EEE ASSOCIATION

TRONICALS

Vol 9
Issue 1

Cover Story:

SILICON DREAMS: INDIA'S GROWING SEMICONDUCTOR INDUSTRY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI

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Message from the H.O.D
Dr M P Selvan

I'm delighted to introduce the latest edition of Tronicals, our department's bi-annual newsletter, which showcases the remarkable achievements of our faculty and students in the field of Electrical and Electronics Engineering. Our department is one of the oldest departments of the institute and celebrating Diamond Jubilee this year. Our department has a rich history of teaching and research excellence and has recently seen a surge in postgraduate placements in core sectors, thanks to our exceptional education. Our faculty members have made significant contributions, resulting in multiple granted patents, and we've achieved an international QS subject ranking of 451-500. Dr. K. Sundareswaran, one of our distinguished professors, has been recognized as one of the top 2% scientists in the field of Electrical and Electronics Engineering by Stanford University. Notably, an undergraduate student has been offered an opportunity to pursue his fourth year of study at IIT Madras and will be offered direct Ph.D. admission based on his academic excellence. I applaud all contributors and the editorial team for their dedicated work on this edition. I hope you find it informative and enjoyable. Happy reading!

~ Dr. M.P. Selvan, HoD, EEE

Message from the Faculty Advisor
Dr. Josephine R. L.

Warm greetings to the EEE enthusiasts on behalf of the EEE Association (EEEA) and Tronicals. It's an honour to address you as the Faculty Advisor of EEE Association.

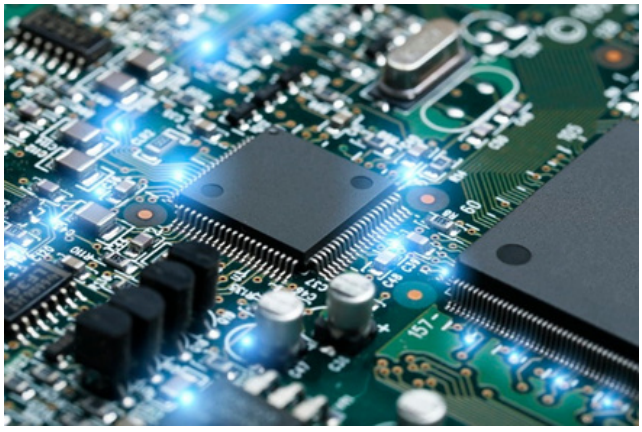
EEEA plays a pivotal role in enriching our department's activities by organizing technical workshops, events, guest lectures, and the annual technical symposium - Currents. The enthusiasm and participation from students from both within and beyond NIT Trichy has been remarkable. I commend the meticulous planning and unwavering spirit of the EEEA teams throughout the years and wish the incoming team a successful and prosperous year ahead.

Our primary focus at EEEA remains education. We firmly believe that education is the catalyst for change. Being at NIT Trichy and studying EEE is indeed a privilege, and we are committed to extending this privilege to others. Education equips us not only with knowledge but also with the invaluable opportunity to contribute to the administration, elevating our leadership qualities.

In addition to our educational endeavours, we have a wonderful opportunity to be part of the Social responsibility initiatives. "LIGHT UP", one such initiative conducted in the month of October, involves reaching out to tribal students and sharing the joy of education by offering them career guidance. Together, we can make a difference in our society.

The path we're embarking on is rooted in education, with branches spreading into service, volunteering, leadership, charity, and discipline. As we journey forward, let's anticipate and work towards great things ahead. ALL THE BEST.

~ Dr. Josephine R.L., Faculty Advisor, EEE-A



VISION AND MISSION OF THE DEPARTMENT

ABOUT:

The department of Electrical and Electronics Engineering, NIT Tiruchirappalli was started in 1964. It offers one Under-Graduate programme (B.Tech.), two Post-Graduate programmes (M.Tech. in Power Systems and M.Tech. Power Electronics) and also research programmes (M.S. and Ph.D.) in the various fields of Electrical and Electronics Engineering. After the institute became NIT, the department has grown not only in terms of student and faculty strength but also in improving the laboratory facilities for teaching and research purposes. The department is recognised for excellence in research, teaching and service to the profession.

The faculty members have a strong sense of responsibility to provide the finest possible education for both graduate and undergraduate students. The academic strength of the faculty is reflected by the alumni, many of whom are in the top echelons of industry and academia both in India and abroad.

VISION:

- To be a centre of excellence in Electrical Energy Systems.

MISSION:

- Empowering students and professionals with state-of-art
- knowledge and Technological skills.
- Enabling Industries to adopt effective solutions in Energy areas through research and consultancy.
- Evolving appropriate sustainable technologies for rural needs.

PROGRAMME EDUCATIONAL OBJECTIVES:

The major objectives of the B.Tech. programme in Electrical and Electronics Engineering are to prepare students:

- for graduate study in engineering.
- to work in research and development organizations.
- for employment in electrical power industries.
- to acquire job in electronic circuit design and fabrication industries.
- to work in IT and ITES industries.

PROGRAMME SPECIFIC OUTCOMES:

1. Apply fundamental knowledge of Electrical , Electronics and Computer Engineering concepts to understand, analyse and solve complex problems in Power Engineering and allied areas.
2. Analyze, design and develop Electronic circuits and systems
3. Adapt to the changing needs for self and continuous learning, communicate effectively and practise professional ethics for societal benefits.

