statement given. Thus, as a prerequisite, one must have very good coding skills and knowledge about the topic. Presentation and marketing skills are the major key factors of a hackathon apart from the knowledge you impart.
It was a five-day hackathon, and we were a team of 6 named “Infinity Clones” along with our mentor, Dr. Jino Hans. Our problem statement was based on Oil health monitoring. We were shortlisted for the final round after our ppt and video presentation. Though our first-day review was not up to the mark, upcoming reviews boosted our confidence, ultimately leading us to the final presentation, where we had to present to the GM of TATA. Though we were nervous, we ended up winning the 1st Prize Winner of Smart India Hackathon (SIH), Hardware Edition. As I said earlier, it was a deciding factor and helped me choose my domain, and it was one of the greatest learning experiences of my life.

What are you passionate about? Who are your role models?

I’m a passionate musician who loves to play piano, guitar and I am also getting trained in Indian classical music. I prefer to be called a pianist or a guitarist rather than a singer. Music was something I always wanted to pursue as a career till my first year. Eventually, I started developing an interest in ML, DL, computer vision, and image processing.

I believe a Role model is not someone you can blindly follow because “All lives have different stories to tell even though some chapters may match.” Similarly, I have role models for different genres, say, for music, Illayaraja sir, and some western classical composers.

Talking about life, I would say, “My Parents are my Role Models.” I realized it after all my MS admissions and other things. They are the pillars that support and encourage me throughout my life. Their support and guidance help me overcome problems. I would specially mention my mom, who has always been my great support and confidence.

Any Words of Motivation for aspiring students?

If you are passionate about your area of interest, go for higher studies. There are different kinds of constraints in each case, especially when it comes to finances. But, there are several universities (especially in European countries) that offer funding and scholarships. Prestigious universities in India like IITs also provide excellent quality of education and are comparatively less expensive. Many Ph.D. programs are generally fully funded in foreign universities and India; thus, people who are into research can go for it. If you have a choice between higher studies or job, then I would always prefer you go for the former.

To sum up, ***“Give your best in the field you want to pursue, because your efforts and passion will make a difference! Aim High!”***

-Shwathi Ramanathan
2nd year, B

SAAMA TECHNOLOGIES

Artificial intelligence (AI) is more accessible now than it has ever been, and is increasingly being used to improve business operations and outcomes in various industries ranging from transportation, logistics management, finance, healthcare, retail, and many more. An Oxford Economics and NTT DATA survey of 1,000 business leaders conducted in early 2020 reveals that 96% of companies were researching AI solutions, and over 70% had either fully implemented or at least piloted the technology. AI techniques have now become effective tools for detecting patterns in data, thanks to advancements in computing power and algorithmic innovations. In recent years, Machine Learning has been touted as a must-have skill for engineers in addition to coding. But how does one pursue a professional career in this field?

Here, we at team Impulse interview **MS Venkatesh, an alumnus from SSN (ECE, Batch of 2020)** who is currently working as an **AI/ML Research Engineer at Saama**. His areas of specialisation include **NLP - Natural Language Processing and GANs - Generative Adversarial Networks.** Read on to find out how Venkatesh, a student with an ECE background went on to pursue a professional career focused in AI/ML.

As an undergraduate student, Venkatesh wanted to focus on the practical side of learning rather than the theoretical. In order to do so, he started off by taking part in hackathons and competitions. Hackathons are a huge learning experience. He attended his very first hackathon during his second year, Smart India Hackathon 2018. During the hackathon he realised there were so many new technologies and innovations out there that he didn't know about. He took that as a wake up call and worked towards improving his coding skills, and learnt how to convert ideas to code. It was then that he was introduced to Machine Learning via online courses. When asked which resources he referred to, he says Udemy courses offer a practical approach whereas Coursera courses offer a more theoretical approach to the subject. Apart from courses there are brilliant articles on Analytics

Vidhya, Medium etc. that one can learn from, he says. He recalls being so intrigued by the field initially that he knew he wanted to pursue it further.

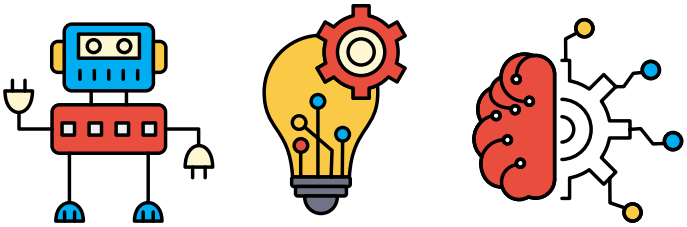
While working on a project that focused on calculating the azimuth positions of the sun based on the location, he initially hardcoded the formulas, but was quick to understand that so many environmental factors needed to be taken into account and hardcoding was not always the ideal solution. It was then he realised how machine learning could be used in its place and understood the importance of the field. Working on the project gave him new insights on practical applications of concepts that sitting in a classroom and learning from textbooks never could. “I had great professors who mentored me well. They helped me in understanding the practical applications of concepts”, he says.

Venkatesh was appointed as the Domain Head of Machine Learning at Tech Club, a position he held during his final year at college. As the domain head, he introduced junior members of the Tech Club to the field of Machine Learning. He says that although he was reluctant to teach, he actually learnt much more by interacting with the juniors. He found the experience to be extremely rewarding. He also dabbled in game development for a bit, built an AI enabled chatbot that utilises NLP and started writing blogs during the same time.

When asked about his current work, he explains that he is an AI/ML research engineer at Saama. Saama as a company focuses on “accelerating clinical trials by utilising AI”. He goes on to elaborate that before clinical drugs reach the market, their side effects and results need to be verified. This is done using clinical trials on a diversified group of people. Such trials generate huge volumes of data that need to be analysed and evaluated, which can take an unnecessarily long amount of time. Saama works towards reducing that time gap using Artificial Intelligence. Venkatesh started out as an intern at Saama. The interview, he says, was unlike others. He was given a problem to solve, and was judged based on his approach to the problem and his analytical and problem solving skills. While interning, he met passionate engineers who could work on 10 different models in a day and never found it taxing, inspiring him to aim higher and achieve bigger goals. They taught him a lot, he says and as a company they focused on the quality of work rather than work hours, which worked in his favour. The company also played a crucial role in accelerating the clinical trial of a major pharmaceutical company’s COVID-19 vaccine, which Venkatesh was a part of. “It was an exciting experience!”, he says.

On asking what advice he’d give his juniors, he says

“Never go hard on yourself when you meet people who know more than you do. Use it as a motivation to work hard and learn better. You need not prove yourself to anyone, but you owe it to yourself to become better. Never wait for the right time, start now. You can always teach yourself what you don’t know”.



- Vinu Abinayaa R
2nd year, B

STUDY CORNER

NANO ELECTRONICS

In the last few decades, the capabilities of electronic devices have shot up exponentially. Advancements in semiconductor technology have improved electronic devices' abilities while simultaneously reducing their size, weight, and power requirements. These advancements follow Moore's Law, which predicts an increase in processor performance due to greater and greater miniaturization. However, as the proportions of electronics get closer to atomic size, different forces have more influence than those that dominate at the macro-scale. Nanoelectronics is the field that deals with a diverse set of devices and materials, with the common characteristic of being so small that inter-atomic interactions and quantum mechanical properties need to be studied extensively. The field of Nanoelectronics may very well answer the increasing demand for small yet high-performance electronic devices.

To gather more insight about this exciting field, we interviewed **Dr. G. Durga**, who is actively working in Nanoelectronics.

1. Can you give us a brief introduction to Nanoelectronics?

Nanoelectronics makes the existing things smaller. This field deals with developing and controlling electronic components in the nanometre (nm) scale using materials' electronic properties. In the nanometre regime, the electron movement is not because of conventional electronic charge but due to quantum mechanics. Nanoelectronics includes research on quantum mechanical tunnelling devices, spintronics, single electron devices, nanotubes/nanowires, and so on. Electronics are widely used, and hence well-developed Nanoelectronics can be applied in different fields, like Electronics and IT sector, Agriculture, Medical applications, Automobiles, etc.,

"The Next Big Thing Is Really Small: How Nanotechnology Will Change The Future Of Your Business"- a book by Jack Uldrich and Deb Newberry described the future of this revolutionary field effectively two decades before.

2. What are some recent, exciting breakthroughs in the field of Nanoelectronics?

Many breakthroughs are happening through the use of Nanoelectronics in different fields, and some of those are listed below.

Medical applications: Improvements in drug delivery method - a precise and non-toxic nanoscale technology can deliver oncology drugs directly to cancer cells. Early detection of disease is done by using nanoparticles as a biomarker/indicator and so, diseases like Alzheimer's and cancer can be detected early and cured in the beginning stage.

Agriculture sector: Crop protection and livestock productivity - monitor plant growth, detect plant and animal diseases. Nanocapsules can deliver fertilizers and pesticides to plants efficiently.

Renewable energy source: Making solar cells with better light absorption, efficient conversion of light to electricity, improved storage, and transport of solar energy.

Automobiles: Many advanced electronic sensors are used to improve the performance of vehicles.

3. Can you mention some significant applications of this technology? How is it leveraged for industrial applications?

Nanoelectronics and Nanotechnology contribute more to the design and development of ultra-fast, extremely small, and highly portable systems. Major applications of Nanoelectronics in industries are,

i) Electronics Industries: Flexible/bendable/plastic electronics used in wearables devices and the IoTs.

ii) Medical field: Nanomedicine – developing precise solutions for disease prevention, diagnosis and treatment.

iii) Energy sector: Enhancing alternative energy harvesting approaches like solar cells.

iv) Environment betterment - Nanoparticles are used to clean water pollutants and so on.

4. Where do you see this field in the next ten years?

In the future, Nanoelectronics will lead to enormous improvements in performance, power, functionality and reduce the cost of computing devices with the help of new materials and new device structures.

