The Department of
Electronics and Communication Engineering

PRESENTS

Impulse

EDITOR'S NOTE

Hello Readers!

With immense pleasure, we bring to you yet another successful edition of Impulse Magazine, on behalf of the department of ECE!

This edition has truly been a delight to work on, and as editors, it has been our pleasure and privilege to collaborate with so many brilliant and enthusiastic minds from all across the ECE student body. The determination, creativity and resourcefulness that was displayed by the writing and design team is a testament to the spirit of collaboration and community that we have always aimed to foster and build here at Impulse. In this edition, we present to you a wealth of knowledge, interesting research and thoughtful discourse on all that is exciting in the world of ECE. Our team has also put in great efforts to bring to you an exciting glimpse into the world of placements, which we hope will help you decode and navigate the much-anticipated but feared process. Most of all, this edition is a foray into the numerous exciting activities undertaken by both faculty as well as the students of our department and we are honored to document them and present them to you.

We would like to congratulate the writers for creating such informative and well-researched articles and the designers for aesthetically and intelligently presenting such vast content with beautiful layouts and designs. We would like to sincerely thank our HOD Dr. P. Vijayalakshmi ma'am and the department of ECE for giving us an opportunity to bring this magazine to life. We also extend our gratitude to our faculty-in-charge, Dr. Gulam Nabi Alsath without whose mentorship and guidance, this edition wouldn't have come to fruition. We hope you enjoy reading Impulse as much as we did creating it!
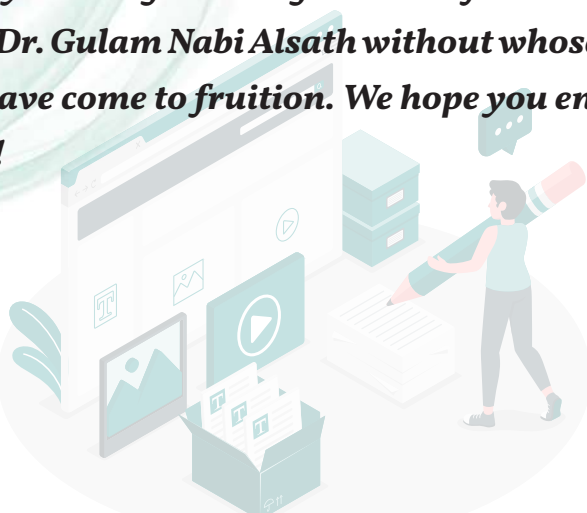
R Samyuktha, IVth, ECE B
Rangashri V, IVth, ECE B
Kruthi R, IVth, ECE A
Anusharaj S, IIIrd, ECE A
Shrinidhi Seenivasan, IIIrd, ECE B

MEET THE TEAM

FACULTY CO-ORDINATOR :

1. Dr. P. Vijayalakshmi
   Prof. & HOD, ECE

FACULTY INCHARGE :

1. Dr. M. Gulam Nabi Alsath
   Associate Professor, ECE

EDITORS :

1. Rangashri V, IVth, ECE B
2. Samyuktha R, IVth, ECE B

SUB-EDITORS :

1. Kruthi R, IVth, ECE A
2. Anusharaj S, IIIrd, ECE A
3. Shrindhi Seenivasan,
   IIIrd, ECE B

CONTENT WRITERS :

1. Abiisek M, IVth, ECE A
2. Aditi Kannan, IIIrd, ECE A
3. Harini A, IIIrd, ECE A
4. Lakshana D.K, IInd, ECE A
5. Manushresth M, IInd, ECE A
6. Nethra Prakash K, IVth, ECE B
7. Nivetha Elango, IIIrd, ECE B
8. Shanmukha Priya, IIIrd, ECE B
9. Sriya Pavani, IInd, ECE B
10. Tarun V, IInd, ECE B

DESIGN HEADS :

1. Gayathri S, IVth, ECE A
2. Krishi V, IVth, ECE A

DESIGNERS :

1. Dhivyaharshini R, IIIrd, ECE A
2. Harshini,IInd, ECE A
3. Iniyavai Kooral A, IInd, ECE A
4. Jeevaharini K B, IInd, ECE A
5. Krisha Aarunee, IIIrd, ECE A
6. Lakshana D.K, IInd, ECE A
7. Maria Gladhina, IIIrd, ECE A
8. Medha D, IInd, ECE A
9. Sanjay B, IInd, ECE B
10. Shree Varshini, IIIrd, ECE B
11. Shri Dharshini S, IInd, ECE B
12. Shriya, IInd, ECE B
13. Sivaranjani S, IInd, ECE B

CONTENTS

VISITS AND INTERACTIONS

- ▶ Dr. S. Radha, VP/SSNCE, Dr. M. Gulam Nabi Alsath, Dr. S. Esther Florence, Dr. S. Ramprabhu, Dr. B. S. Sreeja and Dr. S. Kirubaveni, ASPs, were involved in a discussion with a team of experts from Valeo & HCL technologies for possible technical collaboration during June 2022. Followed by this, Dr. P. Vijayalakshmi, Prof & Head, along with other members above attended the MoU signing meeting between Valeo and SSN Institutions on 03.08.2022.

- ▶ Dr. P. Vijayalakshmi, Prof & Head, Ms. K. Mrinalini, RS, had a discussion with the HCL team about a project on speech-to-speech translation system.

- ▶ Dr. M. Gulam Nabi Alsath, ASP, and his research team participated in the weekly review meeting with BigCAT Wireless Pvt Ltd to discuss the progress made in the ongoing funded project on "Ku Band Reflectarray Antenna" during June – November 2022. As part of the project, the BigCAT team visited the RF and Microwave Testing Lab during October 2022.

- ▶ Dr. N. Prabagarane, ASP, & Mr. Varun V. Krishnan Director Engineering, Flatirons Solutions had a discussion on the final draft of the MoU to be signed between Flatrions Solutions and SSNCE on 25.06.2022.

- ▶ Dr. S. Sakthivel Murugan, ASP, visited NIOT on 19.07.2022 and discussed with Dr. Tata Sudhakar, Scientist G & Head, Ocean Electronics regarding various projects in underwater signal processing and animal bioacoustics.

- ▶ Dr. S. Sakthivel Murugan, ASP, discussed with Dr. Tune Usha, Scientist F, NCCR (National centre for Coastal Research), Chennai regarding joint underwater data collection along coastal region of Bay of Bengal and possible MoU with SSN on 19.07.2022.

- ▶ Dr. K. T. Selvan, Prof, visited LRDE Bengaluru to discuss the progress of the ongoing project and to explore future collaboration prospects on 29.07.2022. He was accompanied by Senior Research Fellow Ms. M. Akila, RS, and Research Assistants-cum-UG students P. Baskaran and R. Yashwanth (UG-ECE 2019-2023 Batch).

- ▶ A team of Ford India limited visited the Department of ECE on 05.08.2022. The team visited various research labs. Further, possible research collaboration and conduct of value-added courses etc., were discussed and a team of faculty members of ECE including Dr. P. Vijayalakshmi, Prof & Head, Dr. R. Rajavel and Dr. R. Kishore, ASPs, attended the meeting.

- ▶ Dr. R. Rajavel, ASP, visited Ford Motors Private Limited, Chennai along with Dr. P. Vijayalakshmi, Prof & Head, & Dr. S. Radha, VP/SSN CE to discuss on one credit course, internship for students & faculty and projects in the area of IoT, Cyber Security, Design Thing and Full Stack development on 22.08.2022.

► Dr. R. Rajavel, ASP , Dr. P. Vijayalakshmi, Prof & Head , & Dr. S. Radha, VP/SSN CE, facilitated the execution of a MoU signing between SSN and Ford Motors Pvt. Ltd, Chennai on 25.08.2022.

► Dr. M. Gulam Nabi Alsath, ASP, interacted with Shima Engineering Services regarding the development of transverse mechanism for the ongoing industry funded project on Reflectarray Antennas. Mr. Anand, CEO and Engineers visited the RF and Microwave Testing Lab on 17.09.2022.

► Dr. M. Gulam Nabi Alsath, ASP, along with Dr. S. Radha, VP/SSN CE interacted with HCL Technologies and BigCAT Wireless Team for possible collaboration in the DST SATHI project proposal on 21.09.2022 and 22.09.2022 respectively.

► M/s Alphion India Pvt Ltd visited the RF and Microwave Testing Laboratory on 11.10.2022 and interacted with Dr. M. Gulam Nabi Alsath, ASP, for possible consultancy work.

► Dr. S. Sakthivel Murugan, ASP, Dr. M. Gulam Nabi Alsath, ASP, Dr. R. Hemalatha, ASP, participated in the project discussion with Habitat Trust regarding technology transfer related to image classification for the conservation of endangered species on 27.10.2022.

► Prof. Ian F Akyildiz, Dr. A. Jawahar, Prof. and Dr. N. Prabagarane, ASP visited HCL Technologies, Ambatur for industry interactions on 31.10.2022.

Prof. Ian F. Akyildiz with HCL and SSN Team

EXPERT LECTURES

GUEST LECTURES

► Dr. Richards Joe Stanislaus, Assistant Professor, SENSE, Vellore Institute of Technology Chennai, "Travelling Wave Tubes" on 08.09.2022.

► Dr. Tushar Sharma, Staff RF Engineer, Renesas Electronics "GaN the game changer" on 23.08.2022.

► Professor T. Nandha Kumar, University of Nottingham Malaysia "Concepts of NMOS switching and LNA" on 02.08.2022

FACULTY EXPERT LECTURE

► Dr. N. Venkateswaran, Prof, "Signal Processing and its Applications" organized by IEEE Student Branch of Sri Sairam Engineering College, Chennai on 17.06.2022.

► Dr. M. Gulam Nabi Alsath, ASP, "Optimum Design of Reflectarray Antenna" at the Department of ECE, Saveetha Engineering College, Chennai on 18.06.2022.

► Dr. N. Venkateswaran, Prof, "Image Transforms and Applications" at the IEEE Seasonal School on "Image, Audio, and Video Processing for pattern Recognition", conducted the by IEEE Signal Processing Society (SPS) Madras chapter in association with Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore on 24.06.2022.

► Dr. S. Esther Florence, ASP, "Textile Antennas and Sensors" at the three days FDP on "Printed and Flexible Electronics", organized by the School of Electronics Engineering, VIT Chennai Campus on 27.06.2022.

► Dr. W. Jino Hans, ASP, "Visual-only Speech Recognition using Deep Learning Techniques" at IEEE SPS Seasonal School on "Image, Audio, and Video Processing for Pattern Recognition", organized by the IEEE Signal Processing Society Madras chapter in association with Kumaraguru College of Technology, Coimbatore on 27.06.2022.

► Dr. M. Anbuselvi, ASP, "Compilation techniques; Program-level performance analysis" for the AU sponsored FDTP conducted by the Department of ECE, PSNA College of Engineering and Technology, Dindugal on 06.07.2022.

► Dr. M. Gulam Nabi Alsath, ASP, "High Gain Antenna Variants for satellite Communications" at the Department of ECE, Dr. Mahalingam College of Engineering and Technology, Pollachi on 29.07.2022.

► Dr. S. Ramprabhu, ASP, "Applications of FSS for antenna gain enhancement" during the DRDO sponsored two days national seminar on "Modern antenna design for 5G and its related applications" held at KPR Institute of Engineering and Technology, Arasur during August 22-23, 2022.

► Dr. M. Gulam Nabi Alsath, ASP, "Wearable and Implantable Antennas" during the National Seminar on "Recent Trends in Antenna Engineering and Applications in Biomedical Field" organized by Institution of Engineers, Tamil Nadu State Centre in association with Easwari Engineering College, Chennai on 23.08.2022.

► Dr. P. Kaythry, ASP, "Climate Change and Health" at Shiv Nadar University, Chennai on 29.08.2022.

► Dr. R. Hemalatha, ASP, "IoT and its Applications- Deployment Perspective" in the webinar conducted by Saveetha Engineering College, Chennai on 15.09.2022.

► Dr. B. Ramani, ASP, "Gesture to Speech Conversion" in the 3-days online FDP on "AI-based Assistive Technologies" organized by the School of Electronics Engineering, Vellore Institute of Technology, Chennai during October 06-08, 2022 on 07.10.2022.

► Dr. M. Gulam Nabi Alsath, ASP, "Reconfigurable Reflectarray Antennas: Design and Development" during the two-day National Seminar organized by the Department of ECE, Velammal College of Engineering and Technology, Madurai on 10.10.2022.

► Dr. M. Gulam Nabi Alsath, ASP, "Antenna Efficiency and Dielectric Constant Measurements" during the 6-day FDP on "RF Measurements" organized by the Centre for Electronics Skill Development, SRM Institute of Science and Technology, Chennai on 28.10.2022.

► Dr. N. Edna Elizabeth, Prof., "Latest developments in the field of IOT, AI focused on security" on 29.11.2022 for M.F.Tech students, National Institute of Fashion Technology (NIFT), Taramani, Chennai.

- The Department of ECE, CSE & IT jointly organized a one Credit/Value Added course titled "IoT Security" in association with Ford Motors Private Limited, Chennai, India. The course is handled by Mr. Nambivengadam Srinivasan, General manager, Enterprise Cyber Advisory & Consulting Services, Ford Global Business Services and Mr. Subramanian KM, cyber security consultant at Ford Global Business Services, Chennai, Tamil Nadu during Oct. 31, 2022 to November 11, 2022.

- Dr. S. Sakthivel Murugan, Dr. K. Muthumeenakshi, ASPs, along with Ocean Society of India (Chennai chapter) conducted an international webinar on "Importance of Ocean & Blue Economy" on 08.06.2022 as part of World Ocean Day celebrations.

- Dr. N. Venkateswaran, Prof, coordinated the IEEE SPS Seasonal School on "Image, Audio and Video Processing for pattern Recognition" sponsored by the IEEE Signal Processing Society in association with Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore from June 23-28, 2022.

- As part of the Griffith University Australia-SSN webinar series on Learning & Teaching, a talk by Associate Professor Cesar Ortega-Sanchez from Curtin University, Australia, entitled "Learning and teaching: Putting the pieces together" was organized on 12.07.2022.

- The Department of Electronics and Communication along with the SSN Research Centre organized the 2nd International Conference on "Sustainable Materials and Technologies for Bio and Energy Applications" (SMTBEA-2022) during 13-15 Jul. 2022. 302 authors presented papers along with the keynote talks of 9 highly reputed speakers from international labs (Spain, NASA-USA, Japan, Taiwan, Denmark, Romania, etc.) and 7 speakers from Indian labs (NPL, IISc, IITK, DRDO and Anna University).

- Dr. B. Ramani, ASP, coordinated the One-Day Online FDP on "Array Signal Processing for RADAR Applications" organized by IEEE Signal Processing Society, Madras Chapter in association with Department of ECE, SSN CE on 18.08.2022.

- Dr. N. Venkateswaran, Prof/BME, SSN IQAC and Dr. S. Ramprabhu, ASP, SSN IIC organized a webinar titled "Insights on Patents" by Dr. G. Sai Narayanan, Technology Director, Engineering and R& D services, HCL Technologies, Chennai on 17.08.2022.

- Dr. P. Vijayalakshmi, Prof & Head, and Dr. S. Ramprabhu, ASP, SSN IIC organized a webinar on "Assistive technology and start-up challenges" by Prof. Dr M Balakrishnan, IIT Delhi on 25.08.2022.

- Dr. K.T. Selvan, Prof, Dr. S. Karthie, ASP, and Dr. S. Esther Florence, ASP, as coordinators, organized a "One-Day Online Course on Fundamentals of Bioelectromagnetics" on 24.09.2022. The speakers at this course were: Dr. K.T. Selvan, Dr. S. Esther Florence, Dr. Cynthia Furse

- As part of the Griffith University - SSN Learning & Teaching webinar series, Dr. V. Janakiraman, IIT Madras, delivered a webinar on "A method of conducting un-proctored exams" on 26.10.2022.

- Dr. B. S. Sreeja, ASP organized the 2-day Industrial Workshop on "Electrochemical Biosensors" during November 23-24, 2022 in coordination with Technando Technologies LLP. Dr. Martin Peacock, Dr. André Fernandes from Zimmer and Peacock provided instruction to the participants.

EVENTS ATTENDED

▶ Dr. R. Kishore, ASP, attended "Mentor Development Programme - a unique training programme that trains people to be a Mentor, assisting Job Seekers become Job and Wealth Creators", organized by Bharatiya Yuva Shakti Trust (BYST) in association with SSNCE on June 15-16, 2022.

▶ Dr. N. Venkateswaran, Prof, attended "IEEE SPS Seasonal School on Image, Audio and Video Processing for Pattern Recognition" organized by IEEE Signal Processing Society Madras Chapter in association with Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore-641049 from June 23-28, 2022.

▶ Dr. P. Vijayalakshmi, Prof & Head, attended "AI 2.0 - Quantum model for consciousness and Neuro realistic intelligence" hosted by BVICAM, New Delhi on 02.07.2022.

▶ Dr. S. Ramprabhu, ASP, attended "Protecting your IP- Case Studies on Litigation" organized by the IIC-SSNCE on 09.07.2022.

▶ Dr. S. Karthie, ASP, attended "Phase Change Material (PCM) Switches and their Microwave and Millimeter-wave Applications" organized by IEEE MTT-S on 12.07.2022.

▶ Dr. N. Edna Elizabeth, Prof, attended "Faculty Orientation Session (Autonomous Colleges) - Nalaiya Thiran" on 14.07.2022.

▶ Dr. P. Vijayalakshmi, Prof & Head, attended "IITMAA Guru Talks - Responsible Artificial Intelligence" by Prof. Anjana Susarla, University of Michigan on 15.07.2022.

▶ Dr. S. Ramprabhu, ASP, attended "IIC Regional Meet"' conducted at Satyabhama Institute of Science and Technology on 21.07.2022.

▶ Dr. P. Kaythry, ASP, attended "Fostering Industrial Research Success Together - Smart Technologies for Sustainability" organized by Singapore University of Technology and Design on 27.07.2022.

▶ Dr. R. Kishore, Dr. B. Ramani, Dr. R. Rajavel, Dr. W. Jino Hans, Dr. S Hanis, ASPs, attended "Nalaiya Thiran - Experiential Project Based Learning - Master Training Program on Enterprise Design Thinking for nominated Mentors" organized by ICT Academy in collaboration with IBM during 29-30 July, 2022.

▶ Dr. B. S. Sreeja, ASP, attended "Laboratory Animal Handling Techniques and Ethics" organized by C. L. Baid Metha College of Pharmacy from August 22-26, 2022.

▶ Dr. S. Karthie, ASP, attended "IEEE Authorship and Open Access Symposium: Tips and Best Practices to Get Published from IEEE Editors" organized by IEEE on 30.08.2022.

▶ Dr. S. Karthie, ASP, attended "Challenges and Opportunities in Beyond-5G and 6G Communication" organized by IEEE MTT-S on 13.09.2022.

▶ Dr. M. Gulam Nabi Alsath, ASP, attended "One-Day Online Course on Fundamentals of Bioelectromagnetics" on 24.09.2022.

▶ Dr. G. Durga, ASP, attended "A Peek into Advanced Xilinx Technologies" conducted by Sandeepani School of Embedded System Design, Bangalore during October 12-14, 2022.

▶ Dr. G. Durga, ASP, attended "Research Opportunities in Semiconductor Materials and Devices (ROSMD-2022)" organized by the Department of ECE, SRM IST, Chennai in association with IIITDM, Kancheepuram during October 19-24, 2022.

▶ Dr. P. Kaythry, ASP attended a one-day training Programme for NSS Programme Officers at Anna University, Chennai on 11.10.2022.

▶ Dr. K. J. Jegadish Kumar, ASP successfully completed the DEF-ISL short-term virtual training programme on "Basic Indian Sign Language" conducted by DeaF EnAbled Foundations, Hyderabad from 05.09.2022 to 17.10.2022 and scored C-Grade.