PROGRAMME OUTCOMES:

The students who have undergone the B.Tech. programme in Electrical and Electronics Engineering (EEE):

- Will have an ability to apply knowledge of mathematics and science in EEE systems.
- Will have an ability to provide solutions for EEE problems by designing and conducting experiments, interpreting and analysing data, and reporting the results.

- will have comprehensive understanding of the entire range of electronic devices, analog and digital circuits with added state-of-art knowledge on advanced electronic systems.
- will have knowledge and exposure on different power electronic circuits and drives for industrial applications.
- will have in-depth knowledge in transmission and distribution systems, power system analysis and protection systems to pursue a career in the power sector.
- will have a good knowledge in microprocessors/microcontrollers, data structures, computer programming and simulation software.
- will be able to develop mathematical modelling, analysis and design of control systems and associated instrumentation for EEE.
- will be able to systematically carry out projects related to EEE.
- will have an ability to participate as members in various professional bodies as well as multidisciplinary design teams.
- will demonstrate the ability to choose and apply appropriate resource management techniques so as to optimally utilise the available resources.
- will be proficient in English language in both verbal and written forms which will enable them to compete globally.
- will have confidence to apply engineering solutions with professional, ethical and social responsibilities.
- will be able to excel in their professional endeavours through self-education.
- will be able to design and build renewable energy systems for developing clean energy and sustainable technologies.

PROGRAMME OUTCOME

M.TECH IN POWER SYSTEMS

PROGRAMME EDUCATIONAL OBJECTIVES:

The major objectives of the M.Tech. programme in Power Systems are to equip the students with adequate knowledge and skills in Power Systems Engineering and to prepare them for the following career options:

- research programmes in Power Systems Engineering.
- employment in power research and development organisations.
- to work in electric power industries and energy sectors.
- faculty positions in reputed institutions.

PROGRAMME OUTCOMES:

A student who has undergone M.Tech. programme in Power Systems (PS) will:

- have an ability to evaluate and analyse problems related to Power Systems and be able to synthesise the domain knowledge and incorporate the principles in the state of art systems for further enrichment.
- be able to critically investigate the prevailing complex PS scenarios and arrive at possible solutions independently, by applying the acquired theoretical and practical knowledge.
- be able to solve PS problems such as load flows, state estimation, fault analysis and stability studies
- be able to develop broad-based economically viable solutions for unit commitment and scheduling.
- be able to identify optimal solutions for improvising power transfer capability, enhancing power quality and reliability.
- be able to evolve new schemes based on literature survey, and propose solutions through appropriate research methodologies, techniques and tools, and also by designing and conducting experiments.
- be able to interpret power system data and work on well-defined projects with well defined goals to provide real time solutions pertaining to PS.
- be able to develop, choose, learn and apply appropriate techniques, various resources including hardware and IT tools for modern power engineering, including prediction and modelling with an understanding of the limitations.
- be able to develop dedicated software for analysing and evaluating specific power system problems.
- be able to participate in collaborative-multidisciplinary engineering / research tasks and work as a team member in such tasks related to PS domain, giving due consideration to economic and financial intricacies, and lead the team in specific spheres.
- be able to confidently interact with the industrial experts for providing consultancy.
- be able to pursue challenging professional endeavours based on acquired competence and knowledge.
- be a responsible professional with intellectual integrity, code of conduct and ethics of research, being aware of the research outcomes and serve towards the sustainable development of the society.
- be capable of examining critically the outcomes of research and development independently without any external drive.

M.TECH POWER ELECTRONICS

PROGRAMME EDUCATIONAL OBJECTIVES:

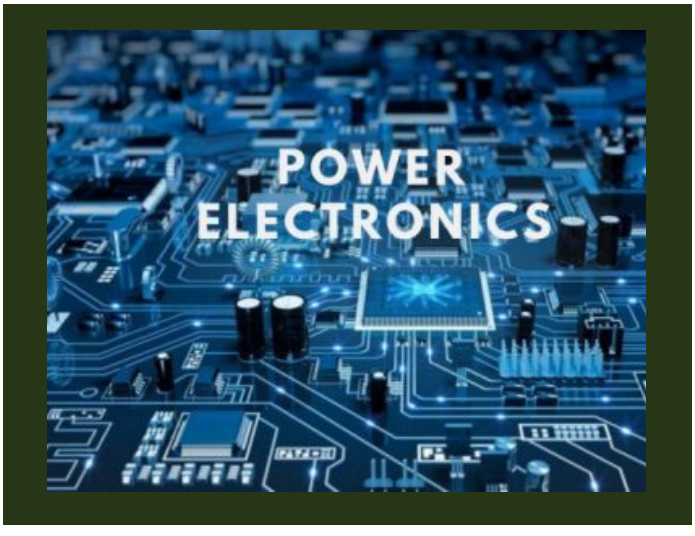
The major objectives of the M.Tech. programme in Power Electronics are to equip the students with adequate knowledge and skills in Power Electronics and to prepare them for the following career options:

- research programmes in Power Electronics and related areas.
- employment in R & D organisations related to sustainable technologies.
- to work in power electronic circuit design and fabrication industries.
- faculty positions in reputed institutions.