5. What are the prerequisites for a student who wants to work in this domain?

To work in this domain, a student must have knowledge of quantum physics and semiconductor physics. They must also have a basic understanding of semiconductor devices.

6. What are the elective options available in our college curriculum related to this technology? Can you also mention some standard texts and online courses that students can utilize to develop their knowledge in this domain?

Our department's UG curriculum offers an elective titled "Nano Electronics" in the V semester, and our PG VLSI Design curriculum offers an elective named "Nano Electronics and Technology."

Book references and online courses for fundamentals of Nanoelectronics:

Fundamentals of Nanoelectronics by Hanson, Pearson education, 2009.

Nanoelectronics and Nanosystems: From Transistors to Molecular and Quantum Devices by Jan Dienstuhl, Karl Goser, and Peter Glösekötter, Springer-Verlag, 2004.

Lessons from Nanoelectronics A. Basic Concepts, by Supriyo Datta Purdue University

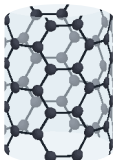
Fundamentals of Nanoelectronics: Basic Concepts offered by edX

Nanoelectronics: Devices and Materials - NPTEL

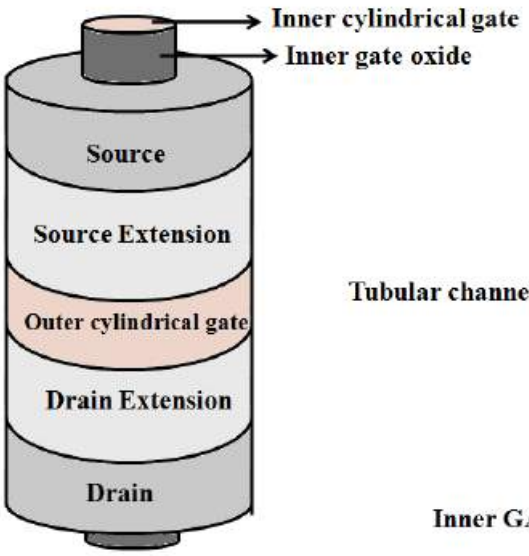
Introduction to Quantum Physics and Its Applications – NPTEL

7. What are the job opportunities available to students interested in this field?

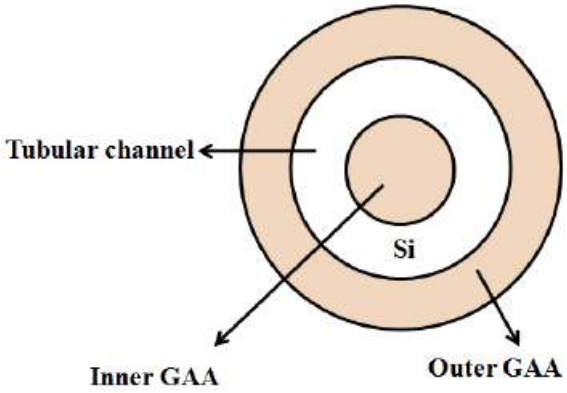
As electronics is present in all kinds of industries, there are many nanoelectronics job openings in food processing and packaging, forensics, electronic industries, textiles, polymers, automobile and aerospace industries, nano-biotechnology, pharmaceutical fields, etc. In addition, there are a lot of research openings in this field.



8. Can you briefly describe your research/projects in this field?



SiNT FET structure



Cross section of SiNT

My research is based on novel MOS device structures and their reliability to radiation.

One of my completed works is about silicon nanotubes (SiNT FET) in 45nm technology. The undesirable effects popping at smaller dimensions are known as Short Channel Effects (SCE). SCE is caused by the intrusion of the drain electric field into the channel, which reduces the gate control over the channel. Silicon nanotube FET (SiNT FET) provides a better scaling scenario compared to nanowire devices. The tubular channel of the SiNT structure is controlled by the inner cylindrical gate (inner GAA) and outer cylindrical gate (outer GAA). The two GAAs combinedly increase the immunity to SCE and offer better gate control than the Silicon nanowire structure, which has only outer GAA. Due to the presence of double GAA control, SiNT FET allows us to scale the devices below 100 nm while maintaining a good SCE performance. When the systems are deployed in the field, the devices have to face dynamic disturbances (a voltage/current pulse appearing randomly in time). One of the best examples is the radiation strike in the space environment.
We investigated this SiNT FET device and SiNT based circuits under heavy ion irradiation. Currently, we are working on Reconfigurable FET (RFET) based circuits.

We thank our professor, Dr. G. Durga who spared her valuable time to share her insights with us. We hope this article gives a clear picture on nanoelectronics to the students.

- Shwetha S
3rd year, C

INTRIGUE

The aim of art is to represent not the outward appearance of things, but their inward significance" - Aristotle

Dance is a form of art that involves movement of the body to music. It is a way of expressing an idea or an emotion. The way one dances can express happiness, excitement, passion, fear, and also anger. It is so much more than just grooving on the dance floor to our favorite tunes. Every dancer has a particular style that helps them bring life to the stage when they perform.

We caught up with Indu S, who is a Bharatanatyam dancer and also the current vice president of the Association of Electronics and Communication Engineers (AECE) She exuded charm and a sense of cheerful bonhomie in her speech. She has a very positive outlook on life. In the colloquy, she had shared all about her learnings and experiences in the field. Here are some excerpts from the interview:

How did you develop an inclination towards dance?

“Dance has been a part of me since my childhood. My mom is a classical dancer as well. I grew up watching her and slowly started gaining interest in the art form. My parents helped me identify my interest in Bharatanatyam, and that’s how it all started.”
She further adds that at the beginning, it was difficult for her to get up from the comfortable couch and attend dance classes every day. She says that she is very thankful to her teacher who encouraged her to attend classes so that she doesn’t lose her shine in the artform.

According to you, what are the important traits that a dancer should possess?

Indu emphasizes that it is vital for a dancer to have passion and patience to learn the art form. Passion helps in igniting the spark to learn the art, and patience is what helps in striving. She further adds that it is also equally important for a dancer to have perseverance and to show respect towards the artform. She says, “One needs to give respect to whatever they are doing. Only then can one learn and excel in their work.”

To put it in a nutshell, Indu says that “passion, patience, perseverance, and respect will help one excel in dance or any field, for that matter.”

Of all the performances that you have done as a dancer, which is your most memorable?

Indu enumerates two of her performances that she considers to be significant and very close to her heart. The first one is when she received state-level and national-level recognition for her dance performance. She says that she felt very much boosted and motivated after that. The second performance that she considers close to her heart is the arangetram that she did where she had to dance for 1 hour straight. She recollects that the performance was supposed to be for 45 minutes, but it got extended to 1 hour. She admits that she never really thought she could pull off a great show that day. She says, “I felt very much elated after that performance because I did something that I thought was beyond my limit, and I keep cherishing myself for it.”
Indu says that she feels blessed to have performed in front of Guru VP Dhananjayan sir, a Padma Bhushan awardee (2009). She regards it as her greatest achievement.

Who is your inspiration, and what made you look up to them?

“There are many dancers whom I admire and look up to. I can’t pick out a particular dancer. Every dancer has got their own style. The energy they bring on to the stage when they perform is immense. To name a few, I would say Guru Sri V P Dhananjayan and Smt Shantha Dhananjayan, my teachers Smt. Janaki Venkatraman and Smt. Rukmini Suryaprakash, Lakshmanan sir, the list goes on. It’s fascinating to watch them perform on stage, and I have gained a lot of insights and confidence watching their performances.”7

Can you name some of the accolades you have received for dance?

Indu has won a lot of accolades in the field. She reminisces few of her favorite ones. The first one is the CCRT Junior Fellowship award that she won in the year 2014. She elaborates that the award is a national-level scholarship given to young artists who excel in the art form. Under the Tamilnadu-Puducherry category, she was one of the five artists who received the award that year.
The second one is when she was recognized by the Iyal Isai Nataka manram of Tamilnadu in 2016. She bagged the third price in the contest. She says that getting recognized in state-level and national-level competition motivated her to achieve more in the field.

You are one of the department toppers and also the current vice president of AECE. It must be quite a juggling act, excelling in both academics and dance. How did you manage it?

"I try to schedule my plan. It's basically about time management and how we execute our plan." At this juncture, Indu thanks her parents for being her pillars of support. She says her parents encouraged and mentored her well in pursuing her passion. She goes on, "It's all a team effort – a team consisting of me, my parents, my dance masters, and my colleagues in AECE who helped me stay on track without losing focus."

Last year was quite challenging for everyone. All of us were shackled to our houses by the pandemic. What all did you do to stay physically and mentally fit?

"All of us glued ourselves to our systems during the lockdown. Everything became online, and movement was also restricted. Practicing Bharatanatyam helped me stay physically and mentally fit. It has helped me improve my general well-being and has boosted my self-esteem. Physical lockdown doesn't mean lockdown to muscles, spirit, and creativity. Our body has to function well. For it to function well, we need to take good care of it. Doing proper physical exercises regularly will nurture our physical and mental health and help in the long run."

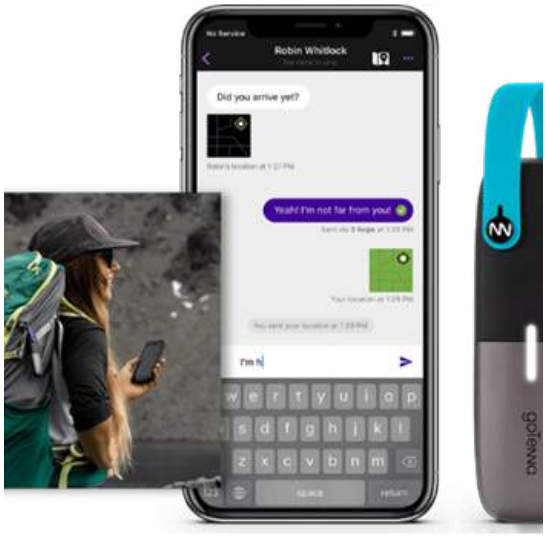
Tips to those who are trying to achieve in both academics and extra curricular activities.