▶ Dr. S. Esther Florence, ASP participated in the two-day Workshop on "Electrochemical Biosensors" organized by Zimmer and Peacock and Sri Sivasubramaniya Nadar College of Engineering during November 23-24, 2022.

▶ Dr. S. Esther Florence, ASP attended the International Conference on Technical Textiles organized by CII, Department of Textiles, Government of Tamil Nadu & Ministry of Textiles, Government of India during Nov. 25-26, 2022.
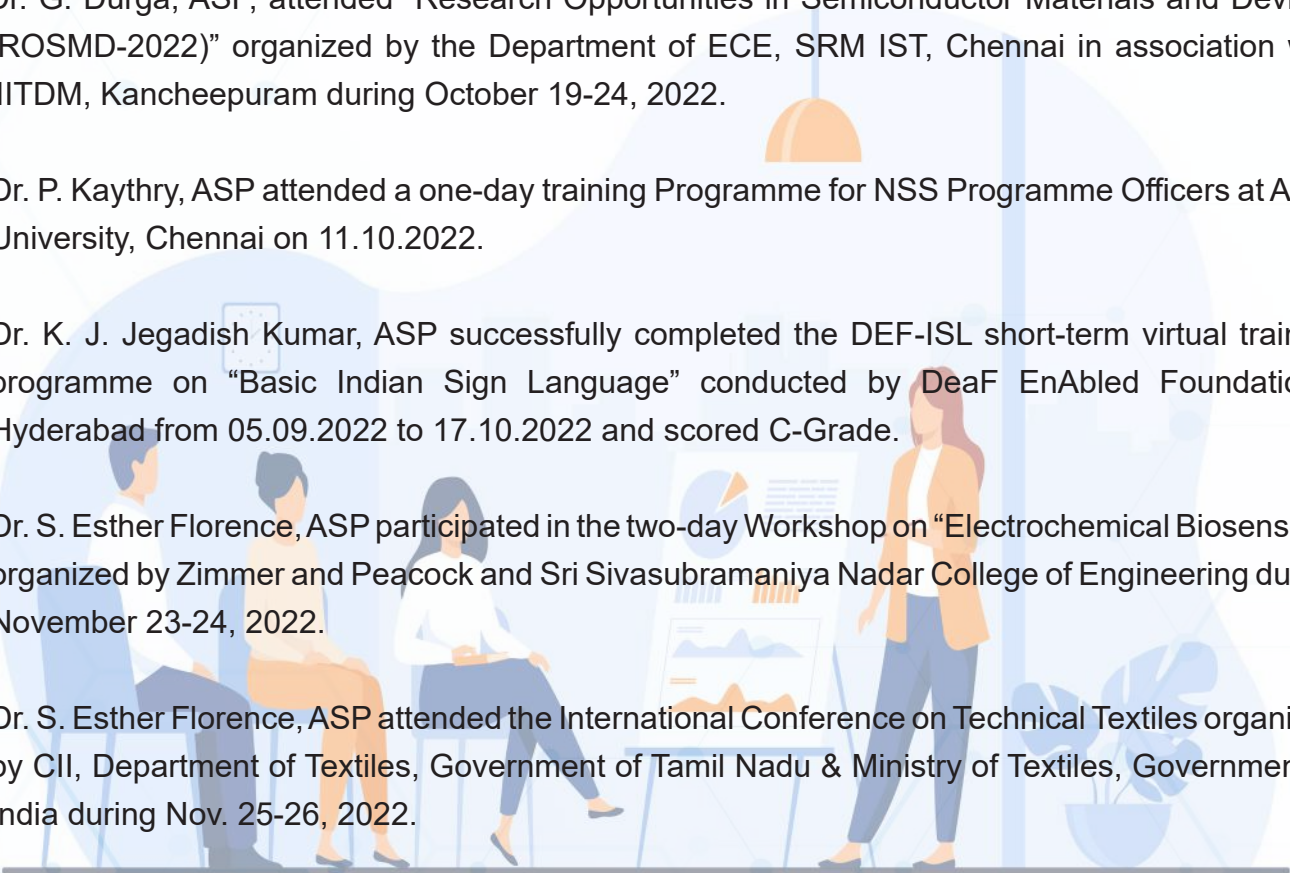
PROFESSIONAL ROLES AND RECOGNITIONS

» Dr. N. Edna Elizabeth, Prof, participated as an evaluator in the webinar "Project Evaluation and Metric Assessment session - Nalaiya Thiran" conducted by IBM on 12.08.2022 and 26.08.2022.

» Dr. M. Gulam Nabi Alsath, ASP, acted as External Examiner for the final year project viva-voce examination held at the Department of Electronics, Madras Institute of Technology, Chrompet on 28.06.2022.

» Dr. P. Vijayalakshmi, Prof & Head, was appointed by the VC, VIT/ Vellore as a member of search committee for Registrar, VIT Bhopal and acted as an interview panel member on 12.06.2022.

» Dr. P. Kaythry, ASP, participated as session Chair in Virtual International Conference on "Technological Innovations in Control, Communication and Automation (TICCA'22)" organized by Easwari Engineering College on 29.06.2022.

» Dr. R. Jayaparvathy, Prof, as NBA expert team member evaluated UG- Electronics and Telecommunication Engineering program of Siddharth Institute of Engineering & Technology, Andhra Pradesh during 01-03 July, 2022.

» Dr. K. T. Selvan, Prof, attended the fifth Board of Studies meeting of the ECE department of the Kongunadu College of Engineering & Technology on 27.07.2022.

» Dr. M. Gulam Nabi Alsath, ASP, was appointed as a Board of Studies Member for the M.Tech course on Sensor Technology to be offered by the Department of Applied Physics, Defence Institute of Advanced Technology (DIAT), Pune, an R&D Institute funded by DRDO under the Ministry of Defence, GoI. The first BoS meeting was completed on 27.07.2022.

» Dr. M. Gulam Nabi Alsath, ASP, was invited by DST-SERB to review two project proposals submitted for possible funding under Core Research Grant scheme during July 2022.

» Dr. R. Jayaparvathy, Prof, was invited as Technical Program Committee Member for the conference ICIIET 2022 to be organized by PSG College of Technology, Coimbatore. She reviewed papers for the same.

» Dr. N. Prabagarane, ASP, Mr. Yashwanth Ramesh, Mr. D. Rohit, UG-ECE 2019-2023 Batch students had meetings with Prof. Marios Lestas, Prof. Abdullah Bin Masood, Prof. Iacovos Ioannou, and Prof. Andreas Pitsillides, University of Cyprus on the project titled "Frederick Uni Metasurface assisted beam with AI control" on 02.06.2022 and 16.06.2022.

» Dr. P. Vijayalakshmi, Prof & Head, as a lead to Assistive technology project, attended NLTM project progress meeting along with other consortium members to discuss the progress made on the project.

» Dr. P. Vijayalakshmi, Prof & Head, along with speech therapists of NIEPMD, had a meeting with Dr. Amarnath, Head R&D, NIEPMD on 22.06.2022 at NIEPMD Muttukkadu, and obtained consent for speech data collection, development of speech assessment tools for the patients in NIEPMD.

» Dr. S. Sakthivel Murugan, ASP, participated and presented proposal for ship time - XVII JSTAC meeting (July 2022-June 2023) held at NIOT (hybrid mode) on 27.06.2022.

» Dr. N. Prabagarane, ASP, as Associate Editor of IET Communications coordinated the review process of the papers assigned by the Chief-in-Editor.

» Mr. M. Vignesh, Mr. V. Vignesh, Mr. S. S. Vishvambar Panth, UG-ECE 2018-2022 batch students, Dr. N. Prabagarane, ASP, Dr. S. Radha, VP/SSNCE, Prof. Dejan Vukobratovic and Prof. Ognjen kundacina had a meeting to discuss on the results of the project on GNN.

» Dr. C. Annadurai, ASP, act as External examiner for viva-voce examination for the course VL5311 - Dissertation II, 4th semester VLSI Design on 23.07.2022 at Department of ECE, CEG, Guindy.

» Dr. M. Gulam Nabi Alsath, ASP, in the capacity of Associate Editor conducted the review process for the research papers submitted to IET Microwaves Antennas and Propagation and Microwave and Wireless Technology Letters. The recommendations were submitted to the Editor in Chief of the journals.

» The fifth Academic council meeting was conducted to review the R2022 PG BoS on 06.08.2022. Dr. P. Vijayalakshmi, Prof & Head, attended the meeting and briefed the minutes of the R2022 PG BoS for M.E Communication systems, M.E Applied Electronics and M.E VLSI Design and amendments carried out for R2021 UG courses as well.

» Dr. R. Vimal Samsingh, ASP/Mech, Dr. C. Arun Prakash, ASP/Mech and Dr. S. Esther Florence, ASP, conducted a training program on "Data processing and Analysis for Industrial Management" for the employees of Nova Carbon Private Limited, Tirunelveli during August 18-19, 2022.

» Dr. P. Vijayalakshmi, Prof & Head, and Dr. K. Muthumeenakshi, ASP, reviewed doctoral students' presentations of the Department of ECE during doctoral scholar's day conducted on 07.09.2022. Ms. Kavitha, RS/ECE and Ms. Akila, RS/ECE received the best oral and poster presentation awards respectively.

≫ Dr. P. Vijayalakshmi, Prof & Head, attended Ethical clearance committee meeting at NIEPMD and presented the MeiTY funded "Assistive speech technologies" project for ethical clearance on 12.09.2022.

≫ Dr. P. Vijayalakshmi, Prof & Head, presented the departmental activities to the IQAC external audit committee and handled the queries raised by them along with IQAC department coordinators on 23.09.2022.

≫ Dr. M. Gulam Nabi Alsath, ASP, interacted with Dr. Usha Natesan, Director, NITTTR, Chennai and Shri. Ramesh Kumar, Senior Administrative Officer, NITTTR, Chennai on 26.09.2022 regarding the project proposal submission on SATHI Foundation establishment at SSN. As an outcome, NITTTR Chennai has kindly consented to be the partner institute for the proposal submission.

≫ Dr. P. Vijayalakshmi, Prof & Head, had a discussion with Mr. Chandran, CEO, Incubation centre, on the speech lab research activities on 26.09.2022.

≫ Dr. M. Gulam Nabi Alsath, ASP, has received approval to edit a special section on "Intelligent Antenna Design for Complex Propagation Environment" for Microwave and Optical Technology Letters (IF: 1.392). This special section is co-edited by Dr. Jaume Anguera, Associate Professor, Department of Telecommunication Engineering, Universitat Ramon Llull, Spain.

≫ Dr. N. Edna Elizabeth, Prof, Dr. R. Kishore, ASP , Dr. S. Hanis, ASP , and Ms. S. Tejaswini, UG-ECE 2020-2024 Batch visited NIFT, Taramani to discuss a project proposal and also did some basic measurements related to the project submitted to DST-TDP on 30.09.2022.

≫ Dr. P. Vijayalakshmi, Prof & Head, attended the project progress meeting for the MeiTY funded project conducted by Dr. Hema A Murthy, IITM, Project leader, NLTM project on 11.10.2022.

≫ Dr. W Jino Hans, ASP/ECE acted as an external expert for auditing the examination question papers/answer scripts /result analysis at the CoE office, Hindustan university on 07.11.2022.

≫ Dr. C. Annadurai and Dr. I. Nelson, ASPs acted as Session Chair for the Virtual National Conference on FCEVT - 2022 conducted by EEE department, SSNCE on 26.11.2022.
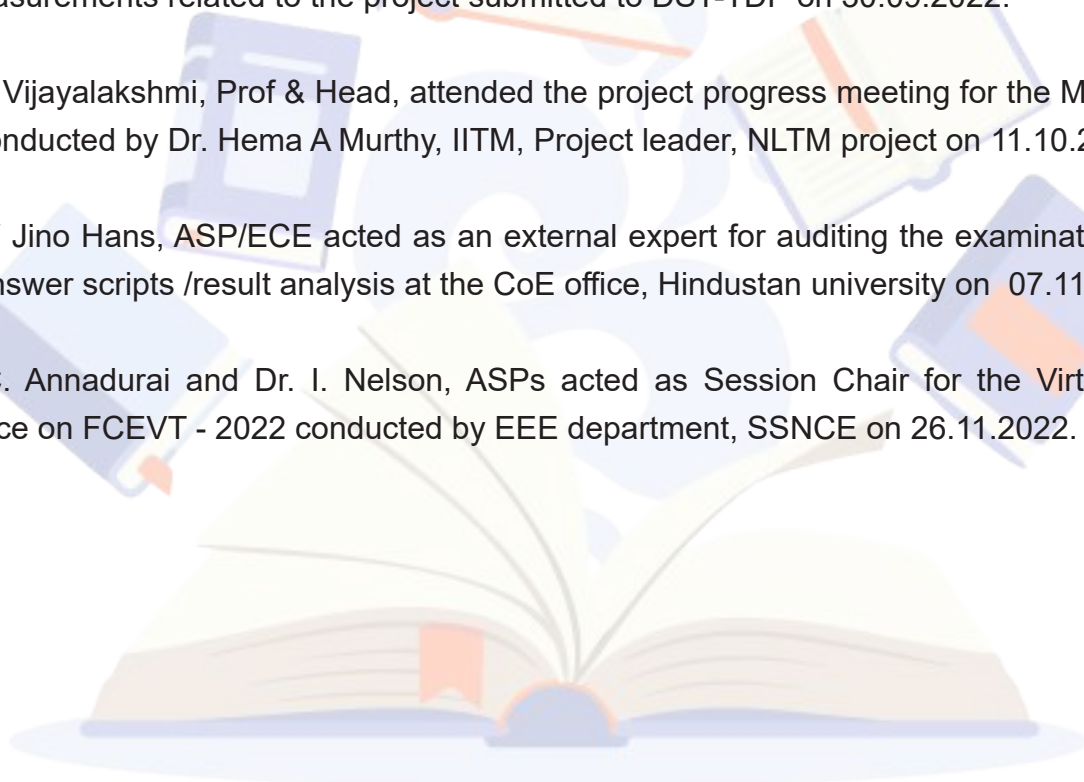
EXTERNAL FUNDING

Presentations:

> A presentation was made by all the consortium members (CDAC Kolkata, Noida, Trivandrum, IIT Dharwad, DAIICT, SNU and SSNCE) on 28.07.2022 for the project titled "Design and development of indigenous audio forensic tools" submitted to MeiTY. Dr. P. Vijayalakshmi, Prof & Head, is the PI from SSNCE.

> Dr. P. Vijayalakshmi, Prof & Head, Dr. B. Bharathi ASP/CSE, Dr. T. Nagarajan, Prof & Head/ CSE, SNUC presented their project submitted to TVA to the Chief technical Officer, IT and Digital Services, Govt. of Tamil Nadu on 12.10.2022.

Proposal Submissions:

> Dr. B. S. Sreeja, ASP, as PI, Dr. Rohit Srivatsava (IIT Bombay, Nano Bios Lab) as Collaborating PI, Dr. S. Radha, VP/SSNCE, Dr. M. Srinivasan, SSNRC as Co-PIs, and Madras Diabetic Research Foundation, Dr. Mohan's Diabetes Specialty Centre as major clinical collaborator submitted a proposal titled "Microelectronic System Integrated Wearable, Minimally Invasive, Continuous Glucose Monitoring and Insulin Delivery System based on Microneedle based Sensing and Therapy" to SreePVF for Rs.300 Lakh.

> Dr. R. Hemalatha, ASP, as PI, Dr. S. Radha, VP/ SSNCE as Co-PI submitted a proposal titled "Developing Drone as a Service (DaaS) for Effective Plant Health Management" to SERB SURE for funding worth Rs. 27.495 Lakh.

> Dr. R. Kalidoss, ASP, as PI, Dr. B. Partibane, ASP, & Dr. K. S. Vishvaksenan, ASP, as Co-PIs submitted a proposal titled "Investigations on Network Coordination for Beyond 5G (B5G) Wireless Systems through Embedded Intelligence" to SERB SURE for funding worth Rs. 27.379 Lakh.

> Dr. A. Jawahar, Prof, as PI, Dr. R. Kishore, ASP, & Dr. N. Prabagarane, ASP, as Co-PIs submitted a proposal titled "Real time Water Quality Monitoring and Prediction System for Thenpennai River" to SERB SURE for funding worth Rs. 29.988 Lakh.

> Dr. K. Muthumeenakshi, ASP, as PI, Dr. S. Radha, VP/SSNCE & Dr. S. Esther Florence, ASP, as Co-PIs submitted a proposal titled "Smart Footwear with Hybrid Energy Harvesting: An Aid to Self-Powered Wearable Sensors" to SERB-SURE for funding worth Rs.19.6 Lakh.

> Dr. S. Ramprabhu, ASP, as PI, Dr. M. Gulam Nabi Alsath, ASP, & Dr. S. Radha,VP/SSN CE as Co-PIs submitted a proposal titled "Experimental investigations on the design of fabric-based frequency selective surface for mitigation of harmful electromagnetic radiations from mobile phones" to SERB-SURE for funding worth Rs. 28.88 Lakh.

> Dr. K. J. Jegadish Kumar, ASP, as PI, Dr. M. Gulam Nabi Alsath, ASP, as Co-PI submitted a proposal titled "Design and development of high-performance antenna systems for ingestible wireless devices" to SERB-SURE for funding worth Rs. 24 Lakh.

> Dr. R. Amutha, Prof, as PI, Dr. S. Radha, VP/SSN CE, Dr. W. Jino Hans, ASP, Dr. C. Vinoth Kumar, ASP, as Co-PIs submitted a proposal titled "Development of air-writing recognition system to enhance the learning skills of special children" to SERB-SURE for funding worth Rs. 20 Lakh.

> Dr. S. Kirubaveni, ASP, as PI, Dr. M. Gulam Nabi Alsath, ASP, & Dr. S. Radha, VP/SSN CE as Co-PIs submitted a proposal titled "Optimum design of highly transparent compact multi-service antennas for intelligent transport systems" to SERB-SURE for funding worth Rs. 30 Lakh.

> Dr. R. Rajavel, ASP, as PI, Dr. M. Balaji, ASP/EEE & Dr. A. K. Lakshminarayanan, ASP/Mech as Co-PIs submitted a proposal titled "Design and development of a cost-effective predictive maintenance system for induction motors using deep learning framework" to SERB-SURE for funding worth Rs. 22.6 Lakh.

> Dr. B. S. Sreeja, ASP, as PI & Dr. S. Radha, VP/SSNCE as Co-PI submitted a proposal titled "Low-cost dosage and frequency of dosage programmable painless transdermal insulin delivery patches for type I diabetic patient" to SERB-SURE for funding worth Rs. 28 Lakh.

> Dr. S. Sakthivel Murugan, ASP, as PI, Dr. K. Murugesan, ASP/EEE & Dr. M. Senthilkumaran, ASP/EEE as Co-PIs submitted a proposal titled "Hybrid underwater energy harvesting system using ocean water and solar cell" to SERB-SURE for funding worth Rs. 27.31 Lakh.

> Dr. V. Vaithianathan, ASP, as PI & Dr. K. S. Jayakumar, ASP/Mech as Co-PI submitted a proposal titled "Development of nurse-like assistant for an elderly care service using NAQ humanoid robot" to SERB-SURE for funding worth Rs. 29.54 Lakh.

> Dr. B. Ramani, ASP, as PI, Dr. W. Jino Hans, ASP, & Dr. P. Vijayalakshmi, Prof & Head, as Co-PIs submitted a proposal titled "A learning aid for documenting online/ classroom lectures" to SERB-SURE for funding worth Rs. 18.44 Lakh.

> Dr. S. Radha, VP/SSNCE as PI & Dr. M. Gulam Nabi Alsath, ASP, as Co-PI submitted a proposal titled "Development of mm-wave and THz testing facility" to DST-SATHI for funding worth Rs. 20 Crore. IIT Madras, NITTTR Chennai, SNU Chennai, HCL Technologies are the collaborating organizations in the project proposal.