PROGRAMME OUTCOMES FOR POWER ELECTRONICS:

A student who has undergone M.Tech. programme in Power Electronics (PE) will:

- have an ability to evaluate and analyse problems related to Power Electronic Systems and incorporate the principles in the state of art systems for further improvement.
- be able to investigate critical PE problems and to arrive at possible solutions independently, by applying theoretical and practical considerations.
- be able to solve PE problems such as switching control, converter design, analysis and control of solid state drives and stability studies.



- be able to develop appropriate power converters for sustainable energy technologies.
- be able to identify optimal solutions for improvising power conversion and transfer capability, enhancing power quality and reliability through PE based solutions.
- be able to evolve new power electronic topologies and control schemes based on literature survey and propose solutions through appropriate research methodologies, techniques and tools, and also by designing and conducting experiments.
- be able to work on small, well-defined projects with particular goals to provide real time solutions pertaining to power electronics.
- be able to develop, choose, learn and apply appropriate techniques, various resources including sophisticated digital controllers and IT tools for modern power electronic system simulation, including prediction and modelling with existing constraints.
- be able to develop dedicated software for analysing and evaluating specific power electronics and control problems.
- be able to participate in collaborative-multidisciplinary engineering / research tasks and work as a team member in such tasks related to PE domain, giving due consideration to ecological and economical intricacies, and lead the team in specific areas.
- be able to confidently interact with the industrial experts for providing consultancy.
- be able to pursue challenging professional endeavours based on acquired competence and knowledge.
- be a responsible professional with intellectual integrity, code of conduct and ethics of research, being aware of the research outcomes and serve towards the sustainable development of the society.
- be capable of examining critically the outcomes of research and development independently without any external drive.

PUBLICATIONS AND JOURNALS

- *R. B. Prakash, R. L. Josephine., S. Moorthi, “Novel sliding mode control of single-stage induction motor drive for solar water pumping application” Electrical Engineering, Springer.(2023)*

- *R. B. Prakash, R. L. Josephine., S. Moorthi “Solar Photovoltaic Array Fed Single-stage Sensorless Vector Control of Induction Motor Drive for Water Pumping Applications” International Journal of Energy and Environmental Engineering, Springer. (2022)*

- *S.Sindhuja,S.Mageshwari and S.Moorthi ,"Analysis and Design of Two-Switch Enhanced Gain SEPIC Converter",IEEE Transactions on Industry Applications vol. 59, no. 3, pp. 3564-3564, May-June 2023, doi: 10.1109/TIA.2023.3263165.*

- *S.Malarvili and S.Mageshwari,"Nonlinear PID (N-PID) Controller for SSSP Grid Connected Inverter Control of Photovoltaic Systems", Electric Power Systems Research.June 2022.*

- *S.Sindhuja,S.Mageshwari and S.Moorthi,"Analysis of improved gain switched inductor super lift cell-based modified SEPIC converter for DC microgrid".Electrical Engineering, Springer Journal,2023.*

- *S.Sindhuja,S.Mageshwari and S.Moorthi,"Response to Discussion on “Analysis and Design of Two-Switch Enhanced Gain SEPIC Converter",IEEE Transactions on Industry Applications vol. 59, no. 3, pp. 3564-3564, May-June 2023, doi: 10.1109/TIA.2023.3263165.*

- *S.Sindhuja,S.Mageshwari and S.Moorthi,"High Gain Modified SEPIC Converter with Asymmetrical Switched Inductor Super Lift Cell for Renewable EnergyApplications".Australian Journal of Electrical & Electronics Engineering (2023), doi: 10.1080/1448837X.2023.2216333.*

- *Budhavarapu, J., Singh, H. K., Thirumala, K., & Sahoo, M. (2023). Design and implementation of smart meter for PQ-based tariff computation for LV distribution network consumers. Measurement, 216, 112959.*

- *Jisma, M., Mohan, V., Thomas, M. S., & Thirumala, K. (2023). Tail risk adjusted clean energy portfolios in P2P transactive markets using Rachev ratio. Energy Conversion and Economics, 4(2), 105-122.*

- *Ankur Singh Rana, K. Jnaneswar, Shreyas R, I. K. Sah, S. Sreekumar, M. Raju, “Systematic Review of DC Microgrid Protection Strategies and Glimpse of Implemented Real World Projects,” Journal of Electrical Engineering & Technology, Springer (Accepted) (Q2)*

- *Kolli Jnaneswar, Ankur Singh Rana, Mini Shaji Thomas, “Unreliant effect of mother wavelets in localization of power system faults for non-homogeneous AC microgrid” Electrical Engineering Springer, vol 105, pp. 1955–196, 2023. (Q2)*

- *Kolli Jnaneswar, Ankur Singh Rana, Mini Shaji Thomas, “DCVD-VMD Enabled Traveling Wave-Based Fault Location in Nonhomogenous AC Microgrids” IEEE Systems Journal: IEEE vol. 17, no. 2, pp. 2411-2421, June 2023. (Q1)*