Indu makes the answer crisp and to the point. She says, "Be passionate about what you do. List out your goals. Prioritize. Schedule your time and manage accordingly. You won't be able to give your 100%, but you'll definitely see progress in your work."

Varshini G
2nd year, B

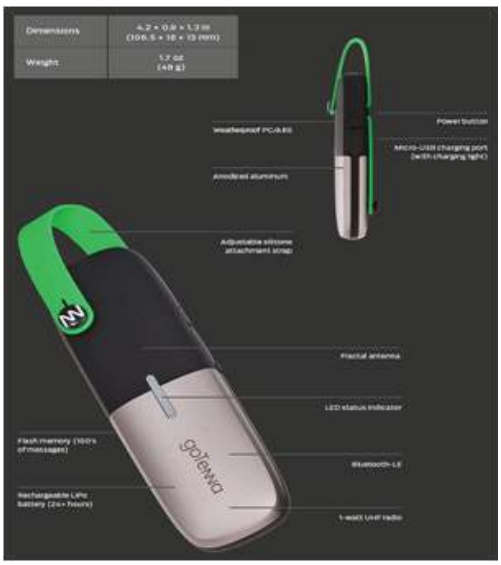
GOTENNA MESH

Cellular phones were invented with the aim of allowing users to communicate with anyone, anywhere at any time. But cellular phones do not work all the time, right? Ever experienced not having cellular service and wi-fi connectivity, especially in the case of an emergency?



Well, we now have a saviour in town! **GoTenna** Mesh is a small, lightweight hand-held device that enables us to remain connected with our peers even in regions where cell service is not accessible. This is setting a new trend in mainstream communication technologies using an ingenious paradigm: Mesh networking.

With the mission to extend the edge of connectivity, GoTenna mesh works with any smartphone and forms a mesh network right away for dispersed users to stay in touch in the absence of a cellular network or wi-fi. Users can download the GoTenna app (Android or iOS) to pair the device with their phone, acting as a typical messaging platform with message delivery confirmation. When adequately charged and paired with your smartphone **via Bluetooth,** GoTenna Mesh allows you to text one-on-one, send "shout" (broadcast) messages and share GPS locations instantly with your group, each having the device and app-configured phone. GPS locations can be accessed using offline maps. These maps allow us to view the whereabouts of other GoTenna-equipped people.



Its salient features include:

» Off-grid communication – service in the LAST MILE where there is no traditional cellular or internet infrastructure.

» Intelligent mesh networking – Resilient network, can extend the range

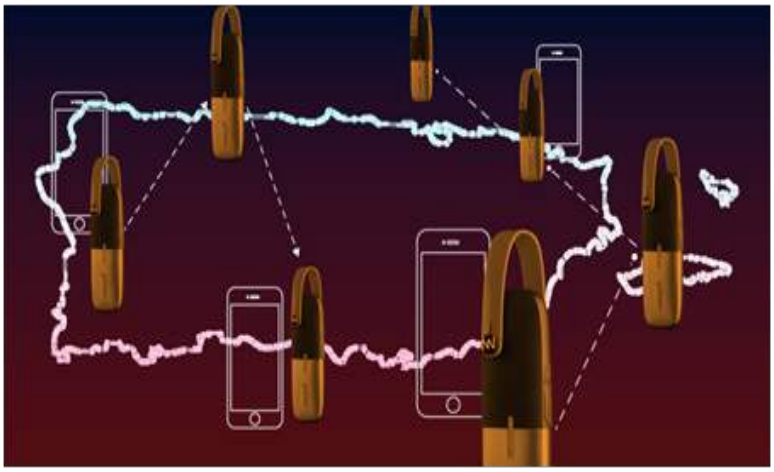
» Lightweight, minimalist design – compact form factor to create an ad-hoc network

» Secure and encrypted messaging – decentralized network, end-to-end encryption of messages

How does GoTenna Mesh work?

Each dongle has a small radio transmitter and receiver that exploits mesh networking over radio frequencies using hop-to-hop delivery. A Mesh network is a local network that connects through a series of nodes relaying messages along a line, which can run for hundreds or even thousands of miles. This essentially makes your smartphone act as a high-tech walkie-talkie! GoTenna Mesh uses Bluetooth Low energy interface for connecting to a smartphone and has a flash memory to store messages intended for you when your phone is not paired to the dongle. GoTenna employs Aspen Grove rout ing protocol, a zero-control-packet approach, utilizing the header information in data packets to build a routing state for relaying future messages.

The range of GoTenna Mesh per se is complicated to gauge; around 4-6km is the nominal point-to-point range. However, the extended range has no specific limits as leveraging its mesh functionality can expand the coverage. Any powered-on GoTenna Mesh can automatically relay messages privately and securely from one user to another.



Whether the relaying device is with a known person, a stranger, or strategically dropped in a convenient place (stationary relay node) away from any people or smartphone, messages are automatically hopped along since the texts can be decrypted only by the end-users. The nature of the terrain, environmental factors, and the number of dongles present around the region affect the overall coverage area. The range can increase with a critical mass of users having more relay devices in the vicinity, creating a crowd-sourced network that permits multi-hop message transfer.

Applications:

GoTenna Mesh is handy in a wide range of scenarios, including camping in the wild and over-crowded festivals that often result in congested cell networks. It could resolve roaming signal issues as well. GoTenna is fundamentally effective for emergency responders since it can provisionally substitute a wrecked cellular infrastructure at an inexpensive cost and even for military forces by enabling secured connectivity at all times.

The company is setting up to host an exclusive open-source mesh platform, Lot 49. This assists a global messaging system without the involvement of any wireless providers. Down the road, it holds real potential on the Internet of Things-type gadgets as well!

Though the range and receptibility are unpredictable at certain instances, for a known local group having the dongle ON, GoTenna mesh is the tipping point in comm tech at an affordable price, providing an ideal solution for challenges faced in off-grid and signal-denied environments. All you need to do is just power on the device and connect it with your phone. Now you can text over miles from the middle of nowhere! Bringing out a clever mesh node from a smartphone is potentially ground-breaking and could eventually spring up a next disruption in the field of communication.

- Divya Seshadri M
4th year, A

THE BOSE AUDIO SUNGLASSES

If there is one thing that no one can live without, it's music. Everyone loves to listen to music, especially on the go. It's the best way to while away one's time and immerse oneself in a different world, and more popularly – to avoid conversation. Headphones/earphones have become a permanent addition to our outfits and Bose has always been at the top of this game. Bose headphones have always been a favourite of the masses and Bose continues to wow us with their products, even more so with their most recent release - the Bose Audio Sunglasses.

The Bose Audio Sunglasses first came out in 2018. In late 2020 they released three new and improved versions – Tenor, Soprano and Tempo. The first two are for fashion, and the third for sports. Each of them comes with polarized lenses that are capable of blocking 99% of UV rays. These new versions have "the tiniest, thinnest, most invisible Bose speakers ever", according to Bose. These sunglasses offer the best of both worlds – they allow one to listen to music while staying aware of one's surroundings. They're a breath of fresh air to those who don't like wearing headphones but still want to listen to music in their own bubble. The glasses are capable of playing music, volume control, accepting/declining calls and accessing voice assistants like Siri or the Google assistant. The glasses could also be prescription ready.

As the Tempo is for sports and the like, Bose lets their customers choose the lens they prefer. The Tempo promises 8 hours of playback while the Tenor and Soprano promise around 5.5 hours of playback. All lenses are scratch and shatter resistant. The frames are available in different colours like rose gold and purple fade for the Soprano and mirror blue and silver for the Tenor. The Tempo has an IPX4 rating for sweat and water resistance while the Tenor and Soprano have IPX2 ratings.

With the Bose Connect app one can easily access the full potential of the Audio Sunglasses and even install software updates to unlock new features like the Press and Turn feature for controlling the volume. So cool, right?

- Nimisha Pabbichetty
3rd year, B

VAONIS STELLINA
THE SMART TELESCOPE

For centuries, telescopes have fascinated us. They have not only been our doors to the unknown, but also our way to explore, discover and contemplate the unseen. Over time, they evolved to help us see further and better.

Following the steps of the telescopes which were invented before, a new astronomical observation instrument was innovated and created to offer new possibilities for everyone. With its iconic design, Stellina - the smart telescope from Vaonis claims its uniqueness in the astronomy landscape with style and elegance. It is a revolutionary design for a revolutionary experience.

WHAT IS STELLINA?

Stellina is a self-contained, portable telescope designed to easily take photographs of the celestial objects. All you need is the Stellina itself and a smartphone. It is not a traditional telescope that lets you explore the universe through an eyepiece. Instead, it captures images with its built-in camera which then could be viewed on your phone (or tablet). When folded, Stellina looks like a retro-futuristic home appliance and one could hardly guess that it is a telescope.

HOW IS THE SMART TELESCOPE DESIGNED?

Stellina uses a 400mm F5 apochromatic lens which is an ED doublet made of Lanthanum glass with nasmyth focus. It has a 1/1.8” CMOS Sony Image sensor with a resolution of 3,096 x 2,080 pixels (6.4 MP) and 14-bit DAC that provides all the three necessary advantages required for astrophotography: high resolution, high sensitivity and high dynamic range. On top of that, the sensor itself has a light pollution or city light suppression (CLS) filter built onto the front.