> Dr. P. Kaythry, ASP, as PI, Dr. P. Sangeetha, ASP/Civil & Dr. R. Kishore, ASP, as Co-PIs submitted a proposal titled "Design and development of IoT solution for offshore heterogeneous structure monitoring using distributed sensing system" to SERB-SURE for funding worth Rs. 29 Lakh.

> Dr. K. Nirmala, ASP/BME, as PI, Dr. C. Vinoth Kumar, ASP, as Co-PIs submitted a proposal titled "Investigation of Glaucoma comorbidities in Capillary Morphology using Optical images of Nailfold region" to SERB-POWER for funding worth Rs. 27 Lakh.

INTELLECTUAL PROPERTY RIGHTS

Patents Filed and Published:

▶ Ms. N. Kavitha, RS/ECE; Dr. M. Gulam Nabi Alsath & Dr. S. Kirubaveni, ASPs/ECE, "Bandwidth Enhancement of Reflectarray Using Overlapping Tri-resonance Phase Distribution" to Indian Patent Office on 4th Nov. 2022. (Application No.: 202241063131)

JOURNAL ARTICLES

▶ Mr. V. Chandra Prasad, Faculty/KPRIET, Dr. S. Ramprabhu, ASP, "Compact Uniform Folded Section Rat-Race Couplers with Harmonic Suppression" in IETE Journal of Research, pp. 1-11, May 2022. (Clarivate Analytics, IF: 2.333)

▶ Ms. I. Divya, RS, Dr. K. Muthumeenakshi, ASP, Dr. S. Radha, VP/SSNCE, "An optimization of a reconfigurable CPW antenna for RF energy harvesting cognitive radio application" in the journal Frequenz, vol. 76 (3-4), pp. 185-198, April 2022. (Clarivate Analytics, IF: 0.737)

▶ Mr. B. Mohammed Hashim, PT-RS, Dr. R. Amutha, Prof, "Elderly Hajj pilgrims activity recognition based on candidate classification technique" in the Concurrency and Computation: Practice and Experience, vol. 34(13), pp. 1-15, June 2022. (Clarivate Analytics, IF: 0.55)

▶ Dr. K. Malathi, Prof/CEG, Ms. S. Padmathilagam, RS/CEG, Dr. M. Gulam Nabi Alsath, ASP , Mr. M. Vikneshwaran/CEG, Dr. P. Sandeep Kumar, AP/SRM, Dr. A. K. Shrivastav, Prof/Saveetha Engineering College "Low Profile Multi-Polarization Diversity UWB Antenna for Body Centric Communications" in the International Journal of Microwave and Wireless Technologies, July 2022 (Clarivate Analytics, IF: 1.064)

▶ Ms. Nethraa Sivakumar, Ms. Pooja Srinivasan, Mr. Nikhil Viswanath, UG-ECE 2018-2022 Batch students, Dr. N. Venkateswaran, Prof, "Decision Tree Based Radio Link Failure Prediction for 5G Communication Reliability" in the ITU Journal on Future and Evolving Technologies, vol. 3, pp. 1-16, July2022. (Others, IF: 0.03)

▶ Mr. M. Varun, PT-RS , Dr. C. Annadurai, ASP, "Intelligent Spectrum Sensing Using Optimized Machine Learning Algorithms for Cognitive Radio in 5G Communication" in the Journal of Internet Technology, vol. 23, no. 4, pp. 827-836, July 2022. (Clarivate Analytics, IF: 1.14)

▶ Ms. K. Sumathi, PT-RS , Dr. K. K. Nagarajan, ASP , Dr. R. Srinivasan, Prof/IT "Sensitivity Analysis of Gallium Nitride Quantum Dot LED" in the Journal of Nanoelectronics and Optoelectronics, vol. 16 (8), pp. 1204-1214, August 2021. (Clarivate Analytics, IF: 1.069)

▶ Ms. S. Shanmathi, RS/CEG, Dr. K. Malathi, Prof/CEG, Dr. M. Gulam Nabi Alsath, ASP , Dr. Y. V. Ramana Rao, Prof/CEG, Ms. R. Shini, RS/CEG, Prof. Jeevani WJ, Prof/Wayamba University of SL, Prof. D. N. Udwawala, Prof/University Peradeniya, SL, "Miniaturized wideband 5G millimeter-wave antenna with two-port positioning analysis for vehicular communication" in the journal Applied Physics A, August 2022 (Clarivate Analytics, IF: 2.983)

▶ Dr. T. A. Mariya Celin, AP/VelTech, Dr. P. Vijayalakshmi, Prof & Head , Dr. T. Nagarajan, Prof & Head/CSE/SNU, "Data augmentation techniques for transfer learning based continuous speech recognition" in the journal Circuits, Systems and Signal Processing, August 2022. (Clarivate Analytics, IF: 2.311)

▶ Mr. Rama Krishna Reddy Venna, R , Dr. G. Durga, ASP, "Design of novel area-efficient coplanar reversible arithmetic and logic unit with an energy estimation in quantum-dot cellular automata" in The Journal of Supercomputing, pp. 1-18, August 2022. (Clarivate Analytics, IF: 2.557)

▶ Dr. I. Nelson, ASP , Dr. C. Annadurai, ASP , Dr. K. Nirmala Devi, ASP/Kongu Engineering College "An Efficient AlexNet Deep Learning Architecture for Automatic Diagnosis of Cardio-Vascular Diseases in Healthcare System" in the Wireless Personal Communications, vol. 126 (1), pp. 493-509, September 2022. (Clarivate Analytics, IF: 2.017)

▶ Mr. Anandan Ramalingam, PT-RS , Dr. C. Annadurai, ASP, "Linear Polarization to Circular Polarization convertor loaded orthogonally placed two-port ring ceramic-based MIMO antenna for WLAN applications" in International Journal of Circuit Theory Applications, pp. 1-10, September 2022. (Clarivate Analytics, IF: 2.378)

▶ Mr. S. Johanan Joysingh, RS/SSN, Dr. P. Vijayalakshmi, Prof & Head , Dr. T. Nagarajan, Prof & Head/CSE/SNU Chennai "Chirp group delay-based onset detection in instruments with fast attack" in the journal Circuits, Systems and Signal Processing, September 2022. (Clarivate Analytics, IF: 2.311)

▶ Ms. M. Dhana Lakshmi, PT-RS , Dr. S. Sakthivel Murugan, ASP, "Contrast Improvement on Side Scan Sonar images using Retinex based edge preserved technique" in Marine Geophysical Research, May 2022. (Clarivate Analytics, IF: 2.693)

▶ Ms. G. Annalakshmi, RS , Dr. S. Sakthivel Murugan, ASP, "Fractal adaptive weight synthesized–local directional pattern-based image classification using enhanced tree seed algorithm" in Environmental Science and Pollution Research, June 2022. (Clarivate Analytics, IF: 4.223)

▶ Dr. P. Senthil Kumar, Prof/Chem, Dr. B. S. Sreeja, ASP , Dr. G. Padmalaya, SRF/Chem, Kungumaraj Krishna Kumar, SRF/Chem "An Efficient High-Powered Sulfamethaxazole Sensor Based on p–n Junction Heterostructures Using Nanostructured ZnO Thin Film and Graphene Oxide Sheets" in the journal Industrial & Engineering Chemistry Research, June 2022. (Clarivate Analytics, IF: 4.326)

▶ Mr. M. Somasekar, PT-RS, Dr. S. Sakthivel Murugan, ASP, "Reduction of Artifacts and Edge Preservation of Underwater Images Using Deep Convolution Neural Network" in Fluctuation and Noise Letters, vol. 21 (4), 2250025, July 2022. (Clarivate Analytics, IF: 1.65)

▶ Mr. K. Balaji, PT-RS , Dr. S. Sakthivel Murugan, ASP , Mr. R. Logeshwaran, PT-RS, "Underwater Cognitive Acoustic Networks Architecture, Development and Deployment" in the International Journal of Next-Generation Computing, vol. 13 (2), pp. 222-238, July 2022. (Clarivate Analytics, IF: 0.04)

▶ Ms. K. Bhuvaneswari, SRF , Dr. B. S. Sreeja, ASP , Dr. S. Radha, VP/SSNCE, Dr. P. Govindasamy, SSN RC, Palanivel Thangavelu/ Periyar University, Vignesh Shanmugam/ Periyar University, Elavarasan Nagaraj, SSN RC, Venkatesh Gopal, SSN RC, Dr. M. Srinivasan, SSN RC, Dr. P. Ramasamy, Dean/Research "Strontium-supported erbium oxide nanoparticles for efficient organic pollutant degradation under UV–Visible light" in the Journal of Materials Science: Materials in Electronics, vol. 33, pp. 20384-20398, September 2022. (Clarivate Analytics, IF: 2.478)

▶ Dr. P. Senthil Kumar, Prof/Chem, Dr. B. S. Sreeja, ASP, Kungumaraj Krishna Kumar, SRF/Chem, Dr. G. Padmalaya, SRF/Chem, "Investigation of Nafion coated GO-ZnO nanocomposite behaviour for sulfamethoxazole detection using cyclic voltammetry" in the journal Food and Chemical Toxicology, vol. 167, 113311, September 2022. (Clarivate Analytics, IF: 4.6)

▶ Ms. T. Deepa, RS/SRM, Dr. T. Rama Rao, Prof/SRM, Dr. P. Sandeep Kumar, AP/SRM, Dr. K. Malathi, Prof/CEG, Dr. M. Gulam Nabi Alsath, ASP , Dr. P. Devi Sowjanya, Amrita Vishwa Vidyapeetham, Dr. Sachin Kumar, AP/SRM "On the Design and Performance Analysis of Flexible Planar Monopole Ultra-Wideband Antennas for Wearable Wireless Applications" in the International Journal of Antennas & Propagation, vol. 2022, Article ID   5049173, September 2022. (Clarivate Analytics, IF: 1.244)

▶ Dr. K. Malathi, Prof/CEG, Ms. S. Shanmathi, RS/CEG, Dr. M. Gulam Nabi Alsath, ASP , Dr. P. Sandeep Kumar, AP/SRM "A Novel Low-Profile 5G MIMO Antenna for Vehicular Communication" in the International Journal of Antennas and Propagation,   vol. 2022, Article ID 9431221, October 2022. (Clarivate Analytics, IF: 1.244)

▶ Dr. K. T. Selvan, Prof , Dr. Cynthia M. Furse, University of Utah, USA "Professional development ideas for students and young professionals" in the journal IEEE Antennas and Propagation Magazine, vol. 64 (5), pp. 122-127, October 2022. (Clarivate Analytics, IF: 3.179)

▶ Dr. C. Annadurai, ASP , Dr. I. Nelson, ASP , Dr. K. Nirmala Devi, Kongu Engineering College, Dr. R. Manikandan, SASTRA, Dr. N. Z. Jhanjhi, Taylor's University, Malaysia, Dr. Mehedi Masud, Abdullah Sheikh, Taif University, Saudi Arabia "Biometric Authentication-Based Intrusion Detection Using Artificial Intelligence Internet of Things in Smart City" in the journal Energies (MDPI), vol. 15 (19), pp. 1-14 (7430), October 2022. (Clarivate Analytics, IF: 3.252)

▶ Dr. R. Kalidoss, ASP, "Design of a seven-band perfect metamaterial absorber for THz sensing applications" in Pramana - Journal of Physics, vol. 96 (4), pp. 1-8, October 2022. (Clarivate Analytics, IF: 2.699)

▶ Mr. T. Dhakshinamoorthy, RS , Dr. Prita Nair, Prof/SNU Chennai, Dr. S. Ramprabhu, ASP , Dr. S. Radha, VP/SSNCE, "Honey Comb Structured Angularly Stable Band Stop Frequency Selective Surface Based on hexagonal loop unit cells" in IETE - Journal of research, October 2022. (Clarivate Analytics, IF: 1.877)

▶ Dr. R. Kishore, ASP , Dr. I. Ioannou, Dr. C. Christophorou, University of Cyprus, Dr. N. Prabagarane, ASP , Dr. V. Vassiliou, Mr. S. Vignesh, Mr. H. Vinayak, Mr. S. Venkatesh, UG-ECE 2013-2017 Batch students, Dr. A. Pitsillides, University of Cyprus "A Security Protocol for D2D Communications in 5G Networks using Elliptic Curve Cryptography" in the International Journal of Information Security, vol. 21, pp. 1389-1408, October 2022. (Clarivate Analytics, IF: 2.427)

▶ Nirmala Krishnamoorthi, Sowmiya E C and Vinoth Kumar Chinnababu, "CNN based Detection and Segmentation of Lung Tumor from 3D CT Image", Neuroquantology, Vol. 20, No. 7, pp. 3984-3998 July, 2022.

▶ Mr. B. Mohammed Hashim, PT-RS, Dr. R. Amutha, Prof, ""Deep transfer learning based human activity recognition by transforming IMU data to image domain using novel activity image creation method", Journal of Intelligent & Fuzzy Systems, vol. 43(4), pp. 2883-2890, July 2022. (Clarivate Analytics, IF: 1.739).

▶ Dr. A. Elakkiya, SEC, Dr. K. A. Karthikeyan, SSNCE, Dr. E. Manikandan/VIT, Dr. S. Radha, VP, "Terahertz seventeen-band metamaterial absorber based on sunflower-typed structure" in the Journal of Optoelectronics and Advanced Materials, vol. 24, no. 9-10, pp. 426-432, September-October 2022. (Clarivate Analytics, IF: 0.5)

▶ Ms. R. Shini, RS/CEG, Dr. K. Malathi, Prof/CEG, Dr. M. Gulam Nabi Alsath, ASP, "A Novel Miniaturized Band-Stop Frequency Selective Surface With Ultra-Wideband Characteristics" in Radio Science, vol. 57 (11), e2022RS007439, November 2022. (Clarivate Analytics, IF: 1.68)

▶ Ms. J. Abanah Shirley, RS, Dr. S. Esther Florence, ASP, Dr. B. S. Sreeja, ASP, Dr. S. Radha, VP, "Bio-compatible piezoelectric material based wearable pressure sensor for smart textiles" in Smart Materials and Structures, vol. 31, pp. 1-10, November 2022. (Clarivate Analytics, IF: 3.585)

▶ Mr. V. Yokesh, PT-RS, Dr. M. Gulam Nabi Alsath, ASP, Dr. K. Malathi, Prof., "Defected Microstrip Structure-based Near-End and Far-End Crosstalk Mitigation in High-Speed PCBs for Mixed Signals" in Microelectronics International, November 2022. (Clarivate Analytics, IF: 0.942)

▶ Dr. G. Durga, Mr. Susanta Kumar Pal, Dr. R. Srinivasan, Prof/IT, "Reconfigurable FET Based Tunable Ring Oscillator and its Single Event Effect Performance" in the Journal of Circuits, Systems and Computers, vol. 31(18), pp. 1-18, November 2022. (Clarivate Analytics, IF: 1.278)

CONFERENCE PRESENTATIONS

» Mr. C. Ashok, PT-RS, Ms. Vaddi Lakshmi Satya Sai, Ms. Sarojini, Dr. N. Venkateswaran, Prof, presented a paper titled "Direction-of-Arrival Estimation of Multiple Closely Spaced Signals using MVDR-CSVR Approach" at the International Conference - IETE CHENCON 2022 organized by IETE Chennai Centre held during April 22-23, 2022. pp. 47 -52.

» Ms. V. Krishi Divya Dharshini, Ms. K. Nethra Prakash, Ms. A. Shafiya Sidrath, UG-ECE 2019-2023 Batch students, Dr. N. Venkateswaran, Prof, presented a paper titled "Diagnosis of Stages of Acute Lymphoblastic Leukaemia using Image Processing and Deep Learning" at the International Conference - IETE CHENCON 2022 organized by IETE Chennai Centre held during April 22-23, 2022. pp. 116-121.

» Ms. Charu Jain, Ms. Indu Subramanian, Ms. Meghna Govind, UG-ECE 2018-2022 Batch students, Dr. N. Venkateswaran, Prof, presented a paper titled, "Artificial Intelligence and Machine Learning Based Wireless Localization" at the International Conference - IETE CHENCON 2022 organized by IETE Chennai Centre held during April 22-23, 2022. pp. 74-79.

» Dr. K. Muthumeenakshi, ASP, presented a paper titled "A comprehensive analysis on the performance of antenna design using machine learning techniques" in the International Conference on Signal & Data Processing (ICSDP) organized by VIT Bhopal University held during June 10-11, 2022. The paper was co-authored by Dr. S. Radha, VP/SSNCE.

» Dr. S. Ramprabhu, ASP , Mr. L. Abdulla Khan, Mr. S. Nahul, Ms. K. Nandhini, Mr. Mohd Shahrukh, UG-ECE 2016-2020 Batch students presented a paper titled "Design and Fabrication of a Miniaturized Microwave Absorber with Wide Band Absorption Characteristics" in the IEEE Wireless, Antenna & Microwave Symposium - WAMS 2022 held during June 05-08, 2022 organized by NIT Rourkela, India.

» Ms. Swati Vivekanandan, PG-CS 2020-2022 Batch, Dr. P. Vijayalakshmi, Prof & Head, presented a paper title "Forensic speech enhancement of voice prints and speaker identification under mismatched conditions" in the IEEE International conference CONECCT 2022 on 09.07.2022.

» Ms. G. Pavatharani, PG-CS 2020-2022 Batch, Dr. C. Vinoth Kumar, ASP , Dr. A. Jawahar, Prof, presented a paper titled "Cell Tracking in Microscopic Images using Dynamic Memory Network" in the Fourth International Conference on Emerging Trends in Science, Engineering & Technology (ICETSET 2022), organized by Jerusalem College of Engineering during July 7-8, 2022.

» Dr. P. Nirmala, AP/VIT, Dr. R. Kishore, ASP, Dr. V. R. Balaji, Dr. J. Florence Gnana Poovathy, AP/VIT presented a paper titled "A Short review on Image Fusion techniques based on Optimization algorithms" in the 6th International Conference on Electronic Design, ICED 2022, Malaysia, organized by University Malaysia, Perlis on 29.08.2022.

VIVA VOCE EXAMINATIONS

1. Dr. R. Amutha, Prof., conducted the viva- voce examination for her part-time research scholar, Mr. Mohammed Hashim on 07.07.2022.

2. Ms. K. Mrinalini, full time research scholar of Dr. P. Vijayalakshmi, Prof & Head, defended her thesis titled "Development and Evaluation of hybrid machine translation systems for English-to-Indian language under low-resource conditions" on 18.07.2022.

3. Dr. R. Jayaparvathy, Prof, convened the Ph.D viva-voce for her research scholar Ms. S. Annapoorani on 22.07.2022.

4. Ms. T. A. Mariya Celin, fulltime research scholar of Dr. P. Vijayalakshmi, Prof & Head, defended her thesis titled "Development of an augmentative and alternative speech communication aid for dysarthric speakers" on 26.07.2022.

5. Dr. V. Vaithianathan, ASP, conducted PhD Viva Voce Examination for his part-time research scholar, Ms. G. Indumathi on 02.09.2022.

6. Ms. S. Swathi, scholar of Dr. S. Sakthivel Murugan, ASP, defended her thesis titled "Enhancement of Magnetic Induction System using Planar Spiral Coils for Underground Communication" on 12.10.2022.

7. Ms. G. Annalakshmi, scholar of Dr. S. Sakthivel Murugan, ASP, defended her thesis titled "Feature Descriptors and optimization techniques for the classification of coral Images" on 18.10.2022.

8. Dr. K. T. Selvan, Prof. conducted the PhD oral examination for his full-time scholar Ms. M. Akila on 03.11.2022.

9. Dr. B. S. Sreeja, ASP conducted the viva-voce examination for her part-time research scholar, Mr. Mohammed Masood on 04.11.2022.