- *Ankur Singh Rana, Jnaneswar K, Mouna Krishna, Neeraj Kumar, Shufali Ashraf Wani, Mini S Thomas, "Design and Implementation of Low-Cost PMU for Off-Nominal Frequency and DDC in Compliance with IEEE C37.118 Standard", Distributed Generation & Alternative Energy Journal: River Publisher, vol. 38, no. 02, pp. 519-546., 2023. (Q4)*

- *Ankur Singh Rana, B Bhavani Bhagyasree, Harini T.M, Sreenu Sreekumar, More Raju, "Optimisation of Economic and Environmental Dispatch of Power System with and without Renewable Energy Sources" Distributed Generation & Alternative Energy Journal: River Publisher, vol. 38, no. 02, pp. 491–518., 2023. (Q4)*

- *Vishnoi, Shreya, Srete Nikolovski, More Raju, Mukesh Kumar Kirar, Ankur Singh Rana, and Pawan Kumar. "Frequency Stabilization in an Interconnected Micro-Grid Using Smell Agent Optimization Algorithm-Tuned Classical Controllers Considering Electric Vehicles and Wind Turbines." Energies 16, no. 6, 2023: 2913. (Q1)*

- *Hiramani Shukla, Srete Nikolovski, Ankur Singh Rana, Pawan Kumar, “SMES-GCSC Coordination for Frequency and Voltage Regulation in a Multi-Area and Multi-Source Power System with Penetration of Electric Vehicles and Renewable Energy Sources”, Energies: MDPI, vol. 16, no. 251, pp. 1-27., 2023. (Q1)*

publications

- *Sreenu Sreekumar, N U Khan, Ankur Singh Rana, M Sajjadi, DP Kothari, "Aggregated Net-load Forecasting using Markov-Chain Monte-Carlo Regression and C-vine copula" Applied Energy: Elsevier Publisher, 328, 2022: 120171. (Q1)*

- *Hiramani Shukla, Srete Nikolovski, Ankur Singh Rana, Pawan Kumar, "A Particle Swarm Optimization Technique Tuned TID Controller for Frequency and Voltage Regulation with Penetration of Electric Vehicles and Distributed Generations", Energies: MDPI, vol. 15, no. 21, pp. 1-32., 2023. (Q1)*

- *Sreenu Sreekumar, Kailash Chand Sharma, Rohit Bhakar, Sishaj P Simon, Ankur Singh Rana, "Multi Interval Zero Carbon Flexible Ramp Product" Electric Power Systems Research: Elsevier Publisher, 212 (2022): 108258. (Q1)*

- *Arjun Visakh and Selvan, M.P., "Analysis and mitigation of the impact of electric vehicle charging on service disruption of distribution transformers", Sustainable Energy, Grids and Networks, Vol. 35, 2023. https://doi.org/10.1016/j.segan.2023.101096.*

- *Arjun Visakh and Selvan, M.P., "Assessing the Need for Network-Based Technical Constraints in Economic Optimization of Electric Vehicle Charging", Electrical Engineering, 2023 Available Online https://doi.org/10.1007/s00202-023-01764-z.*

CONFERENCE PAPERS

- *Nidhi Chanrakar,S.Mageshwari and S.Arul Daniel ,"Power Backflow and Efficiency Analysis of IBDC Control Techniques with Simulation." In the 10th IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2022), organized at Malaviya National Institute of Technology Jaipur, Rajasthan, India from 14th to 17th December 2022.*

- *S.Sindhuja and S.Mageshwari, "Modified SEPIC Converter Fed BLDC Motor for EV Applications".37th Indian Engineering Congress hosted by the IEI(INDIA) Chennai 16-18 Dec-2022.*

- *Elizabeth Paul and S.Mageshwari ,"Design of High Gain Modified SEPIC Converter for grid connected PV systems with MPPT control". IEEE IAS GlobConHT 2023.*

- *S.Sindhuja,S.Mageshwari and S.Moorthi,"Small-Signal Modeling of Two-Switch Enhanced Gain Modified SEPIC Converter". 2022 IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE).*

- *Anilkumar, G., & Thirumala, K. (2022, November). Voltage Quality Improvement and Power Management of Islanded AC Microgrids with Variable Loads and Sources. In 2022 IEEE 19th India Council International Conference (INDICON) (pp. 1-6). IEEE.*

- *Ankur Singh Rana, K. Jnaneswar and M. S. Thomas, "Fault Location Identification Using Hybrid Scheme in AC Microgrid," 2023 International Conference on Recent Advances in Electrical, Electronics & Digital Healthcare Technologies (REEDCON), New Delhi, India, 2023, pp. 391-396, doi: 10.1109/REEDCON57544.2023.10151183.*

- *M. Pandya, Ankur Singh Rana and A. Farhan M A, "Energy Management in DC Microgrid Using Machine Learning," 2023 International Conference on Recent Advances in Electrical, Electronics & Digital Healthcare Technologies (REEDCON), New Delhi, India, 2023, pp. 302-307, doi: 10.1109/REEDCON57544.2023.10150763.*

PUBLICATIONS

- *A. Shameem Ansar, S. Sudha, Savita Vinayagamoorthi, Michelle Marianne Menachery and Suresh Francis (2023) Landslide Classification and Prediction of Debris Flow Using Machine Learning Models, IETE Journal of Research, 68, 1-17.*