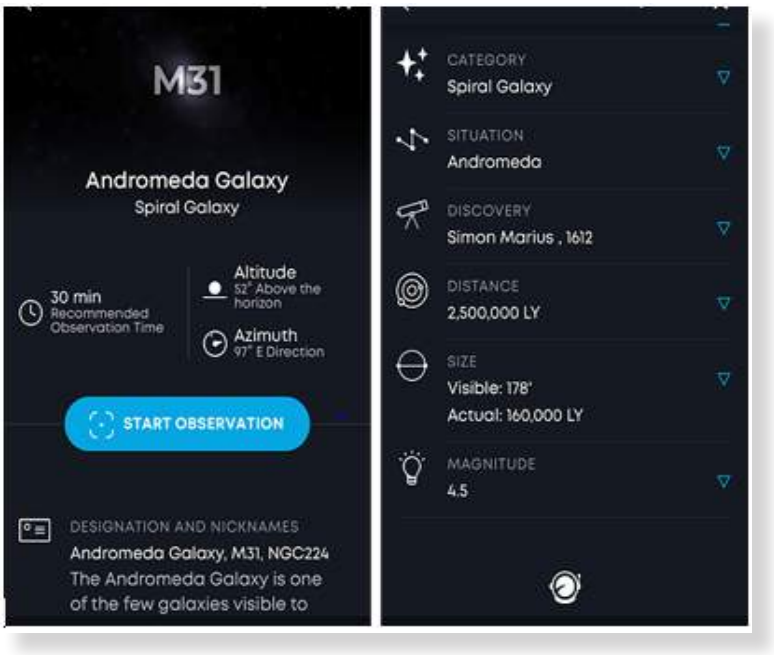
Every astronomer is keenly aware of the issue created by light pollution in the modern age, and this filter solves the issue by combating the excessive encroaching light. The image sensor produces a series of exposures which are then combined into a final image with a Field-of-View (FOV) of 1° x 0.7°.

Its weight of 11 kg (25 lb) makes it portable but its bulky size of 49 x 39 x 13 cm (19 x 15 x 4.7 in) and the lack of handles makes it little difficult to move around. It comes with a Gitzo carbon fibre tripod (1.3 kg, 2.2 lb) which provides levelling and stability to the telescope. It sits on a built-in motorized alt-azimuth mount. It’s IP53 water-resistant and it even has an integrated heater to banish dew.
With 4 motors, 1 heating resistance, 2 temperature and humidity sensors, Stellina has no shortage of on-board equipment. To control all these and offer the best possible images, it includes an on-board computer equipped with a 64-bit quad-core processor clocked at 1.4 GHz, a high-performance graphics processor and 1GB of SDRAM. The telescope requires 5.1V / 2.4A to operate. It can be powered by an external battery connected through a USB Type-C port and stored in a compartment, or by an AC external power adapter. The 10,000-mAh battery that comes along with it provides approximately 5 hours of use. Once powered up, the smart telescope creates its own Wi-Fi network which you use to control it from the Stellinapp (available for both iOS and Android devices).

HOW IS THE IMAGING DONE WITH STELLINA?

This telescope is completely controlled through the sleek and intuitive smartphone application, "Stellinapp". The app is equipped with an extensive catalogue of deep-sky objects, real-time image stacking and processing, and full Go-To functionality. You will get personalized recommendations on what to observe according to your geolocation and the astronomical calendar, and notes about the secrets of the Cosmos. Stellinapp guides you each step of the way on your journey to reach the stars which is all done in a completely automated fashion and in just a matter of minutes. Pretty smart right! Let's see how?

First, switch on the device and let the Stellina wake up. It reads the local time and GPS coordinates off your smartphone. After the automated calibration is completed, Stellinapp offers you a catalogue of astronomical objects that are visible from your location at that particular time. For each of these objects, the app provides you basic information about the object, its current location in the sky (altitude and azimuth), as well as the recommended exposure time.



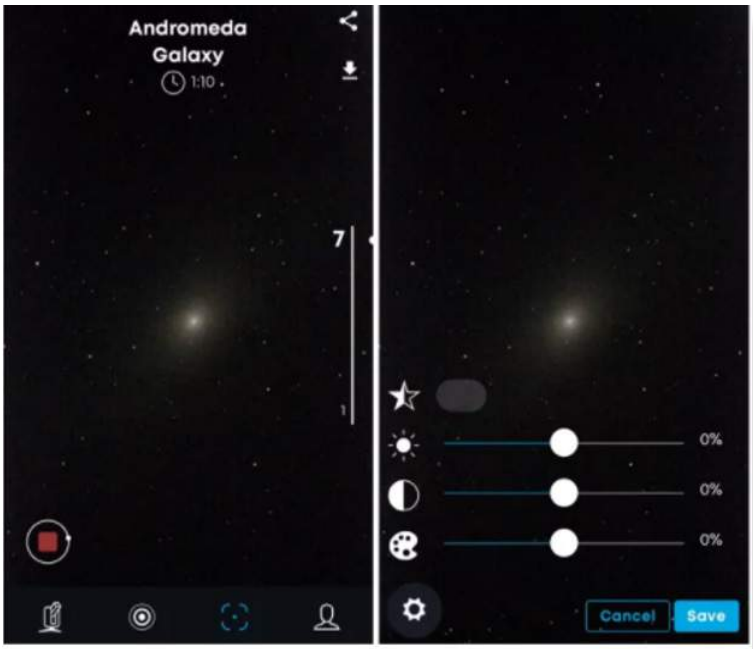
Once the target is selected, the telescope will automatically aim towards the selected area, and track it, to keep it in optimal viewing as the Earth rotates. You only have to wait a few seconds for Stellina to deliver the first image of your destination. It will then stack and process tens, hundreds or thousands of other images in real time, unveiling the details and colours progressively. To do this, the telescope relies on a technique called real time image stacking where a series of relatively short exposures are combined to produce an image with a higher signal-noise ratio.

As more images are exposed and added, you can interactively review how the stacking and image processing improves the final image. Depending on the resolution you wish to achieve for your final image, you have to wait for minutes or for hours. The beauty of the Universe surely deserves your patience!

The finer aspects of the object focussed appear more prominent when more light is gathered inside the telescope and objects can be magnified from 50x to 100x with a digital zoom. Some objects whose angular diameters exceed the Stellina's FOV are excluded from the catalogue. To upgrade the features, Vaonis is planning to extend that list in catalogue when they alter the design of the

Stellina to enhance its ability to combine multiple images in a mosaic. Further, there is also an idea to let the users enter sky coordinates manually for the telescope to point at any direction in the sky. This feature once established would be highly appreciated by the users, since Stellina does not let you manually slew as of now. It is expected that these features should become available through software updates.

You can save the images of the celestial objects you viewed, either on the Stellinapp or on your smartphone's photos app. The images are stored in JPEG, TIFF, FITS (16-bit raw images) formats. The JPEG photos produced by the telescope are down sampled from 6.4 MP to 1.4 MP. So, to enjoy full-resolution images you need to retrieve FITS (Raw) files using the USB port. You can connect up to 20 mobile devices to your station with the multi-user mode, and can also share your photos of the universe in Ultra HD.



An image of Andromeda Galaxy captured by STELLINA

The Stellina from Vaonis is the result when innovation meets automation. It is said that astrophotography could have never been so easy to get into before the invention of this smart telescope. Stellina is a perfect fit for all levels of experience as it is not only simple for children to understand and operate, but also has full capabilities that impresses the seasoned astronomers.

So, explore the universe with ease and in style with STELLINA!!!

- Divya N
4th year, A

SCRIBBLE

An artistic instrument, which makes your world, your pallette

Have you ever wondered what it would be like to draw with a pen that can replicate any colour it touches? One wouldn't have to go through the hassle of mixing colours in different permutations and combinations just to get the right shade, it would make art so much more fun and enjoyable! Well, Scribble promises just that. Read on to know more!

Scribble is the **"World's First Colour Picking Pen"** according to its inventors **Mark Barker and Robert Hoffman**, who launched a fundraising drive to manufacture the tool. Scribble Technology claims that it can scan colour from any object and instantly reproduce the colour on paper or a digital screen. The makers of the Scribble Pen say they wanted to create a tool that **"allows an artist to borrow the colours around them".**

It comes in two versions: The **Scribble Stylus** for paper art,
The **Scribble Ink** for drawing on a digital screen.

Why Scribble?

The Scribble Pen is a concept that set out **to realize the dream of countless designers, artists, and doodlers** who've imagined a drawing tool that can sample any colour and adjust the ink output to match what they need. **"For the colour blind, kids, interior decorators, homeowners, teachers, artists, photographers, designers and students, the Scribble colour picker pen will make copying an exact colour, any colour from any object, an absolute breeze,"** said a spokesperson from Scribble.

It is capable of storing 100,000 unique colours in its internal memory and is also capable of reproducing about 16 million unique colours. The gadget comes from developers based in California and has also speculated that this invention will soon be on the verge of becoming a household gear'.

What's Inside The Scribble: Technical Specifications

The Scribble Pen – a little bigger than a tablet stylus – works by using a 16-bit RGB colour sensor and ARM 9 microprocessor to detect colours upon nearly any surface, then formulates the scanned hue with a matching CMYK ink for output (it's very similar to a mini-sized computerized house paint mixer found at any home improvement or house paint retailer). One gigabyte of internal storage equates to a maximum of 100,000 unique colours in the pen's memory; Scribble+, a partner mobile app can further store and display collected colours for use on a tablet or smartphone.

- RGB Colour sensor
- 1-2 Seconds colour capture time
- Very ACCURATE colour reproduction
- Compatible with PHOTOSHOP
- Advanced Ink management system
- 1GB internal memory
- ARM Processor
- Micro USB charging
- Rechargeable Lithium-ion battery
- Bluetooth Smart (Bluetooth 4.0)
- Lightfast long-lasting Ink
- Capacitive rubber nib & Harder finer tips for the STYLUS
- 3 tip sizes to control stroke weight for Scribble Ink Pen.
- Nib set for the INK pen, 6 tip sizes: 0.3mm, 0.5mm, 1.0mm, 1.5mm, 2.5mm and 3.71mm
- Supports iPhone and Android OS
- Supports PC and MAC

How Does Scribble Works?