10. Dr. C. Annadurai, ASP conducted the viva-voce examination for his part-time research scholar Ms. S. Kalpana on 24.11.2022.

STUDENT CO CURRICULAR ACTIVITIES

1. Ms. M. Akila, full-time research scholar of Dr. K. T. Selvan, Prof, was selected as a Mojgan Daneshmand Grant Awardee. This award, administered by the IEEE Antennas and Propagation Society, aims to increase women's visibility at the annual IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting. The award comprises a grant of $1,500 to participate in person at the 2022 IEEE AP-S Symposium on Antennas and Propagation that will take place during July 10-15, 2022 in Denver, Colorado, USA. Apart from receiving the Mojgan Daneshmand Grant Certificate, she presented the following two papers:

   • "Angular Response Analysis of Broadband RCS Reduction Checkerboard Metasurfaces" authored by Ms. M. Akila, RS, Mr. S. Shyam Krishna and Dr.K. T. Selvan,Prof.

   • "Conjugate Match Algorithm-Based Synthesis of RCS Reduction Meta sufaces" authored by Ms. M. Akila, RS, Mr. D. Rohit, Ms. R. Samyuktha, UG- ECE 2019-2023 Batch students and Dr. K. T. Selvan, Prof.

2. Mr. M. Vimal Raj, RS, Ms. G. Annalakshmi, RS , Ms. M. Dhanalakshmi, RS , Ms. S. Mary Cecilia, RS , attended the international webinar on "Importance of Ocean & Blue Economy" organized by Underwater Acoustic Research Laboratory, Department of ECE, Sri Sivasubramaniya Nadar College of Engineering as part of World Ocean Day celebration on 08.06.2022.

3. Ms. M. Ramya, RS, participated in the INUP-Level 1 Familiarization workshop organized by IIT, Madras from June 20-21, 2022.

4. Ms. M. Akila, RS, attended the IEEE Wireless, Antenna, and Microwave symposium (WAMS 2022) held at NIT, Rourkela during June 05-08, 2022 and presented her paper titled "Estimation of reflection phase due to a pair of Jerusalem Cross elements using an equivalent circuit model".

5. Mr. M. Vimal Raj, RS, participated in the online course on "Machine Learning to Deep Learning: A Journey for Remote Sensing Data Classification" organized by Indian Institute of Remote Sensing, Dehradun during July 04-08, 2022.

6. Mr. M. Vimal Raj, RS, participated in the online course on "Satellite Remote Sensing of Atmosphere" organized by Indian Institute of Remote Sensing, Dehradun during July 11-15, 2022.

7. Ms. K. Vijayalakshmi, RS, participated in the 2nd International Conference on "Sustainable Materials and Technologies for Bio and Energy Applications SMTBEA-2022" organized by SSN Institutions in association with Elavenil Science Association & Indian Science and Technology Association during July 13-14, 2022. She attended the lectures by Dr. N. Gopalswamy NASA Goddard Space Flight Center, USA and Dr. Anandh Subramaniam, IIT Kanpur on 13.07.2022 and by Dr. Steve Werely, Purdue University and Dr. R. Jayavel, Anna University on 14.07 2022.

8. Ms. N. Kavitha, RS, attended an expert lecture on "Design and Analysis of Equivalent Circuits in ADS Tool" conducted by IEEE Delhi section Antenna and Propagation society (APS) Chapter Jaipur in association with IEEE RFID Student Chapter, MNIT Jaipur on 20.07.2022.

9. Ms. K. Vijayalakshmi, RS, participated in Two Days Students Hands-on Training Programme on "Thermoelectric Single Crystals and Applications" organized by SSN Research Centre sponsored by SERB, Government of India in association with Indian Association for Crystal growth during August 26-27, 2022.

10. Ms. S. Balambal, UG-ECE 2019-2023 batch student, Ms. Radha Bai Prabhakar, Ms. V. Tejaswini, UG-EEE 2019-2023 batch students under the guidance of Dr. P. Kaythry, ASP, presented a paper online titled "Letting Villages go smart in Indian Scenario" in IEEE TENCON conference held at Auckland during December 07-10, 2021. pp. 703-707.

11. Ms. J. Shweatha, UG-ECE 2019-2023 batch has participated in the "Summer School 2022 Programme" conducted online at Indian Institute of Astrophysics, Bengaluru during held during July 01-08, 2022.

12. Ms. R. Deeksha, UG-ECE 2020-2024 batch attended the two-day workshop on "Hands-on Workshop on Real time Control Applications of STM-32 Series I" conducted by EEE department of SSN College of Engineering during September 09-10, 2022.

STUDENT EXTRA CURRICULAR ACTIVITIES

- Ms. S. Balambal, UG-ECE 2019-2023 Batch was granted the podium finish after finishing in the top ten in the creative writing contest organised by Manipal University's LDQ on 30.08.2021.

- Ms. S. Balambal, UG-ECE 2019-2023 Batch has become a published author in addition to her position as a compiler through her book, "This is Querencia", published by Verses Kindler Publication on 16.04.2022.

- Mr. P. Prasanna Venkatesh, UG-ECE 2019-2023 Batch was a part of the winning team in the SSN Inter Year Cricket Tournament conducted by SSN College of Engineering on 06.05.2022.

INAUGURATION '22

The pride of ECE are its three flagship student communities - *IEEE ComSoc, Tech Club and the AECE*. In the past few months, they conducted numerous diverse, educational and fun events in which students of all years participated enthusiastically. The activities undertaken by each club for the months of July 2022-Dec 2022 are summarized below.

"*Clubs are the instruments through which one can find their hidden talent*"
On the auspicious Engineer's Day, the AECE began its new term by inaugurating the club activities for the academic year 2022-2023.

The gathering was addressed by Dr. Vijayalakshmi who gave wonderful insights into various upcoming activities of the clubs under the department and also welcomed our chief guest, Mr. E. Lokesh Kumar (Executive Electrical Engineer, BSNL Chennai) who enlightened us on where India stands in terms of technological advancements in the field of communication, Data Centre Business, and on his latest successful project on Andaman-Chennai High-Speed OFC Sea Cable Connectivity. The event ended on a high note with the introduction of the office bearers.

AECE

TESLA '22:

Tesla '22 the Annual Inter-Department Techfest conducted by the Department of Electronics and Communication Engineering and was held on the 29th of September 2022.
As a part of Tesla, the AECE held the following technical and non-technical events :

• *Play Your Ace:*

A fun technical event with a twist of your luck. Playing teams would choose to solve problems from a set of domains allotted based on their luck.

• *Mock Interview:*

This event was conducted in collaboration with all three clubs of ECE. Trial interviews were conducted to simulate the ongoing scenario of placements which benefited the participants with an understanding of the interview process on par with the current industry trends. Core, IT and managerial interviews were simulated.

INVENTE '22:

Invente '22 is the national-level inter-college technical fest of SSN and is planned to be conducted on the 1st and 2nd of December for which the department of electronics and communication has come up with 11 exotic events, a combination of technical, semi-technical and non-technical events under the theme - 'Advancements Of Space Technology. Various events associated with INVENTE'22 are:

- **Paper Presentation**
A technical event that scrutinizes your exotic research ideas in a forum consisting of seasoned academic professionals. Domains: Antenna Systems and Applications, Augmented and Virtual Reality, Cognitive Sciences, Cyber Security, Deep Learning, Photonics, Intelligent IoT, Machine Learning and AI, MEMS, VLSI, Blockchain Technology, Optical Communication Networks, Signal and Image Processing, and Robotics.

- **Hexathlon**
A technical event that makes one fight through the winds by answering and accomplishing tasks and proving your stance in 6 domains- Electronics circuits, Circuit analysis, digital system design, internet of things, control systems, and python.

- **Data Utopia**
A technical event that enables your power in this galaxy with your insights on data analysis and its interconnection with probability and statistics.

- **Make A Thon**
A technical code marathon that gives the opportunity to code and bid your questions at the auction.

- **Pitch It Please**
A semi-technical event that lets you master your marketing skills to clear domain-oriented marketing problems and quizzes and lastly pitch your products using only your wits.

- **Enigma**
A semi-technical event that embraces the art of solving puzzles and questions based on logic, aptitude, science and tech like a pro.

- **Solder It**

A technical event that enables one to decrypt problem statements and solder the chips correctly for the connections to spell right. The event spans two rounds that hope to test participants' theoretical and practical knowledge of circuits and devices in turn.
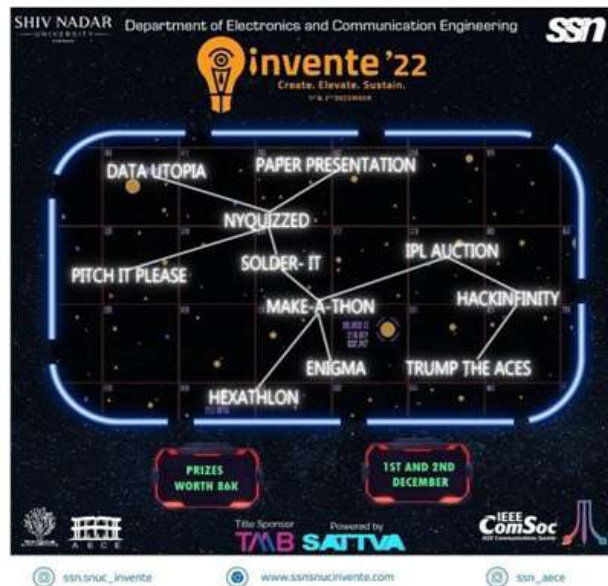
- **NyQuizzed**

A nontechnical event that aims to bring out the quizzer in an individual which follows the international quizzing format of pounce and bounce.

- **IPL Auction**

A nontechnical event that channelizes your inner Game Theory superpowers and bids the best in the relevant setting of IPL bidding.

- **Trump the Aces**

Witness cards from the deck rewrite your luck in three rounds of the event. A combo of quiz, completion and simulation of circuit.

Invente '22 which was originally supposed to take place on Nov 3&4 was postponed to be held on December 1&2.

SSN IEEE ComSoc

• *Circuities*

Circuities was conducted by IEEE ComSoc as a part of TESLA, ECE department's intra-college Techfest. It was an event based on basic concepts of electronics, that consisted of two rounds. Students participated in teams of two or three.

The first round was a pen-paper MCQ quiz round where participants were asked to answer 10 questions in 15 minutes on various subjects, including Digital System Design, Electronic Devices and Electronic Circuits.

Out of the 48 teams that participated, 8 teams qualified for the second round. The second round was a circuit design round wherein the teams had to design a circuit as per the given problem statement and then simulate it online on Falstad.

The teams were given 25 minutes to do so. The winners and runners-up were decided based on their cumulative scores in both rounds. The winners were from ECE department, and the runners-up were from the EEE department, and they won cash prizes of INR 1000 and INR 500 respectively.

•   *Scribble-It*

The SSN IEEE ComSoc conducted an event "SCRIBBLE IT" as a part of IEEE Day Celebration on 28th of October 2022. Around 20 teams with over 50 students across different departments participated in it. 2 rounds were held, followed by a tie breaker.

●   In Round 1, the participants were given 2 minutes to identify as many words as they could.
●   In Round 2, out of 20 teams, the top 5 teams were selected. The second round was timed for 1.5 mins and a deduction of 10 seconds from the total time for each word exchanged.
●   The final score was the sum of the first two rounds, where two teams had the same score. A tiebreaker was conducted, where both teams were given the same word to play identify. The first one to get the word wins, in a best of three.

During the period of 2 hours, the class was filled with joy and enthusiasm, the participants enjoyed themselves. Overall, the event was a grand success. The prizes worth INR 1500 were given to the winner and runner-up teams.

TECH CLUB

GENESIS: Chapter 01 & 02 ' - Membership drive for 3rd and 2nd years:

Date: 29th August, 2022 and 6th October, 2022

The Tech Club council met with juniors to introduce themselves and the club. A membership drive was conducted separately for the 3rd and 2nd-year students to join the club as volunteers. The students were briefed about Zenith and other exciting activities planned for them in the following academic year.

The response from the juniors was enthusiastic and overwhelming, with the majority of the participants from the ECE department.

Webinar on MITACS

Date: 9th September 2022

"Webinar On Mitacs" was an online interactive session conducted by Tech Club to provide insights into the application process of the MITACS Globalink Research Scholarship, a coveted internship program.

The Speaker for this talk was Kamya Hari, Domain head of Machine Learning, Tech Club, who was undergoing the internship at the time of the talk. She shared her experience so far and gave tips and tricks to crack the application process.

TESLA

Date: 29th September 2022

Tech Club organized 3 events as a part of this year's TESLA.

- *Treasure Hunt:*

Tech Club organized a college-wide treasure hunt event open for students from all years. This event received a lot of enthusiastic participation from the juniors. A total of 30 teams registered for this event. In the first round, participating teams were tested on their aptitude and logical skills along with their team work. For the second round, the number of participating teams were filtered to 12 and were given clues in the form of technical questions. Participants had to crack these clues to reach their final treasure.

Winners: Subhalakshmi, H Varsha, Sneha R

- *Sigma:*

Sigma is an IoT/ML workshop conducted by Tech Club. Participants were taught to implement Machine Learning algorithms using Edge Impulse, a development platform to implement ML solutions on edge devices. A total of 60 participants were present for this offline event.

- *Mock placement:*

The mock placement was conducted in conjunction with AECE and IEEE ComSoc. The participants were divided into three domains - core, management and coding. The first round of Mock placements involved testing basic aptitude. The second round was a technical interview, students were questioned on their resumes as well as asked to solve questions asked by interviewers live. The final round was an HR round, where students were asked about their expectations and were judged based on their attitude and enthusiasm to work in the company.

- R SAMYUKTHA
IVth, ECE-B
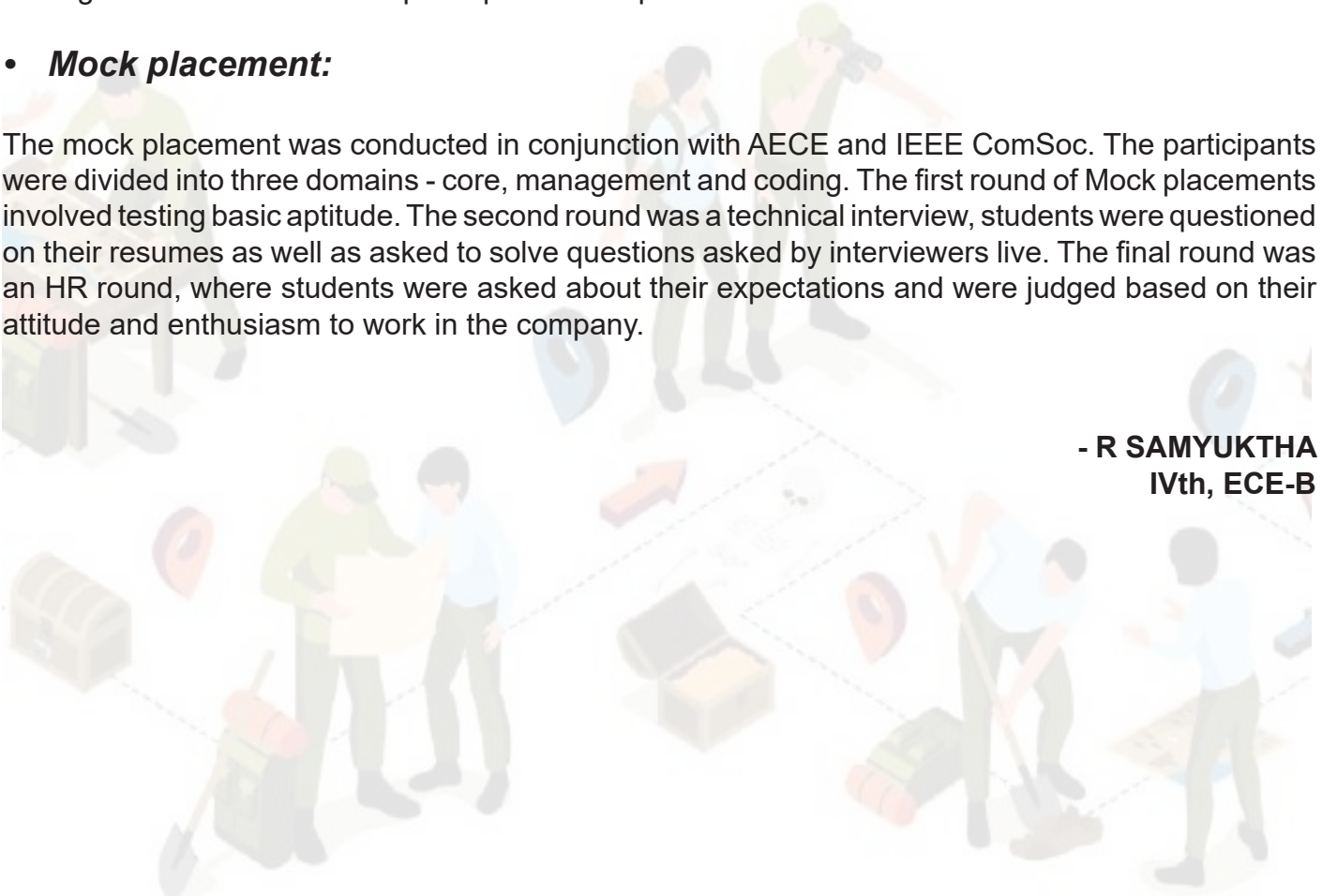
CARBON NANOTUBE FIELD EFFECT TRANSISTOR

The next Generation of FET's

Nanotechnology has taken the world by storm, revolutionizing our daily life in several aspects. The desire for fast, efficient, and minuscule systems has grown over the years and this has had a key role in electronic evolution. One such development in transistor nanotechnology is the Carbon Nanotube Field-Effect Transistor, also called the CNTFET.

What are Carbon Nanotubes?

Discovered by a Japanese physicist S.Iijima in 1991, a Carbon Nanotube (CNT) is a sheet of hexagonally arranged carbon atoms rolled up in a tube a few nanometres wide. The binding in a CNT is like that of graphene (a single layer of graphite). Carbon has 4 valence electrons: 3 are used for bonds with sp2 hybridization and there is a leftover p orbital perpendicular to the plane which can form weak π-bonds. Thus, the electrons in the p orbital are loosely bound, allowing the material to conduct. Based on the exact arrangement and the chirality of the carbon atoms in the CNT, it can either act like a metal or a semiconductor. This semiconducting property is what makes CNTFETs possible.

Review of MOSFETs

Metal-Oxide Semiconductor Field Effect transistor (MOSFET) is a four-terminal device with **Source (S), Drain (D), Gate (G)**, and body/substrate. The charge carriers flow from the source to drain through a channel. The width of the channel is controlled by the voltage on an electrode called Gate and this determines the conductivity of the device.