- *A. Shameem Ansar, S. Sudha and Suresh Francis (2023) Identifying suitable digital elevation model and deriving features for landslide assessment in Idukki District, Kerala, India. Current Science, 125(6),665-677.*

- *T Swathi, S Sudha (2023), Crop classification and prediction based on soil nutrition using machine learning methods, International Journal of Information Technology 15 (6), 2951-2960.*

- *Harinaik,Shelas Sathyan and Merlin Mary NJ "Design and Analysis of Modified Series Parallel Quasi Resonant Half-Bridge DC/DC Converter for Renewable Energy Applications" IEEE Journal of Emerging and Selected Topics in Industrial Electronics ,(accepted and in press),October 2023.*

- *Sofiya S,Shelas Sathyan "A Series Inductance based Three-Port Isolated Hybrid DC-DC Converter for Microgrid Applications" Elsevier Renewable Energy Focus,(accepted and in press), October 2023.*

- *Sofiya S,Shelas Sathyan "A Three-Port Isolated Hybrid Converter with Wide Range of Voltage Transformation Ratio for DC Microgrid" Springer Electrical Engineering,(accepted and in press), September 2023.*

- *Harinaik,Shelas Sathyan and Merlin Mary NJ "Design and Analysis of Quasi Resonant High Gain Impedance Source DC-DC Converter for DC microgrid" Taylor & Francis, International Journal of Electronics,(accepted and in press), June 2023.*

- *Merlin Mary NJ, Shelas Sathyan, H. M. Suryawanshi "A Three-Level Resonant DAB Converter Featuring Minimised Circulating Losses for EV Battery Charging" IEEE Transactions on Industrial Electronics, vol. 70, no. 8, pp. 7879-7890, August 2023.*

- *Sofiya S and Shelas Sathyan "A Three-Level Three Port Isolated Converter with Reduced Current Stress for DC Microgrid Applications" Wiley International Journal of Circuit Theory and Applications, (accepted and in press), 2023.*

- *Harinaik and Shelas Sathyan "Design and Analysis of Isolated High step-up Y-Source DC/DC Resonant Converter for Photovoltaic Applications" Taylor & Francis Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, vol. 45, no. 01, pp. 1604-1623 , Feb. 2023.*

- *Akash Gangwar, Merlin Mary NJ and Shelas Sathyan "Design, modelling, and simulation of bridgeless SEPIC-fed three-level soft switched converter for EV battery charging" Taylor and Francis International Journal of Modelling and Simulation , (accepted and in press), 2023.*

- *Harinaik and Shelas Sathyan "Design and Analysis of Quasi-Y Source High Gain DC/DC Resonant Converter for Renewable Energy Applications" Distributed Generation & Alternative Energy Journal, vol. 38, no. 02, pp. 569–594, Jan. 2023.*

- *Merlin Mary NJ and Shelas Sathyan "Design and Controller Implementation of 3.3kW bridgeless boost-fed Three-level Resonant converter for EV battery charging" Springer Electrical Engineering, Vol.104,pp.1935–1949, 2022.*

CONFERENCE PAPERS

- *T Swathi, TD Rasiga, S Sudha, Design of an IoT Based Soil Monitoring System, International Conference on IoT, Communication and Automation Technology (ICICAT), Buddha Institute of Technology, Gorakhpur, Uttar Pradesh, June 23-24, 2023.*

- *T Swathi, S Sudha, Crop prediction based on soil nutrient using Fuzzy Approach, The 2023 3rd International Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics, Kasetsart University, Thailand, Jan.17-19, 2023.*

- *Merlin Mary NJ and Shelas Sathyan, "A Novel Bidirectional CLC-T Resonant Immittance Converter for CC / CV Battery Charging," IEEE ESARS-ITEC, Venice, Italy, 2023.*

PUBLICATIONS

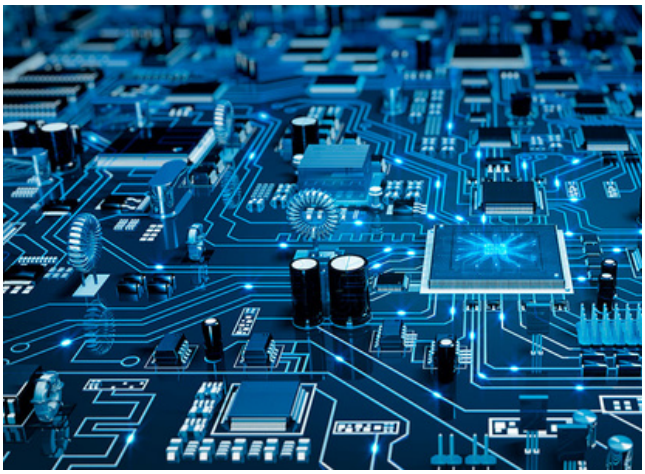
- *A. K. Pandey, H. R. S. S. N. Chatla, M. Pandya, A. Farhan M A and Ankur Singh Rana, "Image Edge Detection Using Fuzzy Logic Controller," 2023 International Conference on Recent Advances in Electrical, Electronics & Digital Healthcare Technologies (REEDCON), New Delhi, India, 2023, pp. 508-513, doi: 10.1109/REEDCON57544.2023.10150762.*