It works by making use of a colour sensor and a microprocessor that is capable of detecting colours. Afterward, a mixture is made to create the required ink for drawing by making use of small refillable ink cartridges which are stored inside its body. The Scribble Stylus can also bring the captured colours to the artist's smartphone or tablet using Bluetooth.

RGB Colour Sensor

The built-in colour sensor lets you easily capture any colour - simply point it at an object or surface and press the button! Draw or write with it right away, or save it to sync with your mobile devices.

Multiple Drawing Tips

The Scribble Pen comes with three different sizes of drawing tips, allowing you the freedom to express yourself as neatly or boldly as you like. Scribble is perfect for both drawing and accurate writing.

Refillable Ink Cartridge

Scribble's ink cartridge connects to a smart micro pump that recreates the colour you have scanned.

Perks of Scribble :

- Choose your nib size, Nib set offers a range of stroke weights. From fine to heavy depending

on your mood.

- Scribble pen can scan to a mobile app when you are on the go! Scan and sync any colour instantly from your Scribble Pen or Stylus to any iPhone, iPad, or Android mobile device.
- Program your dream colours via our mobile app. You can add and draw without worrying about what is captured in the pen sensor.
- Scribble pen is compatible with Photoshop/Corel, so you can transfer colour directly from your pen to your computer screen.
- Scribble is both lightfast and water-resistant.
- The pen is small enough to fit into a pocket or small bag.
- A scribble stylus that will pick up colour and transfer it to an app via BlueTooth also lets users match colours for drawing on a smartphone or tablet device or any digital screen.
- The Scribble+ app allows colours to be named, tagged, and organized into sets to make them easier to search for. Stored colours can also be shared with others using Bluetooth.

Cons and Limitations:

- The pen does not scan well when used improperly.
- The weight of the pen can be a drawback in certain use cases.
- The pen is quite expensive for occasional use.

Go Green With Scribble:

One of the most outstanding features of the Scribble is that, since it can reproduce any colour it replaces thousands of marking pens, thereby greatly reducing the huge amount of plastic waste cluttering up our landfills all over the world.

How much does Scribble cost?

The company sells the Scribble Pen and Stylus on its website and at Amazon and Joom. The **Scribble Stylus costs about $99, the Scribble Pen costs about $199, and extra inks cost about $25** (Terms and Conditions Applied*).

Thus, Scribble is a novel piece of technology that can make wonders with colours on both paper and the digital screen.

-Shwathi Ramanathan
2nd Year, B

FLARE CALMER

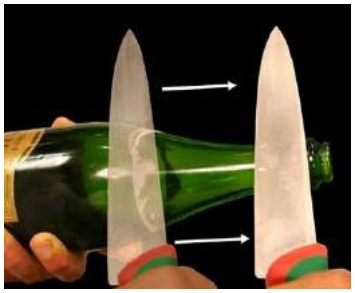
The World Health Organisation published evidence (2018) that unpleasant, loud or disruptive noise contributes to raised stress levels, a multitude of health issues and even increased risk of premature death.

What is CALMER?

What are the most annoying sounds you can think of? Nails scratching down a chalkboard? Car alarms? Loud speakers? Our ears, through thousands of years of evolution, have oriented themselves to find these sounds particularly unpleasant. It serves as a warning that danger is imminent.

While this worked in favour of our ancient ancestors, who listened for prowling sabre-tooth tigers and natural disasters, to us modern humans such sounds are just plain annoying. In fact, according to audio specialists at Flare, the shape of the eardrum itself acts as a bell, adding 20dB of distortion-causing resonance.





Why CALMER?

This irritating distortion could impact our mental and physical wellbeing. The idea behind the Flare Calmer earplugs is that they change the shape of the eardrum to cut out the particularly annoying distorted frequencies between 2,000-8,000 Hz. By doing this, they claim to reduce ear fatigue, noise-induced headaches and overall stress levels.

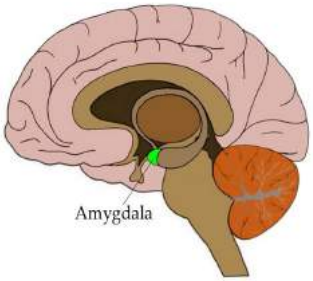
CALMER for sensitive hearing and autism

Calmer helps users with sensitive hearing conditions such as Misophonia, Hypersensitivity and Hyperacusis. Users have found that their audio world becomes more bearable when they wear Calmer, with irritating being reduced to a much more manageable level.
Hyper-sensitivities (over-responsiveness) and hypo-sensitivities (under-responsiveness) to a wide range of stimuli are often things that autistic people have to deal with on a daily basis.These can include sensitivities to sounds, smell, touch and taste. Many autistic people are hyper-sensitive to certain sounds and many find bright lights, smells and tastes overwhelming.

How noise affects us

Researchers from Newcastle University, UK and Wellcome Trust Centre for Neuro-imaging at UCL, UK, reported in the Journal of Neuroscience that when we hear unpleasant sounds, the auditory cortex and the Amygdala interact more intensely and process negative emotions.

The ***amygdala*** is a small almond shaped part of the brain that processes our emotions and aggression. It also controls fear responses and forms emotional memories. Its job is to prioritise everything that comes into your brain – the smells, the sights, the tastes, the sounds, the feelings. There are so many things in our lives that we can't handle being aware of all of them. Some are ignored to focus on others.



Workplace noise

A survey of 1,000 UK-based office workers at a business solutions company, The Remark Group found that almost two thirds of workers admitted that they could not complete work on time because of noise in their workplace. Nearly half said that noise had a negative impact on their overall wellbeing, while more than 40% admitted that noise at work caused them to feel stressed.

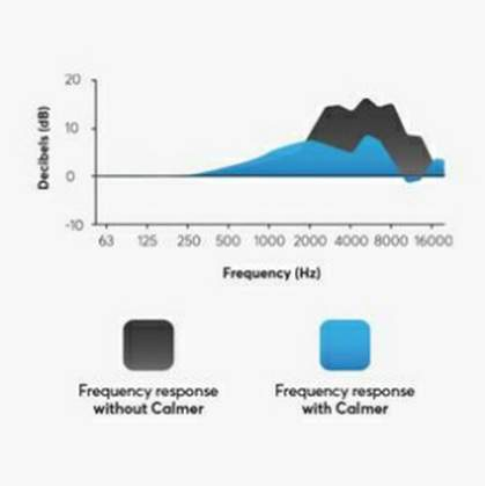
According to the survey, sudden bursts of noise are the most irritating in the workplace, with the most annoying being: colleagues' telephone conversations (74%); personal conversations (65%); sudden laughter (62%); telephone ringtones (58%); doors slamming (56%); eating noises (55%); business conversations (53%); coughing/sneezing/sniffing (50%) and music (40%).

CALMER's technology

Calmer's technology is informed by research from Newcastle University and the Wellcome Trust Centre for Neuro-imaging at UCL, which reported in the Journal of Neuroscience that many of the most unpleasant sounds, such as the scraping of a knife against a bottle, fall in the mid frequency range of about 2kHz to 5 kHz.

How does it work(technically)

Here's a graph to show you how Calmer is affecting sound energy in our ears. As you can see, the blue area shows a reduction in unwanted energy (distortion) between the frequencies of roughly 2 kHz - 8 kHz when Calmer is worn. As a result, this produces a much more even response and therefore an improved and more pleasant sound.



The black area (without Calmer) shows the natural peaks of energy that result in harsh noises that trigger a stress response.
As these trigger frequencies are reduced, so are your stress levels.

Calmer removes the resonant effect of the concha by using a tiny waveguide inside our ears. The concha is the small shell shaped hollow that connects to our ear canal which normally resonates mid frequency sounds.
By removing this resonance, mid frequency sounds have none of their normal painful aspects.

"We conducted a range of tests on Calmer and found it to significantly reduce sound levels at middle to high frequencies (2 kHz – 8 kHz). This successfully meets Flare's design objective."

Gergely Orosz, ISVR Consulting

How does noise trigger a stress response?

Our ears have evolved to alert us to stress by adding over 20 dB of mid-range resonance, which destroys our ability to hear high-definition sound or relax in our modern noisy world. This is known as HRTF (Head Related Transfer Function).

Noise triggers a stress response in the amygdala, a region of the brainstem. Our amygdala learns what sounds might signal impending danger. When one of these sounds is detected, the amygdala releases cortisol (a stress hormone).
This distorted sound loads us negatively. Much like poor diet, pollutants, distorted vision, which all affect our well-being, the sound we hear has the same effect.

Side Effects

Flare reduces the constant ringing in the ear experienced by those suffering from tinnitus.

- Vinu Abinayaa R
2nd year, B

WRITER'S ENCLAVE

UNLIMITED POWER!

There are not many movies that have a significant cultural impact like that of Star Wars. It easily has the most diverse fan base, which spans across the age spectrum. Some are there for the music, some for the legends and plot, and all secretly for Carrie Fisher in the OT. Undoubtedly, it has the most passionate fandom. I mean, they resurrected an alien with under 6 minutes of on-screen time just for his cool tattoo and double-sided weapon with delayed ignitions (If you haven't caught up yet, Spoiler alert?) Nevertheless, when an entire era is 75% memes, IT IS ONLY NATURAL for one to miss out on the larger perspective.

The entire saga is about the conflict of ideals, the conflict of beliefs, or simply put, the Duel of the Fates (and the importance of Mental Health, for sure) (Just try naming one character without mental burden).

However, the Sith offer us something crucial about everyday life.