There are two modes of operation in MOSFETs:

▶ Depletion mode: The device is on at zero gate-source voltage (i.e., a gate-source voltage is needed to switch the device off)

▶ Enhancement mode: The device is off at zero gate-source voltage (i.e., a gate-source voltage is needed to switch the device on)

Therefore, MOSFETs can be classified as follows:

▶ P-Channel Depletion MOSFET
▶ P-Channel Enhancement MOSFET
▶ N-Channel Depletion MOSFET

P- Channel MOSFET   **N- Channel MOSFET**
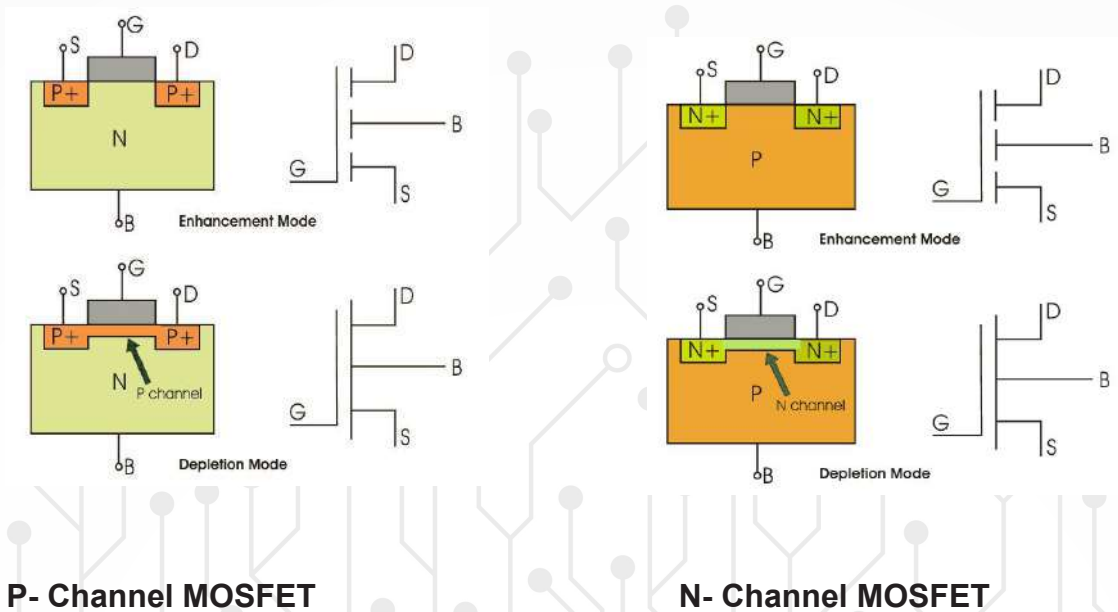
MOSFET structure and classification

MOSFETs are the most commonly found transistors in digital circuits. They can be used as amplifiers and passive circuit elements, and they can be used to regulate DC motors.

How does a CNTFET work?

CNTFETS are devices like MOSFETS in design and operation. One of the major differences between CNTFET and a MOSFET is that the channel is made of carbon nanotubes instead of silicon and the segment between the drain/source and the gate is heavily doped to provide low resistance. Based on operation, CNTFET can be classified as follows:

▶ Schottky Barrier (SB) CNTFET
▶ MOS-like CNTFET (also known as C-CNTFET)

SBCNTFET

The principle behind SBCNTFET is direct tunnelling through the Schottky barrier at the source-channel junction. The barrier width is controlled by gate voltage- therefore the transconductance of the device depends on the gate voltage. At low bias, a large barrier limits the current in the channel. As gate bias is increased, barrier width reduces, increasing quantum mechanical tunnelling through the barrier, which in turn increases current flow in the channel.

Early SB-CNTFETs have been typically p-type devices: the current carriers are holes, and the devices are considered ON for negative gate bias. N-type CNTFETs can be obtained by direct doping of the tube with an electropositive element or by a simple annealing process of p-type CNTFETs.
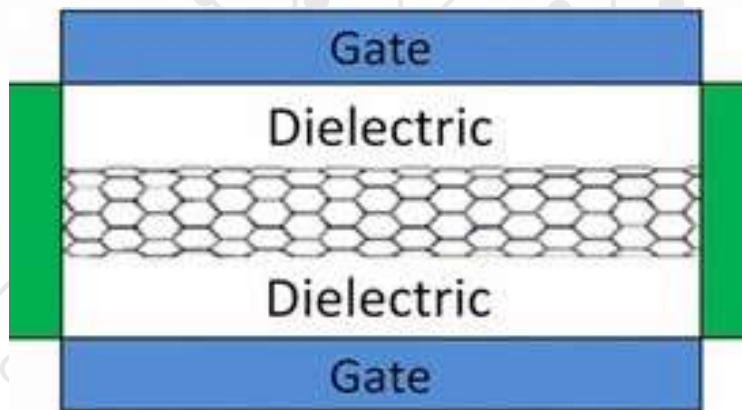
Model of SBCNTFET

C-CNTFET

In MOS-like CNTFETs, the source and drain are heavily doped semiconductors of p-type or n-type. These devices are denoted as conventional CNTFETs or C-CNTFETs. Its conduction behaviour is like a common MOSFET. When a positive voltage is applied between the drain and source ($V_{DS} > 0$ V), due to ballistic transport, the current is constant along CNT.

Compared to SBCNTFETs, C-CNTFETS have the following advantages:

▶ Faster due to unipolar characteristics
▶ Reduction in leakage current in the off state due to the absence of Schottky barrier
▶ Greater scalability
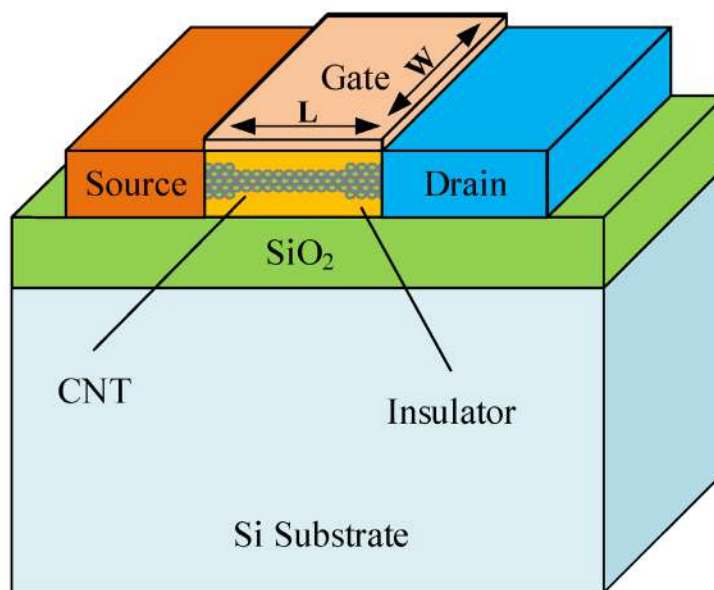
3D representation of a C-CNTFET

Why CNTFETs?

Current technology such as robotic systems, Artificial Intelligence, and embedded systems demand higher speeds, and much smaller sized ICs compared to what is being offered by existing devices. Silicon-based technology reaches its limits when devices are scaled down to nanometres. One major flaw of scaled silicon MOSFETs is the exponential increase in leakage current, which leads to high power consumption and reduced reliability. Since minimization of leakage current is essential in VLSI these days, CNTFETs and FinFETs are promising alternatives to traditional MOSFETs. However, CNTFETs are preferred to FinFETs due to the self-heating and heat dissipation problems in FinFETS.

Another factor to be considered is the stability of the device at higher temperatures. The MOSFET device characteristics and circuit behaviour change with the increase in temperature- the maximum tolerable operating temperature for silicon devices is around 150 °C. CNTs, however, are chemically inert due to strong covalent Carbon-Carbon bonds in the molecule. The effect of temperature on threshold voltage is negligible in CNTFET devices, therefore, they can be operated on a larger range of temperatures than MOSFET.

CNTFET is a rapidly developing technology- the outstanding electrical characteristics increase their possible applications in the semiconductor industry. In the future, all conventional transistors can be replaced with CNTFETs. One prospective application of these devices is DRAM memory cell design. It is expected that with the same power consumption, a speed three times more than that of silicon-based transistors can be achieved. In theory, CNTFETs have the potential to reach the terahertz regime when compared to standard semiconductor technologies. Nevertheless, this field is still at an early stage of development, and future applications are limitless.
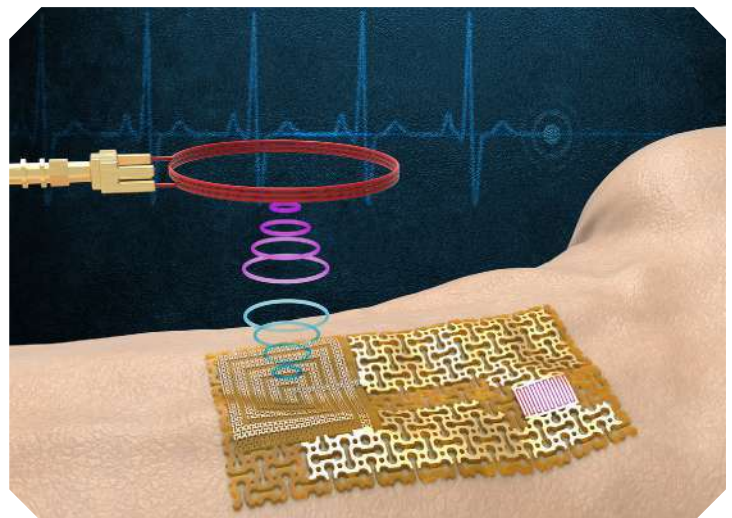
- Aditi Kannan

IIIrd, ECE-A

A CHIP-FREE, WIRELESS ELECTRONIC "SKIN"

The device senses and wirelessly transmits signals that are related to pulse, sweat, and ultraviolet exposure, without bulky chips or batteries.

Wearable sensors are ubiquitous, thanks to wireless technology that enables a person's glucose concentrations, blood pressure, heart rate, and activity levels to be transmitted seamlessly from sensor to smartphone for further analysis. Most wireless sensors today communicate via embedded Bluetooth chips that are themselves powered by small batteries. But these conventional chips and power sources will likely be too bulky for next generation sensors, which are taking on smaller, thinner, more flexible forms.

Now, engineers from MIT university have devised a new kind of wearable sensor that communicates wirelessly without requiring onboard chips or batteries. Their design, detailed today in the journal science, opens a path toward chip free wireless sensors. The team's sensor design is a form of electronic skin, or "e-skin" a flexible, semiconducting film that conforms to the skin like electronic Scotch tape. The heart of the sensor is an ultrathin, high quality film of gallium nitride, a material that is known for its piezoelectric properties, meaning that it can both produce an electrical signal in response to mechanical strain and vibrate in response to an electrical impulse.

The researchers found they could harness gallium nitride's two way piezoelectric properties and use the material simultaneously for both sensing and wireless communication. In their new study, the team produced pure, single crystalline samples of gallium nitride, which they paired with a conducting layer of gold to boost any incoming or outgoing electrical signal. They showed that the device was sensitive enough to vibrate in response to a person's heartbeat, as well as the salt in their sweat, and that the material's vibrations generated an electrical signal that could be read by a nearby receiver. In this way, the device was able to wirelessly transmit sensing information, without the need for a chip or battery.

Kim's co-authors include first author and former MIT postdoc Yeongin Kim, who is now an assistant professor at the University of Cincinnati; co-corresponding author Jiyeon Han of the Korean cosmetics company AMOREPACIFIC, which helped motivate the current work; members of the Kim Research Group at MIT; and other collaborators at the University of Virginia, Washington University in St. Louis, and multiple institutions across South Korea.

► **Pure resonance**

Researcher Jeehwan Kim's group had previously developed a technique, called as the remote epitaxy, that they have employed to quickly grow and peel away ultrathin, high quality semiconductors from wafers coated with graphene. Using this technique, fabrication and exploration of various flexible multielectronic films have been made possible.

In their new study, the engineers used the same technique to peel away ultrathin single crystalline films of gallium nitride, which in its pure, defect free form is a highly sensitive piezoelectric material. The team looked to use a pure film of gallium nitride to act as both a sensor and a wireless communicator of surface acoustic waves, which are essentially vibrations across the films. The patterns of these waves can indicate a person's heart rate, or even more subtly, the presence of certain compounds on the skin, such as salt in sweat. The researchers hypothesized that a gallium nitride-based sensor, adhered to the skin, would have its own inherent, "resonant" vibration or frequency that the piezoelectric material would simultaneously convert into an electrical signal, the frequency of which a wireless receiver could register. Any change to the skin's conditions, such as from an accelerated heart rate, would affect the sensor's mechanical vibrations, and the electrical signal that it automatically transmits to the receiver.

"If there is any change in the pulse, or chemicals in sweat, or even ultraviolet exposure to skin, all of this activity can change the pattern of surface acoustic waves on the gallium nitride film," notes Yeongin Kim. "And the sensitivity of our film is so high that it can detect these changes"

► **Wave transmission**

To test their idea, the researchers produced a thin film of pure, high quality gallium nitride and paired it with a layer of gold to boost the electrical signal. They deposited the gold in the pattern of repeating dumbbells a lattice like configuration that imparted some flexibility to the normally rigid metal. The gallium nitride and gold, which they consider to be a sample of electronic skin, measures just 250 nanometers thick about 100 times thinner than the width of a human hair.
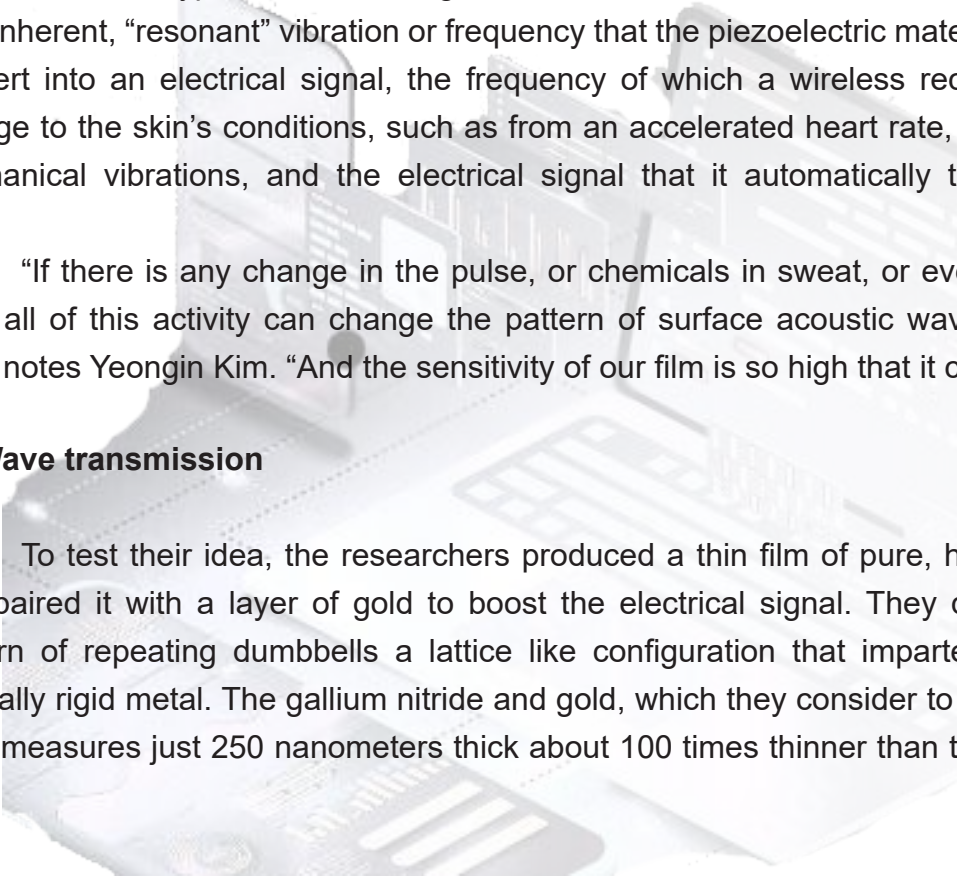
The team also paired the device with a thin ion sensing membrane a material that selectively attracts a target ion, and in this case, sodium. With this enhancement, the device could sense and wireless transmit changing sodium levels as a volunteer held onto a heat pad and began to sweat.

The researchers are seeing and considering their results to be their first step towards chip free wireless sensors, and they envision that there is a possibility that the current device could be paired with other selective membranes to monitor other vital biomarkers.

"*We have thus shown sodium sensing, but if you try changing the sensing membrane, you could detect any target biomarker, such as glucose, or cortisol related to stress levels,*" says co-author and MIT postdoc Jun Min Suh. "*It's quite a versatile platform.*"

This research was supported by AMOREPACIFIC.

- **Tarun V**
IInd, ECE-B
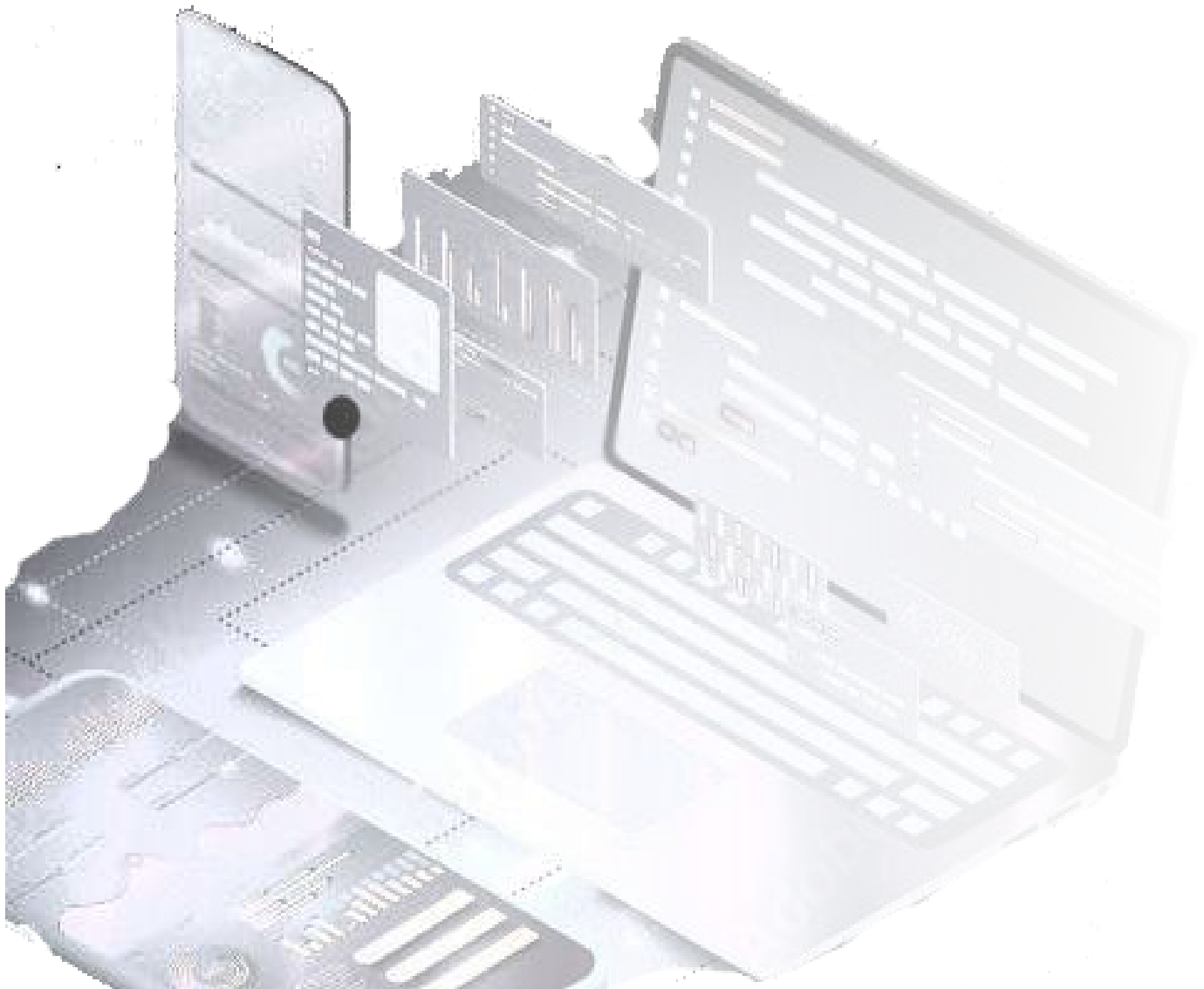
SMART INDIA HACKATHON

Smart India Hackathon is a National Level Hackathon organized by the Government of India. It is an initiative to provide students with a platform to come up with solutions to solve real-world problems. Our college has a reputation for being among the finalists almost every year. It was the same this year, as 2 final-year students from our department Krishi Divya Dharshini and Manjunathan along with some more students from the Department of Biomedical Engineering emerged as winners.