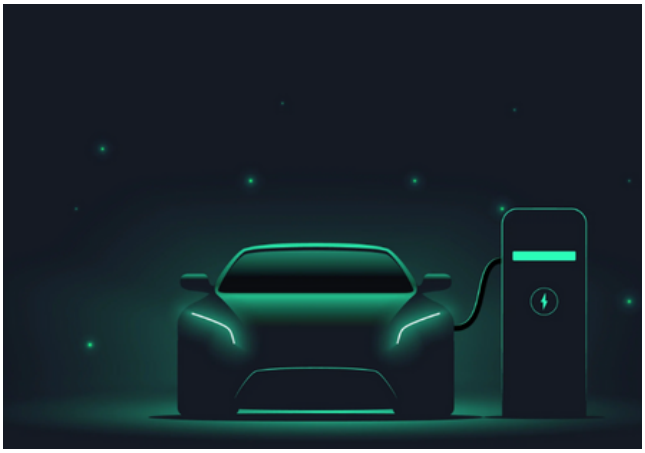
- *Arjun Visakh, Babu Thomas and Selvan, M.P., "Controlled Charging of Electric Vehicles to Reduce the Aging of Distribution Transformers", National Power Systems Conference (NPSC 2022), 17-19 December, 2022, IIT Delhi.*

- *Arjun Visakh and Selvan M.P., "The Profitability of Energy Trading Opportunities for Electric Vehicle Owners in Future Smart Grids", 10th IEEE Power Electronics, Drives and Energy Systems (PEDES-2022), 14-17 July 2022, MNIT Jaipur, India.*

- *Arjun Visakh and Selvan M.P., "A Smart Charging Strategy for Electric Vehicles to Improve the Load Factor of Distribution Systems", 7th Student's Conference on Engineering & Systems (SCES-2022), 1-3 July 2022, MNNIT Allahabad, India.*

- *Arjun Visakh and Selvan M.P., "Voltage Dependent Load Models for EV Chargers to Improve the Accuracy of Grid-Impact Studies", International Virtual Conference on Power Engineering Computing and Control (PECCON-2022), 5-6 May 2022, VIT Chennai, India.*





PATENTS

- *"AUTOMATIC MOTOR BIKE SIDE STAND", Mohd. Majid, Abhinav Saxena, Ankur Singh Rana, More Raju, Omveer Singh, Santosh Kumar Maurya, Ramashankar Yadav, Arpit.Application Number:.202311004604 A.(Indian Patent)*

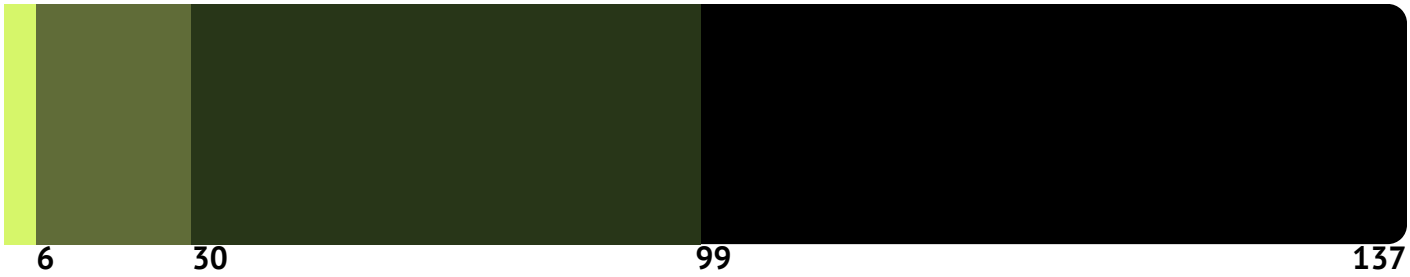
- *"EMBEDDED CONTROLLER FOR N-LEVEL MULTILEVEL INVERTER USING FPGA",Dr. B. Dastagiri Reddy, Dr. M.P. Selvan, Dr. Anish N K and Dr. S. Moorthi.Applcation Number:. 431547 (Indian Patent)*

- *"FPGA BASED MICROGRID CONTROL AND MONITORING SYSTEM",Dr. N. Kumaresan, Dr. S. Moorthi, Dr. M.P. Selvan, Dr. N. Ammasaigounden, Dr. Subin Sen and Mr. Kashish Bhambahani.Application Number:. 448560.(Indian Patent)*

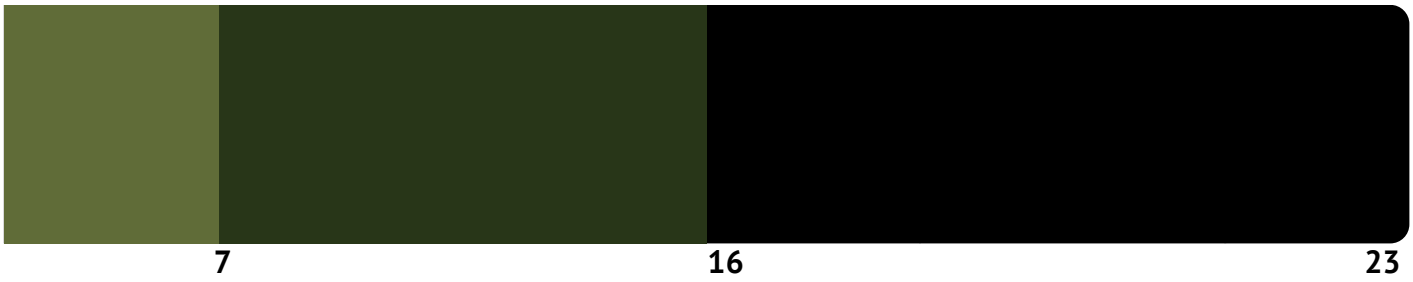
- *"S3 SINE WAVE INVERTER", Dr. B. Dastagiri Reddy, Dr. M.P. Selvan and Dr. S. Moorthi.Application Number:. 455872.(Indian Patent)*