The Sith (and the Jedi too) have their own code of conduct.

Here's the Sith Code:
Peace is a lie. There is only passion.
Through passion, I gain strength.
Through strength, I gain power.
Through power, I gain victory.
Through victory, my chains are broken.
The Force shall free me.

And here's the Jedi Code:
There is no emotion, there is peace.
There is no ignorance, there is knowledge.
There is no passion, there is serenity.
There is no chaos, there is harmony.
There is no death, there is the Force.

It is clear that both the factions desire the same goal—liberation, and fascinatingly, neither of them promote being a wizard in the middle of a desert nor being a mentally crippled cyborg with a lust for choking literally everyone over the lack of faith.

First off, why does one need a code of living? Truth be told, we secretly, without awareness, live by a code imposed on us, usually dictated by religion. While they still exist, something just feels wrong, at least on a personal scale, mainly because they are elaborate and difficult to follow and made by someone who lived in a completely different world.

That being said, I believe the Sith Code is practical even in everyday life, especially for someone walking along a dark path.

The Sith Code starts with *"Peace is a lie."*

That honestly is just a mockery of the Jedi code, so I'll skip this. They've been at ends, after all. From here, we jump into a bit of Philosophy.

"There is only passion."

Yes, without a driving force called passion, it is impossible to do practically anything, not even attend online classes, for that matter. A life without passion is a life without substance. We live by making bonds with people and places. Life, in general, is never devoid of passion – we always secretly root for something. Life is in constant flux comprised of love, betrayals, pain, happiness, victory, and defeat. Passion drives it all.

"Through passion, I gain strength."

One of the most important lessons of Star Wars is that you must feed on passion. Life is short, and it is through passion we learn, connect and grow. We're often knocked out of our paths and yet, through passion, we fight back to get back on track.

"Through strength, I gain power."

When we find strengths in the fields we are passionate about, we have a solid understanding of how things work. Power stems from the freedom to choose, and when you have the knowledge of self and the world around, power is limitless. On the other hand, having such power without knowledge is a highway to hell and destruction

"Through power I gain victory"

This depends on the individual. To me, Victory is the ability to channelise my thoughts irrespective of how I feel and using my strengths for the benefit of my own and those around me.
To reach this self-defined goal, the first step is to master my own thoughts, turn my fears into motivation, and learn my limitations to master them.

Honestly, you can say that the Sith code is from “Thus Spoke Zarathustra” and get away with it. For those who don’t know, it is the philosophical magnum opus of Friedrich Nietzsche (Pronounced Neet-chuh, but I prefer using Neet-Chay just for the sheer amount of puns and dad jokes that come along)

“Through victory, my chains are broken.”

Chains here is definitely metaphorical. Most of the time, we are bound by obligations, and it is only through victory, we are free of them. Also, this highlights the core ideology of the Sith – Never be satisfied with what’s there in hand, never let the passion burn down, never forget the hunger for knowledge, for there isn’t just one chain to break.

“The force shall free me.”

Again, we leave the philosophical realm here and jump back to fantasy and amazing lightsaber duels with brilliant background scores, right from the first movie to the last. One can say this code is too selfish, but I beg to differ. It just enforces the idea of not expecting to be helped but never encourages the idea of not helping.

While there are both religious works and philosophical paths which dictate the exact same thing, it honestly hits easier when delivered through well-written movies and games when compared to reading books that always have an endless list of prerequisites.

I have Spoken.

- Aadhish S
2nd year, A

The Raagas and Rasas of Nosh

The tak-taka-tak of the tavetha, Nngs of the knife whilst fencing with the cutting board, the cooker's coos, the blunt-ended spatula's shruti, and laya organization as they drive the mashed vegetables against the big belly of the metallic Kadai, and the vroom of the grinder.

Some pretty vibes when you get to follow the scents your nostrils have caught onto, with all the pathways leading to a culinary locale- the grandiloquent Indian Kitchen.
The rice that settled itself comfortably into the vessel filled with enough water to wake it up from its forty winks, giggled at the bowl of bitter gourds seated on the other side of the table. 'Is there something funny, Mr. Rice?'. 'No offense, but I still struggle to comprehend how the owner of this house brings you here despite knowing that at the end, you've gotta find a way out of the trash can.'
The bitter gourd was horrified at the declaration, as Mr. Rice added, 'First time, Eh?'
Mum had requested me, no, bossed me around to wash them well before proceeding on my way to murder the poor soul. I felt bad for him too, except I knew full well that bitter gourd never belonged with roti.

And neither did the Alternanthera sessilis (I understand, no Greek, but not sure what to call it, some spinach variety) that sat near me, as if in a spa trance.
As I finish cutting the naïve bitter gourds that had a strange fate awaiting from the hands of my brother, I give an earful to the onions chatting by, boasting how they forced me to cry several times last night. Enraged, I pick the obstreperous one from the basket and gouge him out with the sharp knife.

The tomatoes twattle around, cross-examining the DNA results of the cauliflower and cabbage inside the air-conditioned interiors of Whirlpool. 'God, you look strikingly different from him, and yet ye boast ye self to be his cousin. What are you getting at, man?', a tiny tomato tot squeaked.

The capsicum offered a hearty laugh, joining the catastrophe waiting to break out. 'Not sure how, but see the red and yellow-red peppers snoozing out there?'. The chillies and the eggplants follow suit. 'What if I told you that they aren't the same as me, that we are two contradictorily different species?'
The mouth of the banana flower snapped open (the one my father arranged to go prom with fried rice on the morn that follows) as collective gasps from the cooler machine followed suit.

I smile ear to ear, with their raagas putting my heart at ease and sanguinity despite the calefaction urging me to snap. I pick a few chirpy tomatoes and breezy capsicums from the lot that strike back at my sudden reactions.

Just the way how the concepts of pitches, notes, and scales can be translated to the Shruti, Swara, and Raga, these foodstuffs seemed to have a lesson of their own. The bitter, and under tasting foods that prick our tongues (Unfortunately, the healthiest ones fall into this category) take up a one, the rank of the lower-pitched shadjamam, and the ones that make your eyes pop out in relish, in overflowing taste and favouritism, course the ones with the 'hard to play and remove' carbs plus glutens, take up the maximum rank it can get, the glory of the higher-pitched shadjamam.

It's an enigma as in on why we make ourselves hate the bland former, and grow up to love the trickster of a latter.The funny choices we make, I chuckle under my breathe.

Finishing my job, as I walk outside, to inhale the fresh air at abendrot, my eyes take in plates and bowls of foodstuff swimming happily in the drain. They jump with spirits as they spot a malnourished cow and its calf giving them the recognition they lost from the house they escaped from.
With my legs carrying on, minutes later, I find myself crossing a marriage hall. My neck cranes sideway to find the huge bin overflowing with more food. The remnants of pudina rice, and avial wave a hi my side, peering down from the edges of the box. Their eyes light up in a flash, and as I turn around, I lose myself to the slum children racing towards it, collecting them in their polythene covers.

As I stand there, the plantation bends its head and whispers into my ears, 'These are the rasas of the ragas someone left behind. They discarded those rasas feeling it didn't belong in their tongues, but for a moment, they forgot that the same rasa could fill someone else's stomachs'
I hang my head in shame, just in time to see another man dropping his plate untouched.
Literate by the clothes we wore, illiterate by the minds we donned.
'Just a plate.' Yes, just a plate, my dears. But it's more than a breadbasket for the ones who lie in between.

The teardrops meet the ground to quench Gaia's thirst, the same moment her children's mouths find the taps.
The wasted rasas of splendiferous ragas, all of the nosh, What a world!

Footnotes: rasas- tastes; nosh- food.

- Balambal S
2nd year, A

Importance of Financial Literacy for Women

On the occasion of International Women's Day, Paytm, an Indian e-commerce payment system and financial technology company conducted a social experiment. They brought in 30 adults and made them stand in the same straight line. The game was simple- they'd be asked a bunch of questions, and if the answer to a question was a 'yes', they could take a step forward and a step backward if otherwise. The questions were quite vague and random at first-"Did you learn how to ride a bicycle before the age of 10?" or " Did you learn music at school?" but soon progressed drastically-" Do you know how to purchase insurance without assistance?" and " Do you know the difference between a SIP and a Mutual Fund?". After all the questions were done, all the men in the group were standing way ahead of the line they started at and the women way behind it.

The gap between men and women when it comes to financial literacy is evident. The reasons behind this, though, are vast topics of discussion and deliberation in themselves. However, the takeaway point is that financial planning for women is a critical aspect for them to reach their personal and professional objectives without being dependent on anyone. Learning about personal finance gives you the knowledge and understanding to make smart money choices. Thus, you become more in control of your own life and are empowered to do the things that matter most to you. The key is to start. Start looking up personal finance online, start a Demat account, start investing small amounts but try to do all of this on your own. Seek assistance as a beginner, certainly, but ensure that it is you who manages it after that. As they say- Financial independence is a woman's ultimate empowerment.

Here's to financially independent women- may we know them, may we be them, and may we raise them.

-V Rangashri
2nd year, B

WHAT WILL TECH LOOK LIKE IN 2050?

Households having live-in ape helpers and flying houses that can teleport are just some of the hilariously outrageous predictions made by people decades ago about the year 2020. While we still do not have the flying cars or floating cities futurists of the 60s wanted, we have far more powerful and influential technologies that developed so rapidly that even people from as recent as the 90s never saw them coming. The potential for developing techs like Artificial Intelligence, Neural networks, and Blockchain is enormous, and the future looks exciting and full of opportunity.