They worked on the problem statement, IoT based solution for recording and storing metrics of normal and orthotic leg for analysis by Orthotist.

The motivation behind choosing this problem statement is Manjunathan's mother. She faced a polio attack when she was 3 years old, rendering her handicapped ever since. Having seen a person struggle with the same gave them the motivation to choose this problem statement.

The selection process this year was a little different from the usual process. Initially, an Internal Hackathon was conducted where teams were asked to present their ideas. The teams with the best ideas were shortlisted. After this, the submissions were sent to the SIH organizing committee where it went through 3 levels of scrutiny. Ultimately, the final shortlists were released.

Both Krishi and Manjunathan stated that choosing the right teammates and mentors plays a crucial role, as teamwork is very integral in such competitions. They stressed the importance of comfort among team members, and everyone should be versatile and ready to adapt. The willingness to learn is also very crucial.

The 6-month journey, as expected, wasn't a cakewalk for them. Everyone on the team had certain strengths and weaknesses and unfortunately, there was no one on the team who had in-depth knowledge regarding IoT cloud. Given the fact that their problem statement is based on the Internet of Things, this became a problem for them. However, Manjunathan found an AWS (Amazon Web Services) course which helped them immensely. The real challenge was during the 5 days of the Hackathon. The huge amount of peer pressure, working in a closed environment and exposure to work of the other teams was getting to them. But they dealt with it positively and were successful in the end.

The vibe during the hackathon plays an important role. They went to Coimbatore a day earlier to get acquainted with the environment. The fact that they had to present their 6 months of hard work in 5 days was the biggest challenge. Their first goal was to get shortlisted, and they made sure they gave their best. Having such a mindset rather than expecting to win, is very important. The organizers also played their part by organizing yoga sessions, cultural programs and karaoke nights during the 5 days immensely helping the participants to vent out and relax.

Ultimately, the goal is to learn, give the best and not forget to enjoy!

On the last day of the hackathon, the mood was slightly different. They had a pessimistic mindset and were on the verge of giving up after the final presentation. But one thing that boosted them was the fact that the other teams had a good impression of their work. Both of them mentioned that the winning moment was euphoric and unforgettable. The first thing they did after they won was to share the news back home with all the other professors.

Krishi and Manjunathan are working on improvising the model. They are currently working on converting the prototype into the product. Simultaneously, the website preparation is also going on. They are aiming to mobilize it in order to help people. Once this is done, they are planning to come up with other ideas as well, in order to bridge the gap between the biomedical and the biomechanical markets by converting theories and ideas into practical applications. They stated that this is a continuous learning process.

Their advice to future aspirants is that first and foremost selection of a proper team. There should be a compromise between comfort and adaptability. Everyone should have a proper mindset and should be open to learning. Krishi also suggested that taking part in smaller hackathons would really help. People are interested in how one markets their idea or product rather than the science behind it. This is something in which everyone gets stuck, hence such preparatory hackathons are very helpful. Our department college conducts various Hackathons which enable students to venture out and learn. Hackinfinity, our department's flagship event, is a great avenue to take part in.

The bottom line is that hard work, constant motivation and an optimistic attitude will always help you attain your goals! Congratulations Krishi and Manjunathan on winning SIH and making our department and college proud!

- Kruthi R
IVth, ECE-A

PLACEMENTS 101

Harish Muthukaruppan, Geethika, Shweatha and Varshini are the current Student Placement Coordinators (SPC) of final year. The role of SPCs is crucial during the placement season. They act as a bridge between the CDC and the students. Any placement related information is circulated to the students through the SPCs. If students have any placement related queries, they can be cleared through the SPCs. In this article, they have shared all that students need to know about placements, tips for preparation, etc.

When….
The placement drives usually start in the 6th semester with few companies completing their selection process before the end semester exams. The placement will start in full swing once the placement training is over.

Pre placement talks:

During placement drives any company will first conduct a Pre-Placement Talk (PPT) which gives general information about the company, milestones the company has achieved in the past years, job position the company is currently offering, salary break up, bond details, etc. Students can clarify all their doubts during this pre-placement talk. It is important to attend the PPTs because sometimes questions in interviews may be asked from what was shared in the PPT. The PPTs also give some useful pointers on what to expect during the selection processes.

Selection process:

In general, any company that is recruiting for technical roles will conduct 3 types of rounds – aptitude/coding tests, technical interview and HR interview. The number of technical rounds varies from company to company. In case of management roles, the companies basically focus on management related questions like giving a case study and asking to provide a solution, aptitude tests, etc. Some companies do resume shortlisting even before conducting the aptitude/coding tests. So have a proper resume template and include relevant details. Keep the resume fair and square and do not include unnecessary information like too many details about your hobbies, personal information, etc. It is not like you should have long lists of projects in your resume. Even if you have done 3 to 4 projects, make sure you know everything about them from scratch.

How students are expected to prepare and present themselves?

In prior to appearing for the interview it is very important that they know about the company. One should be attentive during the PPTs. Any doubts about the company or the role can be cleared by direct interaction with the company people in such talks. On the day of the interview, students are expected to appear in formals. Students are expected to carry at least 2 copies of their resume with photos and other necessary documents as mentioned by the company. Candidates should be calm and should maintain discipline at the venue until their turn comes. If it is an online interview, it is necessary that candidates join the online meet punctually.

What feedbacks companies have given?

Some companies highly encourage certifications and skills in domains like cloud computing, Microsoft Azure etc. Some companies give a hike in your CTC based on certified skills the candidates have. Knowing and having certifications in foreign languages like French also proves advantageous. When it comes to IT companies which offer SDE roles, they prefer candidates who know java. This sometimes can be a problem for ECE students as we don't have Java anywhere in our course. But a very strong

foundation in coding, in any language may also impress the interviewer. So, it is necessary that students keep their coding concepts revised and thorough. When it comes to core companies, basic knowledge in the domains we have as courses in our college is expected. So, concepts should be revised.

**How many days the process takes place on an average?**

Placement processes are different for different companies. On an average a company comes back in a week after its preplacement talk and conducts online test. The shortlisted students are then called for either 2 technical interviews or a GD (Group Discussion) and 1 interview plus a HR Round. Companies are always happy with SSN students but few companies feel students are not so technically strong. In the placement process students would be nervous and companies would be excited CDC with SPCs taking up the responsibility to handle student's fear and company's excitement. CDC will share the tentative schedule every month for the process so they would be prepared. some selection processes may go on till evening and night at times. If companies mention it earlier, they'll make necessary arrangements for food transport.

Tips for preparation....

☑ **Solve aptitude question**

☑ **Practice coding especially in cpp, python and Java languages**

☑ **Practise mock interviews**

☑ **Be strong in the fundamentals**

☑ **Talk to seniors and ask for tips**

**Student Placement Coordinators,
Final Year, ECE**
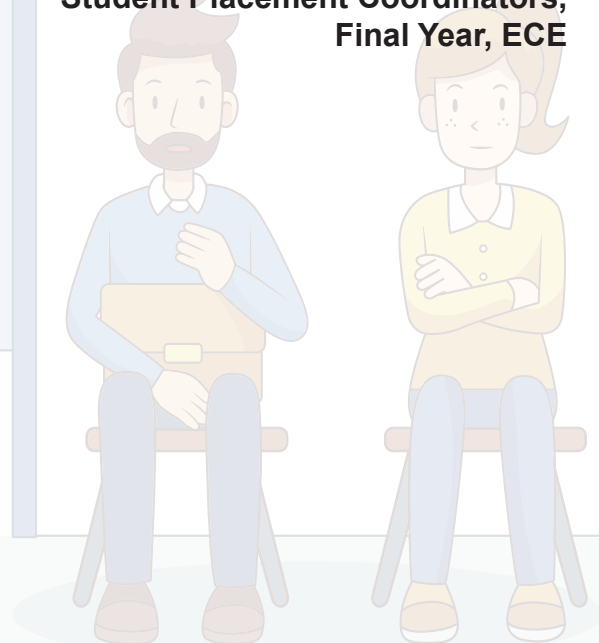
SILICON LABS

Sreeharine Govindaraj, a final-year student from our department has bagged a Marquee offer from a core company, Silicon Labs! She graciously agreed to share her interview experience in this article, read on to know more!

» What is Silicon Labs? What was the eligibility to take part in the placement process?
Silicon Laboratories, Inc. is a fabless global technology company that designs and manufactures semiconductors, other silicon devices and software. Their main focus is currently on the growing IoT industry. This year, they hired for the Hardware Designer role. Only students of the ECE Department were eligible to attend the process and were required to have a CGPA of 7.5 or higher throughout academics.

» Can you describe the interview process in detail?

The hiring process included four stages.
◇ The first one was a preliminary test - the questions were mostly on Basic Aptitude, VLSI and Digital System Design.

◇ Both the second and third rounds were technical interviews. The interview tested the candidate's VLSI fundamentals, Verilog coding and DSD fundamentals. The interview process for this round was highly dependent on the candidate's resume, skills and interests. To clear this round youneed to truly understand fundamental concepts and what they really mean, instead of just knowing the definitions and formulas.

◇ Finally, the fourth round was an interaction with the HR manager. Here, the interviewer just tried to understand the candidate's state of mind, and whether they will fit into the company. Discussions about how the candidate approached various problems and planned the projects mentioned in the resume occurred.

» How do projects and courses make one's profile stand out during the interview process?

It is definitely required that one has worked on hardware projects related to IoT, embedded systems, or even VLSI. Make sure you emphasize the contributions you made to the projects and the knowledge and experience you gained from them. It is also necessary to have a solid understanding of Verilog. Adding courses related to DSD, VLSI, Verilog, IoT, and fabrication of sensors would be great for your resume. Show them you are capable of learning and mastering it before you begin the job/internship if they expect more from you. Participating in hackathons and other achievements will definitely make you stand out from other candidates.

» What are some basic things that should be kept in mind by students who are preparing for placements?

It is important to brush up on your fundamentals. Recruiters always look at the strength of your fundamentals. Even if you face complex questions, you should be strong with your basics and they will judge you based on your approach. Some may know complex concepts and may be involved in research-level projects but might be weak in fundamentals. Thus, it is important to keep your basics strong. Make sure you know everything about the projects you are involved in and your contributions to the projects, hackathons, etc. Questions may majorly only revolve around your projects in the technical rounds.

Be confident. If you don't know any concept, it is acceptable - be open to challenges, learn new things and grasp new concepts on the go. Keep testing and questioning yourself, and never be satisfied with your current knowledge. Explore your strengths and weaknesses. Good luck!

- Shrinidhi Seenivasan
IIIrd, ECE-B
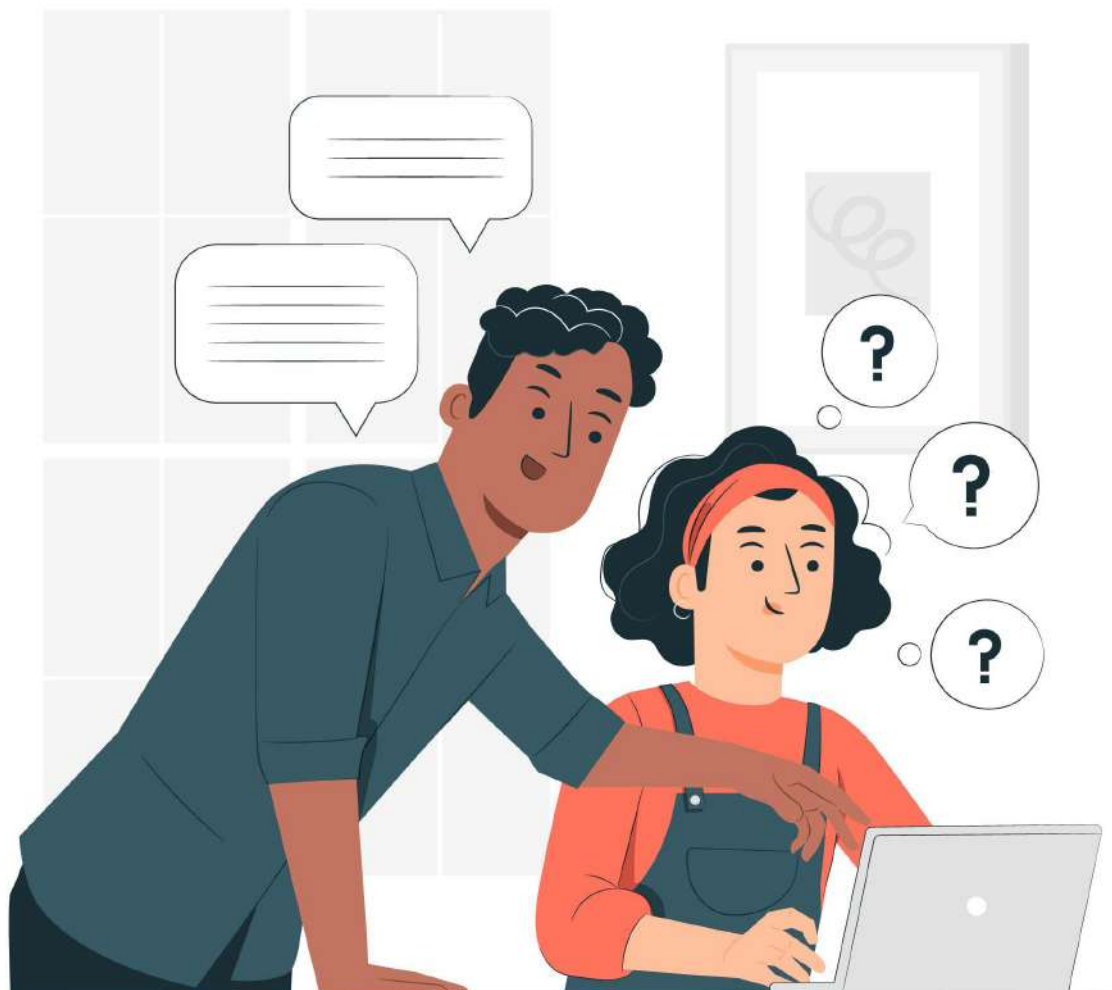
GOLDMAN SACHS

This article is on Sandhya's internship experience at Goldman Sachs, Bangalore who is a senior year ECE undergrad. She interned this summer for a period of 8 weeks from May 2022 to July 2022. And currently, and has been offered a PPO (Pre-Placement Offer) by GS for her performance during the internship.

❒ **What sort of company is Goldman Sachs and what do they do (/specialize in)?**

As we all know, Goldman Sachs is an American multinational investment bank and financial services company. It is a fortune 500 company and the most sought-after company. An engineer at Goldman Sachs gets to build massively scalable software & systems, architect low latency infrastructure solutions, proactively guard against cyber-attacks, and leverage machine learning to continuously turn data into action. They get to solve the client's most challenging and pressing engineering problems using the latest technology stack.

❒ **What are the eligibility criteria, as in what types of domains does one need specialization in?**

To secure a summer internship at GS, the candidate must be a pre-final year undergraduate student in a college or university. For full-time roles, the candidate must be in their final year of college/university studies.

❒ **Does CGPA matter?**

As per my knowledge CPGA does matter to clear the first level of screening. My peers and I had a CGPA of 9 and above. After that, the selection is purely based on our test and interview scores.

❒ **How do you find an internship (where to surf/contacts..)?**

I got the information regarding the summer internship from our college's placement cell. Then I had to fill out an application form available on their website. Students can also have an eye on GS's official website for any information regarding internship and full-time opportunities
.

❒ **How did your profile stand out from others? (or) What does a resume of a potential candidate for GS look like?**

An ideal profile would contain relevant coursework and projects in the software development domain. Apart from these, having an additional two to three ongoing or completed projects would suffice. Holding any position or playing a role in any club activities would be an added advantage.

What is the Selection process like for the Goldman Sachs internship program?

- Candidates submit their application in the GS portal under Engineering Campus Hiring Program. Registered candidates take up 90 minutes long Aptitude assessment hosted on Hacker Rank.
- At a broad level, the Aptitude test has the following sections: Numerical computations & reasoning, logical reasoning, abstract reasoning and comprehension. (Speed and accuracy were of utmost importance)
- Candidates who clear the aptitude test take up a technical test which at a high level covers Programming, Quantitative Aptitude, Computer Science, Advanced Programming and 2 essay questions to understand the candidate's thought process.
- The programming section would test the problem-solving skills and ability to program in either Python, C++ or Java. To prepare for that, easy and medium-level programming questions can be practised in any online coding environment.
- The final rounds of interviews would be conducted with those who qualify for the technical test, and the whole process was interesting and enjoyable.

How many rounds of interviews were conducted, and how did you prepare for each round?

They conducted 3 rounds of interviews, which consisted of 2 rounds of technical interviews and 1 HR round. In all three rounds, questions were asked about the projects mentioned in the resume.

In the technical rounds, I was asked to solve a DSA coding problem (medium level) on an online coding tool. The interviewers did not look for the correct answer instead, they evaluated my thought process for finding a solution.

In the HR round, I was asked to come up with a logic to solve a twisted Sudoku puzzle and then I was asked 3-4 scenario-based questions to understand my thought process.

Preparation: Revised the basics of Data Structures and Algorithms, went through the previous year's questions and solved a few of them
Quick Tip: GS is known for asking puzzle-based questions, so focus more on that.

After getting selected as a GS Intern what did you work on?

During the period of my internship, I got to work on an interesting and pressing problem faced by clients. To solve the problem, I got to add a cool feature in the pre-existing application system using the latest tech stack such as Spring-boot and React.
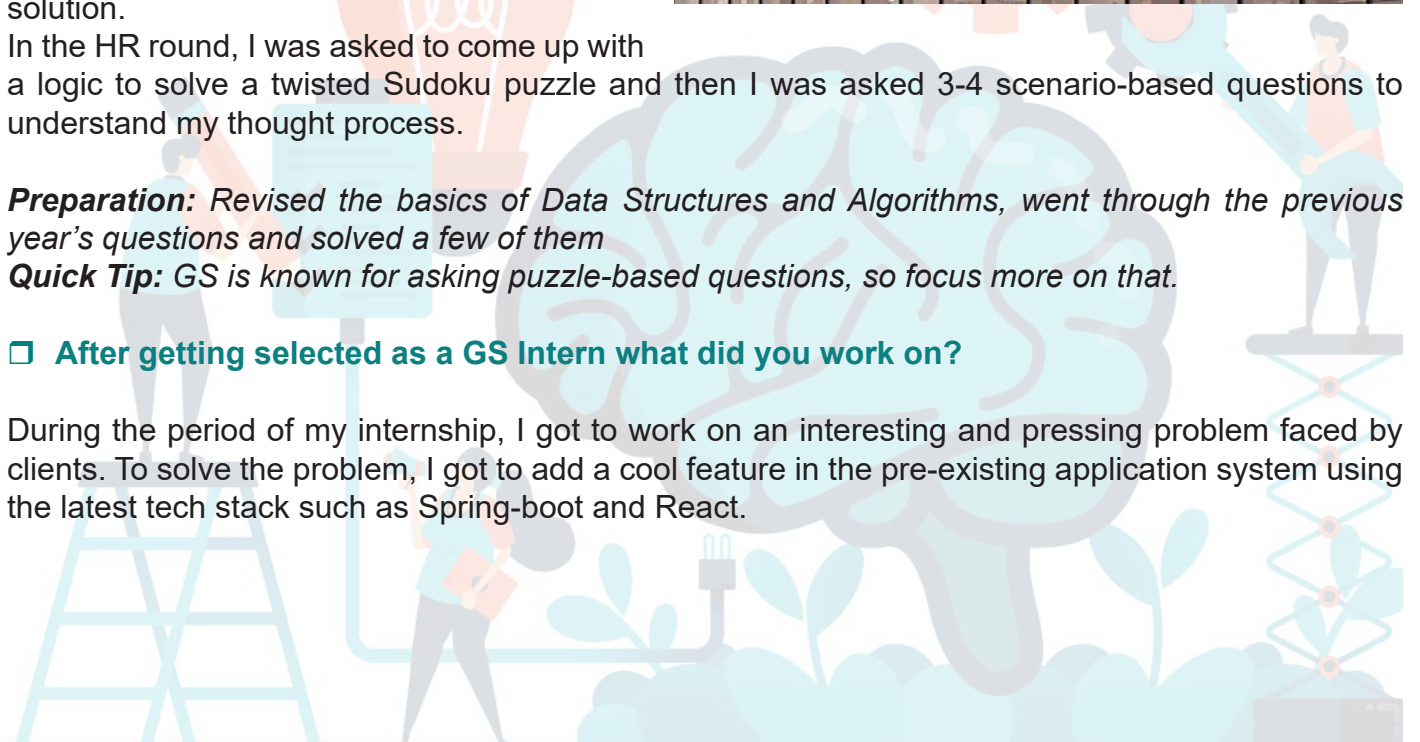
❏ **Your overall experience in the company (also any meaningful insights that you gained from interning here).**

Throughout the period of the internship, I got the opportunity to work on real responsibilities alongside fellow interns and other professionals.
Apart from that, we had orientation sessions to learn about the culture of the organization as well as to gain knowledge about the financial sector. I would say all the interns gained a real insight into the corporate world along with learning a whole new tech stack.