CONVOCATION 2023

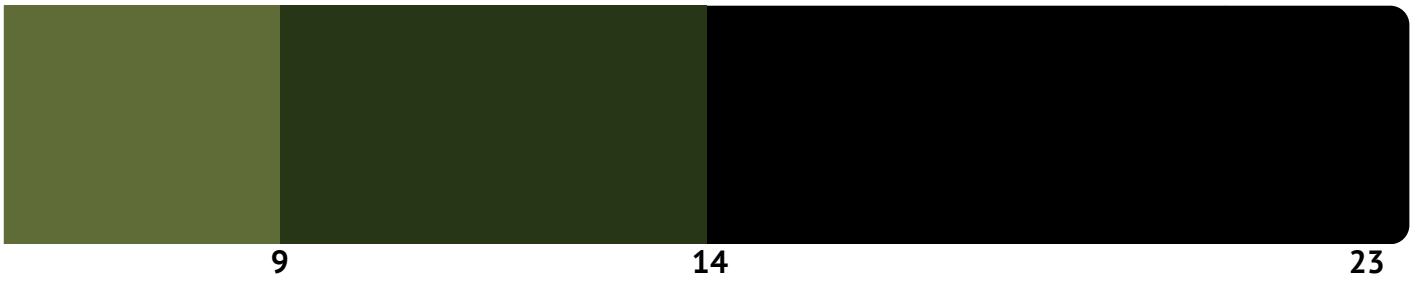
B.TECH



M. TECH POWER SYSTEMS



M. TECH POWER ELECTRONICS



Honours | First class with distinction | First class | Total

MEDAL WINNERS:

B Tech President Medal Winner
Soundarya Jayaraman

M Tech (Power Systems)
Sannidhi K V D Satya Sai Krishna

M Tech (Power Electronics)
M C Blessen

MASTER OF SCIENCE (BY RESEARCH)

SL.NO	NAME	ROLL NUMBER	NAME OF THE GUIDE	TITLE OF THESIS
1	Faresh Khan K H	307915052 20th July 2023	Dr. Sishaj P Simon	Estimation and forecasting of Solar Irradiance using Deep Learning Neural Networks
2	Somasundaram P	307917051 28th November 2023	Dr. S. Sudha	Development of Smart Infrastructure Monitoring Systems and Optimised Order Management for Telecom Office
3	Gowtham C	307919001 12th July 2023	Dr. G. Saravana Ilango	Performance Enhancement of Position Sensorless PMBLDC Motor Drive

PHD SCHOLARS

SL.NO	NAME	ROLL NUMBER	NAME OF THE GUIDE	TITLE OF THESIS
1	Joseph Godfrey A	407111002 23rd June 2023	Dr. V. Sankaranarayanan	Regenerative Braking Techniques for BLDC Motor Driven Electric Vehicles
2	Sowmya R	407117053 19th July 2023	Dr. V Sankaranarayanan	Optimal Charge Scheduling Strategies for Electric Vehicles

SL.NO	NAME	ROLL NUMBER	NAME OF THE GUIDE	TITLE OF THESIS
3	Ponraj P	407114053 15th July 2023	Dr. S. Arul Daniel	Strategies for the Operation of a Secondary Distribution Network as a Virtual Power Plant
4	Gundugallu Peddanna	407116051 18th July 2023	Dr. P. Srinivasa Rao Nayak	Design, Development and Analysis of Wireless EV Charging System using Different Spiral Structure Coils
5	Kamalapathi K	407117052 12th September 2022	D.r P. Srinivasa Rao Nayak	Design, Realisation and Performance Evaluation of Wireless Power Transfer System Integrated with Solar Power for Electric Vehicle Charging
6	Manikandan T	407117004 20th March 2023	Dr Sundareswaran K Co-Guide: Dr P Srinivasa Rao Nayak	Design, Development and Investigations on Simultaneous Transmission of Power and Full Duplex Data Communication on IPT System for Low and Medium Type Power Application
7	Krishna Kumba	407117051 16th June 2023	Dr Sishaj P Simon Co-Guide: Dr K Sundareswaran	Investigation of Second Order Level Single Axis Solar Tracking System
8	R Muhammad Ehsan	407918003 20th July 2023	Dr Sishaj P Simon Co-Guide: Dr K Sundareswaran	Mitigation of Soiling Losses in Solar Photovoltaic Power Generation Using Superhydrophobic Nano-Coatings
9	Jisma M	407118009 14th June 2023	Dr Vivek Mohan Co-Guide: Dr Mini Shaji Thomas	Financial Risk-Return Models for Generation Portfolio Selection in Energy System Planning