While trying to foretell the future is a hit-or-miss (more latter than the former), we might be more well equipped than our counterparts from half a century ago to try and visualize what the year 2050 might look like. The future of AI is one of the most anticipated aspects of the coming years. The momentum behind AI research is at an all-time high, and with the ever-increasing amount of data that can be gathered, the applications are endless. AI-assisted tools will not only take over the lifestyle of an individual but also enter every field of critical human work, from mining to handling radioactive waste. AI-based self-driving vehicles are predicted to be in everyday use by 2050, and cybersecurity, with the help of AI algorithms, will reach high levels of protection from cyber-attacks ranging from cross-country data breaches to small-scale identity theft. AI is also predicted to drive a medical revolution that can help track patients' lifestyle and genome to detect brain tumors, help map cancer treatments, etc.

Employment, jobs, and workplaces will be completely different from today, with the work environment being a combination of people, bots, and machines completely regulated by AI. While more than half the jobs existing today will become obsolete, new jobs will also be generated as technology becomes more and more complex. Some experts believe that by 2050, with the help of nanotechnology, it is possible to link human brains to a simulated world with the ability to be immersed in hyper-reality.

By 2050, scientists predict that near 100% renewable energy can be achieved with solar, wind, and hydro energy, and dependence on fossil fuels will likely fall to less than 40%, thus completely transforming global power systems, regulation, and policy. Another exciting development is the possibility of space tourism. With companies like Tesla and SpaceX breaking barriers in space technology, it is speculated that space tourism, albeit for the very wealthy, will be common. More enthusiastic predictions say that commercial firms will control the Lower Earth Orbit and small settlements will populate the moon, with a possibility of space power generation.

A lot of the ideas about what 30 years from now may sound at the very least unlikely and at the most absurd. But it is important to remember that even the smartphone and the internet would seem like outlandish ideas to people from 30-40 years ago and what sounds like science fiction today might very well be the reality tomorrow. With an open mind and cautious optimism, we can look forward to a future that promises a better world and a better life.

- R SAMYUKTHA
2ND YEAR, B

THE DECIMATION OF DOSA

Think about it, how many memories do we have connected to this one staple dish? Entire South Indian households will cease to function without the existence of dosa, and that is no exaggeration. Dosa / Dosai is one among the most commonly relished cuisines in south India and has multiple variants to enrich its plain taste. A dosa is so versatile that even a mediocre dosa can be compensated by extraordinary chutney AND sambar (It is always “and”; “or” was never an option)

But, where did it come from? Who takes credit for it? Who made it popular? Who messed it up by deciding to add szechwan noodles to it? (That final dude/dudette earned his/her place in the bottom-most tier of hell, for heaven’s sake) It might disappoint the reader from here, if it hasn’t already, so proceed with discretion?

TLDR, The idea of dosa is ancient, at least as old as the third Sangam. It is no surprise the southern part of India has been using multiple types of millets and rice for ages. A dish, perhaps rice based, which is shallow fried in a pan is mentioned in Tamil Sangam literature.

A dish named Appam is mentioned in the Tamil work named Perumpanuru, which was composed around the 3rd century AD. It was a dish baked on a concave circular clay vessel / chetti and soaked in milk for consumption. This dish was considered a luxury. The Mathuraikkanchi, a work from the Sangam Era also mentions Appam and Adai, which is a dish similar to dosa and made of lentils and rice. In short, all these works mention a thick and soft dish based on rice.

King Someshwara, third of his name who reigned from AD 1126 to 1138 attributed to the Sanskrit work Abhilashitarthachintamani, better known by the easily readable and less daunting title Manasollasa, which means “refresher of the mind”. It is divided into 4 parts and dictates how kings must live, how many palaces they are supposed to have (Spoiler alert: One for every Season) and this work definitely has a dedicated section on food. It mentions a dish named dhosaka/dhosika. Dhosika was a dish made from a paste of ground lentil / urad dal, black eyed peas and flavoured with asafoetida, cumin, salt and ginger, and cooked in a lightly oiled hot pan. The main difference between this and the dish in Tamil Nadu is that dhosika is made from pulses and not rice. This dish was also thin and crispy unlike its counterpart. It is suggested that rice was added to the recipe much later, thus leading to the contemporary dosa. It is believed that doshaka is the Sanskritized word for dosai.

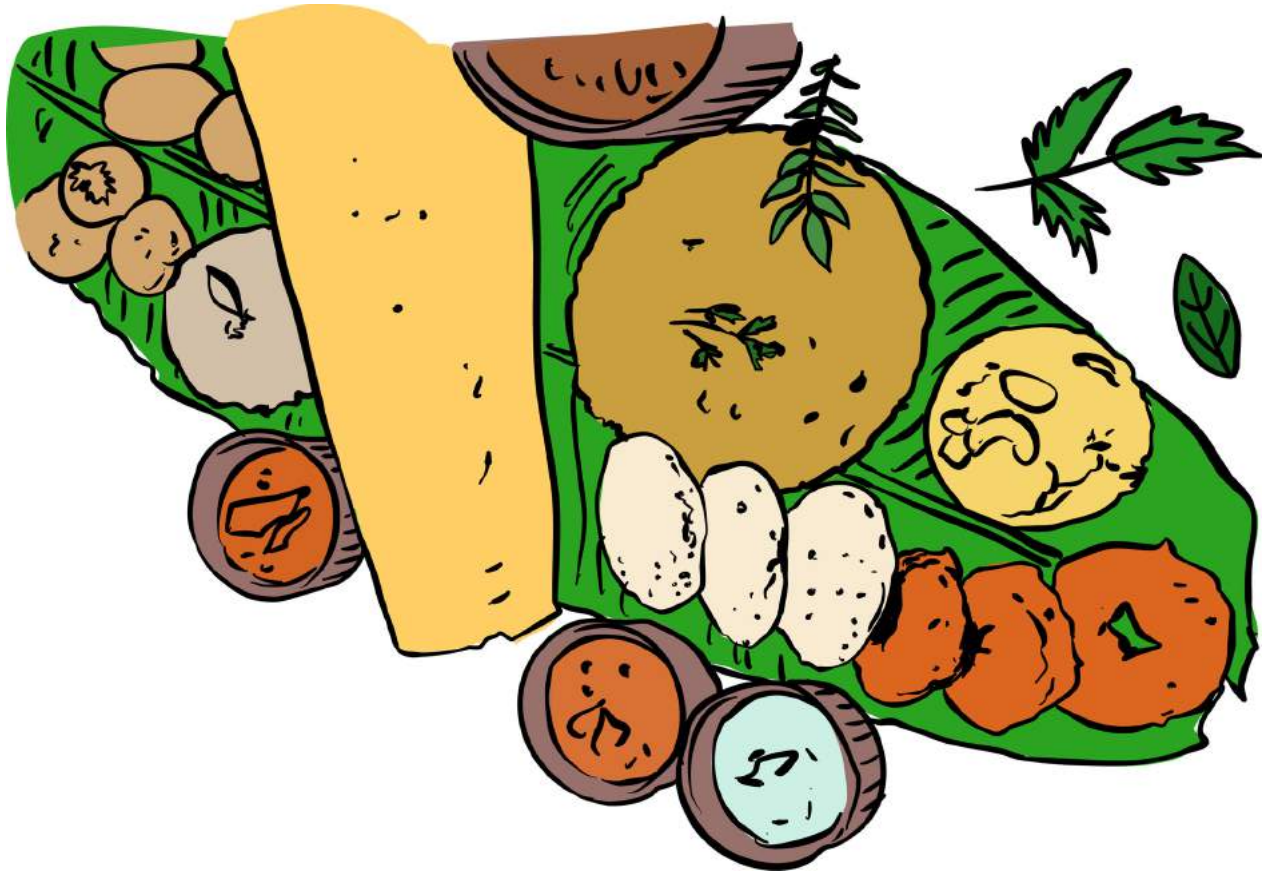
We also find a similar Telugu dish named attu/atlu. Infact, in the Telugu Festival – Atla Tadde, which is the Telugu equivalent of Karva Chauth, the fast is broken by consuming atlu. The poet Srinatha Kavi, in his work named Shrungara Naishadam mentions a dish named capatlu, a dish similar to dosa.

All this hint at the same thing, the dish has been relished and consumed since a time unknown to literature.

Food historians credit the modern dosa to Udipi, as it is believed that the cooks and chefs of Udipi spread the recipe across India and introduced it to the cuisines of many other states. With the introduction of potatoes to Indian Cuisine, we perfected the Masala Dosa, which is sometimes dubbed as the gateway to South Indian food. Thanks to restaurant chains, the fame of dosa has reached many countries.

Enough about dosai. Let's wrap this up with a (not so) fun fact about the close cousin, idly. Do you know how Rava Idly was popularised? You have to, because you're totally going to score a breakfast/lunch/dinner date having south Indian food where you're going to talk about the history of what's on your date's plate. During WW2, Mavalli Tiffin Rooms, commonly known by the name MTR, started experimenting with Semolina for idly as rice ran into shortage. Soon, this dish named Rava Idly gained many lovers and that's why MTR's Rava Idly is still famous. Now you can flex with this unsolicited information, and hopefully not get ghosted. Time for some dosa and Filter Coffee.

- Aadhish S
2nd year, A



ECLIPSE

The shadow of self-doubt
obscured the light at the end of the tunnel.
The intimidating dark oblivion
made me huddle deeper into my mind.

Unasked questions and eluded answers
closing in on me.
Mentally claustrophobic,
physically imperceptible.

Suddenly everything seemed superficial.
All of it a flawless fabrication.
How long have I been lying to myself?
A hollowing feeling of betrayal.

Struggling to break free from a virtual cage.
Rattling invisible chains of loathe.
Frustrating frustration
when I realize how futile my frustration is.

It is darkest before dawn.
The eclipse finally comes to an end
as I acknowledge the insurmountable.
I emerged victorious as I let the darkness win.

Music is, after all,
bound by seven notes.
Life is, perhaps,
a beautiful cage, after all.