❏ **Any word of advice that you would like to share with us?**

Referring to the previous year's test and interview questions works like magic. It helps you understand the questions' pattern and what's expected from the recruiters. One more tip to crack their HR round is to have a piece of adequate knowledge about the company and their core values.

❏ **Any closing remarks?**

I would like to thank the Placement cell, all the faculty members, HoD and the GS team for making my internship process seamless and highly enriching.

- Manushresth M
IInd, ECE-A

THOROGOOD

We as college students are asked the dreaded question - 'did you get placed?' once the placement season starts and the whole thing is pretty nerve-racking. The ordeal can be difficult to navigate through and it helps when we have a roadmap to guide us. I had a conversation with Eshwar, fourth-year ECE who has been placed in Thorogood Associates.

Thorogood is an independent consultancy specializing in data and analytics. They help some of the world's largest companies to manage their complex businesses and gain a competitive advantage through the application of digital technology. They also have a longstanding track record of delivery and added value has secured an enviable list of blue-chip clients, with a challenging work environment that attracts the very best talent. Here are a few excerpts from the interview:

>>**What kind of resume do you think one should have?**

In general, I feel like having a good set of projects is very essential. It should be concise and easy to read and when people look at it, it should reflect on who you are academically. It also helps to have extra-curricular activities on your resume. Since a resume is not one size fit all, when it comes to an interview it's important to see what the company's requirements are and alter it.

>>**How many interview rounds did you have?**

First round was like an aptitude test. The second round was like a face-to-face interview. The third round was like a long one-day whole process which consisted of four parts. So totally three rounds.

>>**Can you describe the one-day long process?**

Usually, it happens offline on their campus but I had it online. After the face-to-face interview, eight of us from different colleges and companies sat together for the final round. It consisted of 4 sub rounds. The first round was like a case study, where you'll be put forth a question and a set of data will be given. With the help of the information given to you, you'll have to come up with an answer in a span of around 3 to 4 hours. We were basically connected to a virtual machine and had to put forth our points there and tell them which company was best suited for the given scenario. When this was happening, people were simultaneously being called for the second round which was fact finding. Here also you'll be given a situation, but you won't be given the details and you'll have to ask the right details to the panelists and arrive at a conclusion. For example I'm a part of college's solution finding task force and the college wants to organize the student's alumnus get together and

The third round was after a small break. It was a group discussion. This was unlike most group discussions where we are given a topic and we have to put forth points. Here we had to work in a team and solve a set of problems. We were given a set of 6 to 7 problems which a normal company will face and we were asked to solve all problems according to priority and it tested our ability to work as a part of a team. The last round was a HR round.

>>How did you prepare for the interview?

The one thing I did was look up different case study videos on Youtube. That was pretty much all the preparation that I did. I couldn't really prepare for the other rounds as it is completely dependent on how you think at that moment.

>>What kind of projects did you have?

I am currently doing an IFP. Additionally, I had two mini projects that I did as a part of the machine learning course and IOT lab. Apart from this I'm also working on a small project in VLSI domain.

>>Any advice for your juniors?

I would suggest the current third years who're planning to sit for placements to start competitive programming and code everyday for at least an hour and you'll be able to do it. When the time comes and if you're not selected don't get very worried. Try to learn what you're doing wrong and if you have the chance try to ask the interviewer what you could improve on. My main advice is don't be disheartened when you see your fellow classmates get placed faster than you. Even if you're putting efforts you'll feel like they're not bearing any results. It'll be fine and you will get placed even if it's a little later than what you wanted.

- C Shanmukha Priya
IIIrd, ECE-B

THOROGOOD®

CITIBANK

Citigroup Inc. or Citi is an American multinational banking and financial services corporation with over 200 years of history in consumer and corporate investment banking, headquartered in New York City. Their mission is to serve as a trusted partner to the clients by responsibly providing financial services that enable growth and economic progress. Their primary responsibilities include protecting client assets, lending money, processing payments, and gaining access to capital markets.

Software development analyst, as the name suggests, is neither a full-fledged software development nor a software analyst role. It is a 2-year program that will begin with 6 weeks of in-class training program, where selected students will receive in-depth education covering the fundamentals of the Analyst role, including the Capital Markets, multiple programming languages, etc.

A software development analyst will create high-caliber, scalable software solutions. He/She will write code that complies with quality standards based on business needs, provide assistance during testing cycles and post-production deployment, will use the proper testing and debugging tools, as well as take part in peer coding reviews, to ensure error-free programming.

We interviewed Karthik S, Shwathi Ramanathan, Vinu Abinayaa and Riyanka Rajakumar, fourth-year ECE students who went through the interview process of Citi for the role of Software Development Analyst. Their insights are consolidated and presented as follows…

ABOUT THE ROUNDS

There were three rounds:
1. Online aptitude and coding test
2. Technical Interview
3. HR Interview
The first round had multiple-choice questions. The test was conducted in AMCAT (Aspiring Minds Computer Adaptive Test). Aptitude questions had questions from mathematical aptitude, verbal reasoning and logical reasoning. They were of easy to medium level of difficulty.
The coding part had two questions. They could be solved with C, C++, or Java only. Questions were different for everyone.

The second round took place on Zoom. Short-listed candidates were interviewed for around 45-50 minutes. Questions asked were based on the projects and courses mentioned in the resume. Questions on Python, Machine learning, C++, OOPS, algorithms and data structures were also asked. There were two interviewers who were calm and friendly which created a feel-good ambiance for the candidates thereby helping them answer with confidence.

The third round was an HR interview which lasted for 10-20 minutes. Here candidates were asked to introduce themselves and were asked about their strengths, weaknesses, and long and short-term goals.
"It seemed to appear like a formality, but it was actually a selection point where they observe your attitude and speaking skills for a workspace."-Shwathi Ramanathan

PREPARATION

Aptitude and coding tests require a lot of practice. Online platforms such as Geeks for Geeks, Hackerrank, Glassdoor and Youtube videos were of great help.

For interviews, it is very important that we have an in-depth knowledge of each and everything mentioned in the resume. Brushing up on concepts such as OOPS and data structures can be done by watching some videos or referring to books. Knowing SQL can be an added advantage.

"Websites like Geeks for Geeks and Glassdoor will provide you with a lot of interviews and written test experiences, please note that these are very important because there are high chances of these questions getting repeated."-Vinu Abinayaa

DIFFICULTIES FACED

"It is important to constantly be in touch with some form of coding practice, as it is hard to suddenly start anew. Also make sure to be familiar with at least two languages, because it helps to know more than one. For example in Citi, there was no python option for the online test, so it was helpful to have experience in other languages like C++ at that moment. Another difficulty I faced during the interview was not knowing what to answer when asked about "Other skills I may have that have not been mentioned in the resume", so a suggestion would be not to mention everything in the resume and mention only the main points needed for the role."

-Karthik S

"To be honest, as a normal final year who opted for placement, I also had fears and worries about getting placed into a good company, but I made sure and set my mind towards giving my utmost best by motivating myself with how far I have come across and the potential I can put forth to succeed, initial I didn't have an idea of where to start my placement prep and was confused, but I listed out the topics to be covered in both coding and aptitude aspect so that it will motivate me to cover each of them as much as I can. There was a major constraint of fewer days for placement prep as our semester exam ended very late due to corona delay etc. Therefore, I also had other company exams on my journey, but to be honest those exams were pushing factors to prepare myself better day by day. There was an internet problem during both of my online tests and interview, but I somehow managed to make it with the resources I have by keeping the motto to give my best irrespective of whatever it takes."

-Shwathi Ramanathan

"Preparing for any interview can be stressful. We will be worried about the results. And more importantly, there is no proper syllabus, we can be questioned about anything from the technological stack mentioned in the job description. The HR interview was slightly tricky and needed to be answered carefully."

-Vinu Abinayaa

"There is always that bout of nervousness before any interview and no one can stop that. The end result depends on how you calm those nerves and present your thoughts in a cohesive manner. I always used to self-doubt my technical abilities and was scared before the technical interview. I did not know what kind of questions to expect so tried to cram what I could before the interview. This part was pretty stressful. But at the end of the day it was not how correctly you answered the questions but how and the manner in which u go about the questions was observed. So even if you aren't sure about the answer, be honest."
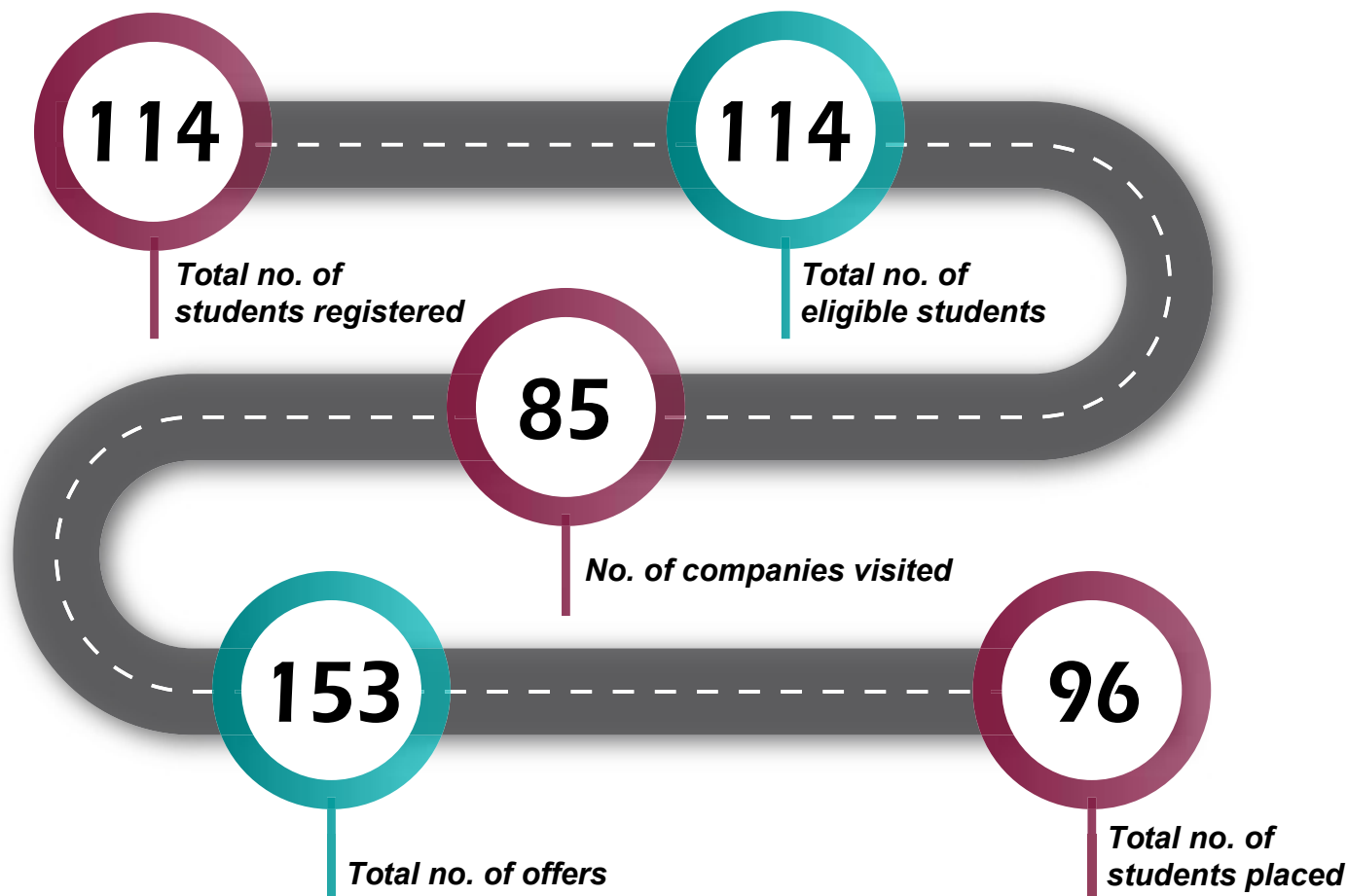
-Riyanka Rajakumar

SOME TIPS…

- ❑ Presentation of the resume matters. Be aware of everything mentioned in the resume. Don't bluff. Most of the time it's only the quality of the content in the resume and not the quantity, along with how well you are able to speak about it.
- ❑ Stick to answering to the point, and not providing extra information that the interviewer did not ask for, as it helps keep the interview short and concise.
- ❑ Read the job description thoroughly.
- ❑ Taking part in extracurricular activities and having done some good projects will boost your resume.
- ❑ Tell the interviewer whatever you know, if you don't know the answer please tell them you don't know and let them know the concepts you are strong at.
- ❑ Always have a positive mindset throughout the interview and never give up mid-way. Don't feel dejected if you don't know a few questions, it's normal not to know everything.
- ❑ And finally, DON'T STRESS OUT. Placements can be very stressful for each and everyone and it's normal to feel that way but don't let it affect your performance for the test/interviews.

**- Anusharaj S
IIIrd, ECE-A**

PLACEMENT REPORT

UG PLACEMENT REPORT

114
Total no. of
students registered

114
Total no. of
eligible students

85
No. of companies visited

153
Total no. of offers

96
Total no. of
students placed

PG PLACEMENT REPORT

Total no. of students registered: 11

Total no. of eligible students: 10

No. of companies visited: 47

Total no. of offers: 5

Total no. of students placed: 5

Total no. of internship offers: 3

MARQUEE AND SUPER DREAM COMPANY PLACEMENTS (UG)

Sreeharine Govindaraj
Silicon Lab
27.22 LPA

B Sandhya
Goldman Sachs
24.00 LPA

Vishal Ramprabhu
ShopUp
18.00 LPA

Afnan Naveed
CITI Bank
18.00 LPA

Karthik S
CITI Bank
18.00 LPA

Nethra Prakash K
CITI Bank
18.00 LPA

Riyanka Rajakumar
CITI Bank
18.00 LPA

Shwathi Ramanathan
CITI Bank
18.00 LPA

Vinu Abinayaa R
CITI Bank
18.00 LPA

Elakiya G
Optum
14.50 LPA

Geethika P
Optum
14.50 LPA

Jesline N
Optum
14.50 LPA

Keerthana R
Optum
14.50 LPA

Malepati Pranavi
Optum
14.50 LPA

Nandana R
Optum
14.50 LPA

Ramya V
Optum
14.50 LPA

Rangashri Venkataramanan
Optum
14.50 LPA

Rohit Dhandapani
Optum
14.50 LPA

K Gupta
Optum
14.50 LPA

Varshini G
Optum
14.50 LPA

Vignesh Sreenivasan
Optum
14.50 LPA

Eshwar Nevedh
Thorogood
14.15 LPA

Krishi Dharshini
Natwest Group
13.00 LPA

Simham TejSahan
Natwest Group
13.00 LPA

Deepakh Sharan D P
Fidelity
12.93 LPA

K Lalith
Fidelity
12.93 LPA

S Poojasree
Fidelity
12.93 LPA

Jebaroshan D
Eurofins
12.75 LPA

D Jaswanth
Comcast
12.00 LPA

Vikhas Vishnu Prasad
Amadeus
11.77 LPA

Krishna Dutt
Tekion
11.00 LPA

Srivatsan Suresh
Tekion
11.00 LPA

Vijayarahul S
Tekion
11.00 LPA

Abitha Shankar
Genpact
10.00 LPA

Akash P
Genpact
10.00 LPA

Akhil P
Genpact
10.00 LPA

Daphnie Rajkumar
Genpact
10.00 LPA

Ela Ezhilarasi
Mr. Cooper
10.00 LPA

Kishore Arumugam
Mr. Cooper
10.00 LPA

Lokesh T
Genpact
10.00 LPA

Pranav Narayan B
Genpact
10.00 LPA

Ramnath Karthikesan
LYNK Logistics
10.00 LPA

Santhosh Srinivas
Mr. Cooper
10.00 LPA

Voleti Sruthi Lakshmi
LYNK Logistics
10.00 LPA

Yeswanthraj S P
Genpact
10.00 LPA

MITACS GLOBALINK 2022

Mitacs is a non-profit organisation in Canada that funds many industries in the country to carry out various research projects in all domains. Out of the many activities that Mitacs carry out, the topic we are interested in would be the Mitacs Globalink Research Internship.

The Mitacs Globalink Research Internship is a prestigious program targeting third year undergraduate students and giving them the opportunity to work with different professors from universities all over Canada for 12 weeks and it is completely funded for the duration of the stay.

This year, Kamya Hari, a final year student from our department, just came back from Canada after completing her 12-week internship under this program. She went to the University of Winnipeg and worked with Professor Melanie Martin on the project "Multi Parametric MRI for multiple sclerosis." I had the chance to interview her, and she told me about the amazing experience she had-right from the application process to the end of her trip to Canada. So, let us jump into the questions where I share the same with you.

► **Tell us about your application process to the research internship**

Kamya: One of the greatest things about the Mitacs' application process would be the dedicated portal they have for the application to the internship. It is very organised and makes our lives much easier when we apply, making the process less confusing. So we must create an account in the portal there and fill in all our basic details. They ask whether we hold a passport but that is not mandatory for the application but of course required when selected for the program so I suggest you prepare for that. Once that is done, fill in a few short essays on your prior experiences, areas of interest, and your achievements. This is one of the most important sections which will help the professors, whose projects you are applying for, understand you better.

The next important section would be the selection of the projects. There are over 1000 projects available from all fields of study. Again, Mitacs has made it so much easier to select the projects by providing us with many filters and keywords to used to search for projects. Even then, this process would be one of the most frustrating parts of the application, extending even till the last minute since you would be spoilt for choices. After that would be the submission of your letter of recommendations and resume. Have your transcripts ready in advance. The maximum number of LORs are 2 and you should try to submit 2. But having one strong LOR is also sufficient as some of my friends have gotten in with the same.
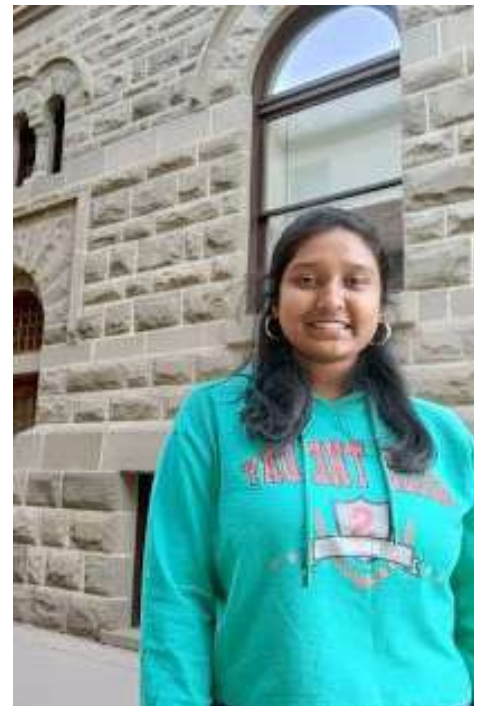
► **You mentioned the project selection part would be a little challenging. Could you elaborate more about that and give us tips and how to go about it?**

Kamya: Okay, so basically, we must choose a minimum of 3 projects and a maximum of 7 projects. Because of the large number of projects available even under a single domain of interest, the process could become a little overwhelming and confusing. Essentially, this is an iterative process. You should narrow down your choices by looking at several points, like how interesting the project is for you, the professor whom this project is under, the labs you would work in during the project. Based on all this, you could then decide on how suitable the project is for you and rank them accordingly.