A hint of guilt as I recover.
Is it not wrong to be oblivious?
But isn't ignorance bliss?
The contradictions gnaw at me.

Sometimes, for the sake of our sanity,
we must be selfish.
It's okay to lie of sunshine and rainbows
than to mull over the harsh truths of life.

- Aishwarya Ponni P
3rd year, A

A BETTER WAY TO GET THINGS DONE

If 2020 taught us anything, it is that flexibility is crucial. Of course, there is a significant privilege in having the time and ability to choose to make a life shift right now, when many people are facing changes they most certainly did not ask for: no emigration, losses of jobs, savings, homes, friends, family, security.

We all would have gone through some phase wherein we were forced to implement a change in our plans due to the novel coronavirus. We would've even heard instances since the outset of the pandemic, that more than 70 percent of youth who study or combine study with work have been adversely affected by the closing of schools, universities, and training centres. This was a report according to an analysis by the International Labour Organization (ILO).
"The pandemic is inflicting multiple shocks on young people. It is not only destroying their jobs and employment prospects but also disrupting their education and training and having a serious impact on their mental well-being. We cannot let this happen," said ILO Director-General Guy Ryder.

Most of our minds would be in a state of conflict – 'What do I do after graduation?' 'Has the world settled?' 'Should I go abroad for a Masters degree?' 'Should I stay back and then try again after a few years?' 'Should I let go of my dreams?' 'Should I stop thinking about everything?'
Oh, wait! There might be light at the end of the tunnel. It might be surprising to note that some of our plans would be achievable only if we were spontaneous.
Imagine yourself sitting for an interview and your interviewer asks you about a situation where you have made a quick decision. Well, you try to give an answer where you reflect upon a past situation, describe an assigned task, explain the action you took, and conclude with an analysis of the result of your action. The outcome might not be the thing you would've expected. Spontaneity always comes from within.

Career planning is important, but there are a lot of other things to really know what the future will hold. If you plan a career from the bottom up, it's impossible to imagine the unexpected avenues life will take you down. Knowing what's coming next isn't always a blessing either. It was always clear we were going to have a third lockdown, but this didn't help in planning what came next: it just added anxiety.

Why not seize the pleasure at once? – How often is happiness destroyed by preparation, foolish preparation! – Jane Austen

Being spontaneous and breaking the norms of everyday routines allows life to be more enjoyable and less rigid. Sometimes it's healthy to just let loose and do things that you wouldn't normally do. It means letting go of your fear of rejection, fear of change, fear of failure, fear of making mistakes, fear of embarrassment, and fear of criticism. It means letting go of all the fears that are currently holding you back from living your life fully. Like any good quality or reflex, spontaneity has to be practiced before it can truly become useful. There are lots of variables in our everyday life that we can't control. Though we won't be able to give up control of these unknowns, learning to be a little more flexible can help our outlook. That's where being spontaneous can help us. It conditions us to relax.

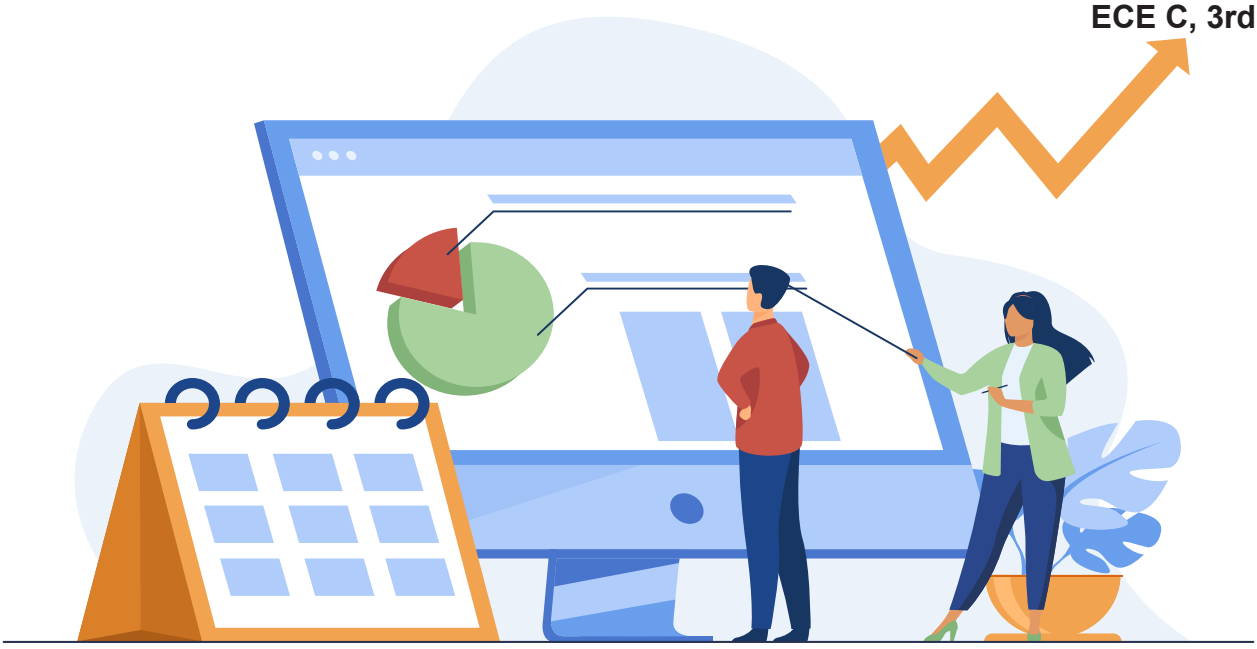
Having seen this, we can conclude that being spontaneous mostly comes down to saying one simple word. And that word is YES! We can also try practicing this as this makes us flexible and gives us the courage to face any situation in life.

Let's try to change a little bit and think more before making a decision. Say YES to challenging problems and embrace them fully. Whether you fail or succeed doesn't really matter. What is important is that you learn, grow and enjoy the process. Say YES to intuitive hunches, to creative ideas, and to crazy inclinations. Try to go with the flow of life. This doesn't mean that you're careless. It is way far from it. You would've had so many varied life experiences that made you aware of the risks and dangers. There are endless options for your future. Potentially, the best part about winging it is never having a planned end to your journey. There's no right or wrong answer to your future once you accept the unknown. You're now free to move anywhere you've wanted to live; try things you've wanted to experience and meet people you would've never crossed paths with. You need to go after what you love without any regard for the "what ifs" because it's the "ifs" that make us cautious. At times, we can understand for ourselves that when we feel too comfortable, we've probably been saying NO too often. That's when we commit themselves to breaking that cycle by making an effort to step outside their comfort zone. It is also important to understand the value of saying NO. It is good to say NO when we take the opportunity's cost into consideration. While we jump first and try to grab an opportunity when it presents itself, it is also important to take a long-term view and quickly assess the impact that our decision will have in the long run. We should have long-term fulfilment as our highest priority.

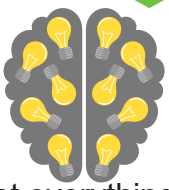
Our fears have the greatest hold over us whenever we resist them. Whenever you freeze and choose not to confront your fears head-on, that is when you give your fears the power and control, they need to influence your decisions and behaviour. Let's try to step out of our comfort zones and confront our fears by taking a single step at a time. Let's live life to the fullest and enjoy every moment of it. Every decision to act is an intuitive one. The challenge is to migrate from hoping it's the right choice to trusting it's the right choice

Inspired by Getting Things Done-The Art of Stress-Free Productivity by David Bell

- Rashmika B
ECE C, 3rd year



ENGINEERING THE FUTURE



Let's face it: engineers are bad at making predictions. There have been many panel discussions across the world on the future of technology, but I'm not sure they got everything comprehensively right. Anybody who looks back on the technological progress the world has seen should feel overwhelmed and surprised, simply because no one ever talked about the technological prowess that the modern world wields. No one ever said that the internet would start ruling our lives, no one ever said that you could stop using cash physically and instead commit to online transactions, no one ever said that we would have computers in our pockets wherever we went or even robots that would Mars for possibility of life.

Many people felt a long time back that the best way to predict the future was to invent it. And the problem was that they spent too much trying to make it happen without taking cognizance of the ripple effect of inventions and technology. The truth is that the world evolves in an extremely complex way, and at any point in time, there is no fixed path. Great inventions may never see the light of day, but simpler innovations may hold sway over the public.

Robert W.Lucky, a former scientist at Bell Labs, draws attention to this. In the famed Bell labs, at one point of time, there were two great development projects in vogue to shape the future-the Picturephone and the millimeter waveguide. However, these ideas never made it to the end of the tunnel. Many people used to say that the future of communication was video conferencing, but even though it is seemingly ubiquitous today, not many people want to use it.

Most technologists knew in its early days that the internet would grow at an exponential rate, but never knew that it would grow up to be a huge commercial network in itself. Some of the finest engineers in the previous century were ignorant of the exponential trends at that time, and instead focused their energies on other, seemingly glorious "big technologies".

The problem with this approach is that there is not enough done to enhance existing technological trends at a time at which they are in vogue. Engineers end up looking too far ahead, and thus existing technologies do not receive the attention and time required to develop them into marketable products to the public. This is exactly why it takes a very long time for technologies to move from the labs to the markets.

Moreover, this is a vicious cycle. In this manner, every innovation will take a long time to make it to the hands of the public. At the same time, there will be distortions due to multiple push and pull effects of other technological products. To break this cycle, it is necessary to take a pragmatic view towards technology. Any technology can be developed only by a brick-by-brick approach. There are so many wonderful trends today that are waiting to materialize. It is important not to get deluded by the promises of future technologies still in the incubation stage. And it is imperative to invest more in current technological trends than in future ones. Who knows, these existing trends themselves may lead to the future, which is a possibility we have not yet explored.

- Rangasubramanian K
ECE B, 3rd year