► **After we have applied, what happens?**

Kamya: Well, we wait for quite a while. After a vetting process to check the eligibility of the application under some basic criteria, the applicants would be called in under three waves. The first wave usually starts in November where within a time the professors whose project you have applied for could call you for an interview if they would like or even test you in other ways–via a questionnaire, a short test, etc. This is completely up to the professor's discretion and they might even select you with none of the above. I had interviews with about 3 professors and 1 professor asked me to submit documentation from my previous projects. Also, the interviews were quite chill, with the professors being friendly. You can again change your ranking of projects based on your analysis of the process. The results would then be announced 2 to 3 weeks after each wave and the final wave would complete around February with a final detailed selection email being sent out to all selected candidates from all waves. After that comes a bunch of administrative work that would be tiring but would feel worthwhile when you land in Canada for the internship.

► **So, in your opinion, what do you think made you stand out and win you a spot in the internship?**

Kamya: I had a clear resume, which showed what I knew and what I had done prior, and strong LORs. Projects and courses played an important role here. But, more importantly, you just must do whatever you can and then craft a resume that reflects your capability and that would make the professors believe in you. Apart from that, I believe I did a good job during the interviews, just by being by myself and showing good communication skills and my interest in working with them.

► **After this huge process, you successfully got in and made it to Canada. So how was the trip?**

Kamya: The trip was academically and culturally enriching. My house mates at my accommodation came from all over the world. There were Chinese, Tunisian, and British people. I had many insightful conversations with them, which helped broaden my knowledge and look at the world with diverse perspectives. It was also academically insightful. Since my project was related to imaging, I had the chance to work with top class MRI Imaging equipment and learnt so much on the subject. I could experiment with live mice to learn about effect of the disease on tissue pathology.

The professors were helpful and guided me me step by step. They were always available and really validated me a lot, which helped boost my self-confidence and work harder. Mitacs also provides passes to various conferences, events, and competitions where I got to network and meet many fellow students and academicians from my domain of interest. I could even take part in a poster symposium "The Randy Kobes Symposium" conducted by the University where I was interning and won the first prize. The internship is really demanding and has a heavy workload, but the experience is truly unforgettable and it is a great learning experience.

► **And finally, do you have any tips for your juniors?**

Kamya: Be confident. Shoot your shot whenever you can and be prepared for everything. If you do not get in, do not worry, it is not the end of the world and there are many other doors to be opened. If you get in, then make the most out of it.

- Nivetha Elango
IIIrd, ECE-B

XYMA ANALYTICS

Rohit D from ECE, who is currently doing an internship in his final year has shared his experiences in the same, providing insights into navigating the core domain. If you can prove who you are in the domain you are interested in, then you can attain your goals. So here are excerpts from our conversation about his internship experience.

» **Tell us about your internship. Who is conducting this program and where?**

This internship was provided by Xyma analytics, which is in IIT Madras Research Park. In the course of our time there, we have gotten to work on sensor driven data for ultrasonic waveguides which have many applications related to environmental monitoring devices which monitor temperature, humidity and so on. By studying all these data, we will implement FPGA based Analog-to-Digital Converters.

» **How did you get this internship?**

I (along with another friend, Rohith Ram) got this internship offer through one of our seniors from Tech club, Niranjan who is now a project associate in IIT Madras, which we are grateful for. Having a senior contact might be helpful for your work or to get some insights from them. Do work in club works to get contacts and to gain some experience from this.

» **Can you share your experience in this internship?**

It is super good and going well so far. It is a 6-month internship, and this is our first month. They have their own programmer or in-charge type of person who we will work with. He will be there throughout this internship and we can contact him if we have any doubts or clarification. We are using Xilinx tool and there are Texas instrument ADCs in the facility to work with in our training. We learned how to use this equipment and it has been pretty interesting and fun to work on.

» **Is this internship you are doing related to your domain of interest?**

Yeah, I am interested in Digital Electronics and VLSI. My interest sparked through various gadgets I have been using all my life, like phones, laptops, etc. My foundation in electronics helped me learn more about it and increased my hunger to learn more. Then I got this opportunity to do this internship and I am excited to work on this. I feel lucky and want to do more in this field. Do have an interest in what you are doing!

» **What is the need for internships?**

Internships are important parts of our career, which are helpful both for our placements and for our masters. Comparing both, internships are more helpful for students who want to do masters, as they are directly linked to our core domain. Getting training and knowledge in the field that we want to do

masters is a vital part of our resume. Most universities will look into what areas you have been involved in during your college days and internships like this will have a direct influence in getting admissions too many reputed colleges. Also, they have a similar influence when it comes to core placements. So, if you get the opportunity to do an internship, don't hesitate. Grab the opportunity and train yourself well.

IITM Research Park

» Can you suggest your juniors how to get these kinds of internships?

I got this internship through my senior contact. But that's not all. One needs some basic knowledge about the field that you want to gain training. So always do some ground research and build your resume through various courses or tech talks. It will be more helpful to expand your knowledge. And talk to seniors working in the industry and other colleagues who will be more helpful to you in giving advice and guidance. You can get to know and network with your seniors and peers by involving yourself in clubs and events (like Tesla and INVENTE). So, participate and involve yourself in these kinds of activities which may help you in your future.

**- Abiisek M
IVth, ECE-A**

INDUSTRY INSIGHT

NETHRAA SIVAKUMAR, ADOBE

As a part of the content writing team of Impulse we got the opportunity to interview Miss. Nethraa Sivakumar, who graduated from SSN in 2022. She did her Undergrad specialisation in Electronics and Communication Engineering and now is currently working in Adobe as a Full time Developer. Adobe, is an American multinational computer software corporation headquartered in San Jose, California. Adobe focuses on developing and disseminating software for a variety of content types, including graphics, photography, illustration, animation, multimedia/video, motion pictures, and print. Adobe Photoshop, Adobe Illustrator vector-based illustration software, Adobe Acrobat Reader, are some of its flagship products.

As an Undergrad Nethraa was keenly interested in Mathematics, Machine Learning and Data Science. She says online courses which were available on Coursera, Udemy etc can act as a beginner kit to explore the above-mentioned domains, however it's very important to do projects to enhance practical knowledge. She did several projects during her under graduation which mainly focused on Machine Learning, Image and Signal processing and Natural Language Processing.

She applied for an internship at Adobe (SheCodes – Exclusive for female candidates) via college during her third year. The internship process had 3 rounds. The first round had questions based on basic aptitude, data Structures and coding. The first round was conducted in AMCAT platform, the second round had gamified assessments which made the hiring process at Adobe unique, The gamified assessments, test behaviour patterns, response time, attitude etc of the candidate. The third round was the interview round, she was questioned on the things she mentioned in her Resume. At that time, she had done only one project titled "Attribute-based Double Bounded Rough Neutrosophic Sets (DBRNS) in Facial Expression Detection" the project was mainly based on mathematics. The interviewer didn't discriminate the fact that she didn't belong to a coding background rather questioned her on her strengths and her projects. Intricate details from her project were questioned. Most of the questions were from Machine Learning and Engineering puzzles where the interviewer gave importance to the thought process rather than the final answer.

Nethraa strongly advices the juniors not to mention things that they aren't sure of in their resume. She was the only person from SSN who bagged the internship offer from Adobe as a Research Intern. She describes this internship period as hectic however she considers it as one of her greatest learning experiences. It was a three-month Internship. The first two weeks of the internship was assigned to choose a problem statement and to brainstorm ideas on how to solve the problem with their skillset. There were regular meetings where they had to update the managers on their progress. The research work mainly focused on NLP and a patent was filed for the same. The Internship was later converted into a pre placement offer.

Now she currently works as a full-time developer at Adobe in Bangalore. Her current role requires a skillset of Java, JavaScript etc. Even though she hadn't learnt much about them in her undergrad she utilized the extra time she had in her hands during her 8th semester of college as she waived her courses.

According to her she has no regrets working at Adobe as the company has great work life balance and there is no micromanaging among the employees, the employees are trusted by the managers.

On asking her what advice she will give her juniors, she says,"It's important to follow one's passion and not blindly follow others and their way of life."

- Nethra Prakash K
IVth, ECE-B

A Conversation with Andrea Solomon

Andrea Solomon graduated SSN College of Engineering in the year 2022 with a Bachelor's degree in Electronics and Communication Engineering. She currently works as a Software Engineer at Walmart Global Tech India. Walmart Global Tech has a long history of transforming retail and using technology to deliver innovations. Since their inception, they have been dedicated to bringing about customer delight and convenience, on a global scale. Walmart's technology first products and solutions cater to millions of customers' needs while saving them time and money. Here's an insight to Andrea's very own experiences as she talks about her life at SSN all the way to her career at Walmart Global Tech.

► Can you tell us about your role in Walmart Global Tech?

I currently work as a front-end developer in Walmart Global Tech's eCommerce division, so my work involves developing new features, writing functional/unit test cases, bug fixes etc. new features, writing functional/unit test cases, bug fixes etc.

► What is it like working in Walmart ?

The work here is very fast-paced, the developers are expected to take ownership of the tasks they're assigned, coordinate with the people involved and finish them on time. There's something to do every day, and absolutely no room for slacking. Retail and eCommerce are fantastic domains and I was truly mind-blown by the amount of work people do to keep the business going on a daily basis.

► Can you walk us through your off-campus placement experience?

Applying for jobs off campus gives you the freedom to choose which roles you apply to and at which companies, however getting those jobs is much more challenging than getting them on campus. That being said, there's no formula to cracking offers, but this is how I went about it: I was targeting software development-related roles and so I first focused on my fundamentals: coding, data structures,and learned the basics of OOPS and other computer science subjects interviewers focus on, besides working on a few web development projects .Next, I started looking for job opportunities, and for this LinkedIn was extremely helpful. There are many people who regularly post about hiring events, job vacancies and interview experiences. Following and connecting with the right set of people will make sure your feed is tailored to give you content about opportunities, and tidbits of information that helps build your skills and general knowledge.

Doing this really helped me, and is necessary for a platform like LinkedIn that has a lot of unnecessary content these days. I also joined a couple of Telegram groups to stay updated on the opportunities available.

Then came the applications. I applied to multiple companies but got the test link from very few. The online test format varies from company to company, but in general, there's a coding section, an aptitude section and a computer fundamentals section. In my experience, the interviews were comparatively easier to get through compared to the arduous process of getting the interview call itself. Companies in general have around 2-3 technical interviews along with an HR interview. Tech interviews can focus on anything: coding, computer fundamentals, questions about your projects, data structures, OOPS, coding languages you know, etc. It really depends on the company and to an extent your interviewer, so it is important to look up the interview structure in sites like geeksforgeeks, Leetcode etc, but only before the interview itself.

Managerial/HR interviews focus on your extracurriculars, and how you fit in with the company's core values. I had a couple of extracurricular activities, both in school and college to my name so talking about my experiences in those positions really helped. What worked in my case was starting the application process early and at the right time (companies start hiring from September and finish up the process by March/April), working consistently: a little bit every day, and after every rejection/failed interview or test experience understanding what I did right, what I struggled with and working on that before the next test/interview.

► Do you consider CGPA as a crucial factor while sitting for placements?

As much as we students hate to hear this, CGPA is a crucial factor in placements. CGPA is a filtering criterion in some companies: you could be the best at programming out there with a stellar profile but there are companies that will not even look at your resume if your CGPA is not above 7, and for certain other companies, the bar is 8. To be on the safe side, ensure your CGPA is above 8 throughout, it's an effort but it is worth it.

► Can you tell us about the projects you have worked on during your time at college?

In the first two years of college, I worked on projects using Raspberry Pi and Arduino, like the Line Follower Bot and Obstacle Avoidance Bot. For my final year project, I worked on the Localization and Segmentation of Brain Tumors using a YOLO v5 model and 3D UNet respectively. I worked on a few web development projects as well.

► What was the college-to-workplace transition like?

The main transition I felt was the amount of ownership suddenly thrust onto me in the workplace. In college, there aren't many consequences to what you accomplish and what you don't, the workplace isn't like that, you will be held accountable. At the same time, I felt there was a lot of learning to do, a lot of things I thought I knew but actually didn't. There are so many people, in so many different roles that it takes to keep a company like Walmart up and running, and it gave me a newfound respect for people who work in the corporate field.

► Do you find ECE and your time at SSN useful for your current job?

I chose Electronics out of interest, the field is continuously evolving and I continue to find that extremely fascinating. I'll always be forever grateful to all our professors for putting in the time and effort to instill

in us an interest in the field. My current job, unfortunately, requires a different technical skillset. I got my internship via seniors, so many of the people I've made friends with here have done very well in their own lanes, and one of the main reasons I was motivated to try my hand at off-campus placements,despite knowing how strenuous the whole process could be, was because I knew there were people like me from SSN who've done so before and yielded good results, and if they could do it, there was a good chance I could too.

► How important is coding in today's world?

In the beginning, coding scared me. There were too many things to think of for each coding problem and it took me a great deal of time to understand the logic. I stayed away from it for the longest time till I realized I had to get over it if I wanted to get through placements. Gaining proficiency in a coding language and mastering data structures, algorithms and finetuning my problem-solving skills on platforms like Leetcode and hackerrank took time and consistent effort, but it was one of the best things I did. It helped refine my thinking process, and currently, in my work, it helps me arrive at quick fixes, optimize code and write logic effortlessly. I believe this knowledge and skill will come in handy in whichever technical role you take up.

► What would be your advice for students who are trying to make the switch from core to software? What are the main things they have to keep in mind while applying?

Firstly, don't feel bad about it. Interests and priorities change and evolve, and it is not your fault for opting for a software job. Landing a job requires effort from anyone be it a CSE student or an ECE student, and it isn't easy. But consistent, focused effort will get you there. ECE students learn Python, OOPS and data structures (with C++), Communication networks, Computer Architecture and Microprocessors and Microcontrollers, the only subjects remaining that interviewers/online tests generally focus on are Operating Systems, and Database Management Systems. There are multiple online videos and resources where you can learn these subjects from.Focus on one coding language like Python or C++ and grind on Leetcode. It will be challenging initially, but solving problems and seeing test cases pass will give you a different level of satisfaction, and after a point, you might start to enjoy coding too. Build projects with what you learn, you will gain proficiency. At least one or two software-related projects are necessary on your profile if you're looking for a software role.

► Any advice for the current ECE batch? (Something you wish you knew when you were in their shoes.)

Feel free to reach out to professors/seniors/alumni on LinkedIn or anyone whose profile you find interesting really, you'll be surprised by how easy it is to connect and ask for mentorship/ guidance if necessary. They were once students too, and will definitely be willing to offer help or might even reach out to you if they have opportunities for you! Also, if you systematically approach your goal, any goal is attainable. Don't limit yourself and keep working hard, consistently. The sky's the limit!

- **Harini A**
IIIrd, ECE-A

INDUSTRY 4.0 : PREDICTIVE MAINTENANCE

Dr. R. Rajavel, Associate Professor
Department of Electronics and Communication Engineering

Dr. R. Rajavel, Associate Professor in the department of Electronics and Communication Engineering, has nineteen years of engineering experience including four years of research experience at National Institute of Technology, Calicut. He has published over 50 research publications in refereed International Journals and in proceeding of National and International conferences. He is a recognized supervisor of Anna University and two scholars have gotten their PhD under his guidance and currently four PhD research scholars are doing their research in the areas of Speech Signal Processing, Audio-Visual Speech Enhancement and Big Data. His areas of interest include Signal Processing, Image Processing and Speech Processing.

Survival of the fittest was no joke. Didn't we put in phones in place of cameras, calendars, calculators, and what not? Technology update is the new key to win the race of the forever running world. With technology taking a leap forward every single day, updating ourselves is the key to sharpen minds and be in the race. With this in mind, let us peep into the upcoming project which would build the future world around us.

1.Could you give us a brief introduction to Predictive Maintenance?

Generally, common maintenance of rotatory machines and their parts are done only when an issue occurs in its working. This is the conventional way and often leads to unexpected shutdowns and high maintenance costs. In order to avoid the same problem, preventive maintenance is used in which care is taken at regular time intervals. In this case, maintenance is done at times even without an issue/repair. This again increases maintenance cost and interrupts productivity, and in order to avoid the same, in Industry 4.0, Predictive Maintenance is used in which health of the machine is monitored using smart sensors where major variations in the parameters like temperature, vibration and sound, and maintenance is done only when there's a drop in these. This keeps the maintenance cost low and avoids catastrophic failures and ensures safety of labour and machinery too.

2. What are the basic principles that we relay on to make this work?

Constant health monitoring of critical parameters of the machine like vibrations, temperature and sound. If there are abrupt variations, maintenance will be scheduled.

3. What progress could we foresee in the upcoming 10 years?

• Sensors currently are wired. However, in the upcoming years, Smart sensors and IOT sensors would take over.
• Designing a custom communication network using LoRa WAN communication network in case of network failures.

4. What are the advantages of switching over to this technology?

• Increased safety
• Avoid catastrophic failures
• Reduced maintenance cost
• Affordability

5. What are the prerequisites that a student should posses to pursue research in the same field?

• Python and packing – for condition monitoring and dashboard development.
• Basic knowledge of machines.
• Basics of communication protocols.

6. What electives does our college provide us with to explore this field of research?

• IOT
• Python and basics

7. What motivated you to explore this technology?

Predictive Maintenance is the future of all industries, which is the major domain of Industry 4.0. It would be a new trend setter which uses the knowledge of AI, IOT, Machine Learning and Deep Learning. With the thirst for technology and these amazing concepts, I wanted to explore the same.

8. On an International scale, how feasible and affordable would this project be if implemented?

Existing sensors have softwares that are sold at expensive rates. However, this Predictive Maintenance setup is built on open source softwares and frameworks that are easy to access and affordable.

9. What are the drawbacks in switching over to the same?

Academic people have knowledge and technology, but to implement the same and process packing as a compact system, support from third parties is required. Marketing should join hands as well.

- Lakshana D.K
IInd, ECE-A

ON EXISTENTIAL CRISIS

I wake up, stare at the ceiling
Try to shake off this feeling
It sits still like a weight on my chest
It's hard to get up from my bed
There's a million thoughts in my head
But this one- it makes me freeze, falter, fall
'What's the point of it all?'
When I'm stuck in an unending routine
Running on low battery, a machine
With faulty parts. But I stand tall
And I'm running with them all
Towards something I'm not sure is real
Nothing more than a cog in the wheel.

Yet something gets to me to my feet
Because there's some things
That just make me feel complete
Maybe it's the thought of sunshine on my skin,
And that of the autumn chill,
Or even the rain that I hate to walk in.
Maybe it's the thought of a childhood friend
And those that'll smile at me, laugh with me, cry for me
Or even the ones I swore I'd hate till the end.
Maybe it's the thought of a good conversation
And of making a connection
With the most unexpected of strangers.
Maybe it's the comforting cliché
That I'm not the only one who feels this way
It's happened before, it'll happen again
Their time might have been different
But our thoughts belong to the same vein
So I'll do what they've all done
I'll write about it all and maybe, just maybe
In the days ahead, it'll soothe someone.

- Sriya Pavani V
IInd, ECE-B