SL.NO	NAME	ROLL NUMBER	NAME OF THE GUIDE	TITLE OF THESIS
10	Sowthily C	407118009 26th June 2023	Dr S Senthil Kumar Co-Guide: Dr M Sridevi	Investigations on the Effective Utilisation of Solar Photo-Voltaic Array under Partial Shading Conditions and Fault Detection Schemes
11	Prakash R	407915002 30th June 2023	Dr S Senthil Kumar Co-Guide: Dr M Sridevi	Investigations on Control Strategies for Emergency Vehicle Priority in Intelligent Transportation Systems
12	Nethravathi S	407119007 17th July 2023	Dr M Venkatakirthiga	Investigations on Energy Routing Based Demand Response Strategies
13	Balasubramanian P	407914052 15th June 2023	Dr S Moorthi External Guide: Dr V Natarajan	A Novel Emulation Framework for Evaluation of Cosmic Radiation Effects in a Million Gate Digital Devices for Aerospace Applications

CURRENTS 2022 - 2023

Date: February 24th - 26th, 2023

Venue: National Institute of Technology Tiruchirappalli

Currents '23, the Electrical and Electronics Engineering Department's annual symposium at NIT Trichy, aimed at facilitating knowledge exchange between academia and industry. This national-level event featured a series of enlightening guest lectures, bridging the gap between theoretical learning and practical application.

The events organized by Currents demanded a creative and innovative approach from the students, aligning with the theme. The Workshops, Guest Lecture series, and Events series provided a significant opportunity for many students to interact with distinguished, accomplished, and innovative minds of this nation.

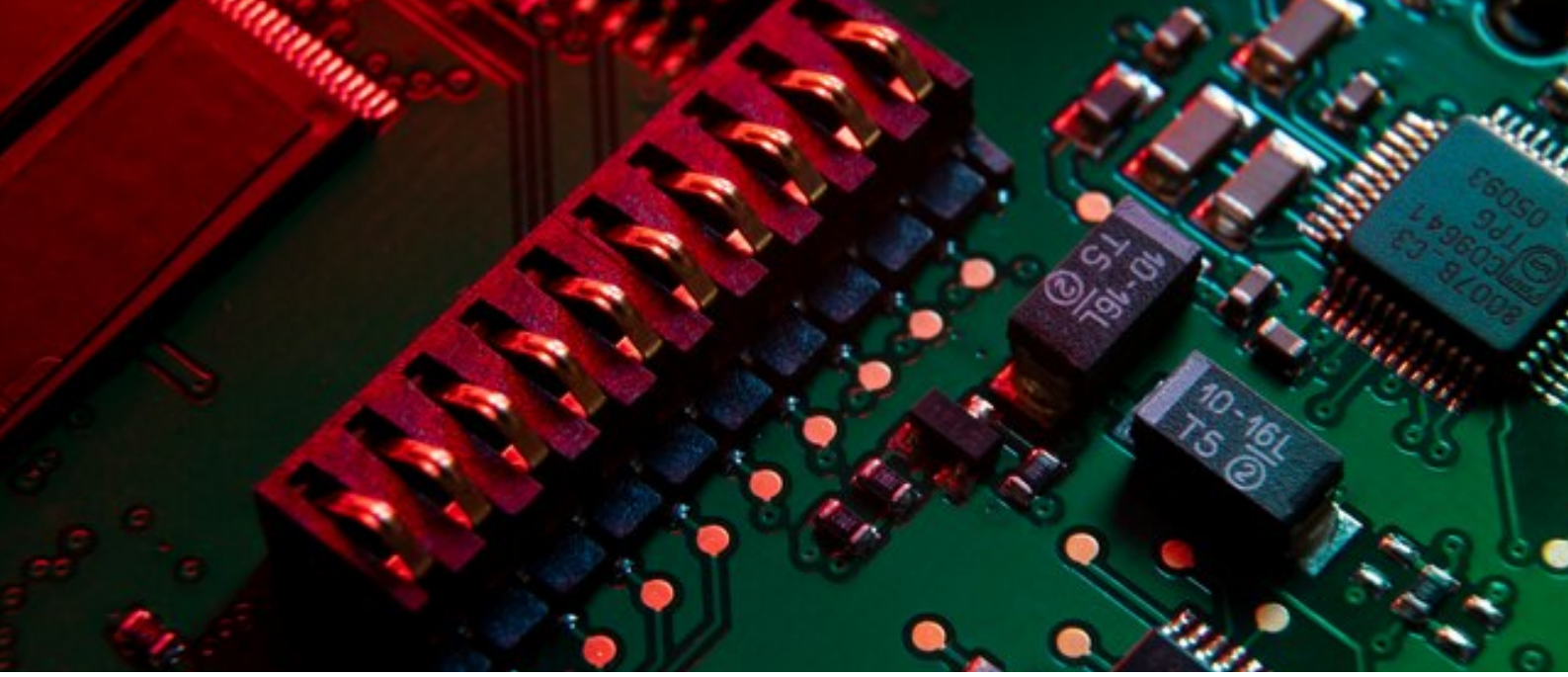
With the release of the official website, several events like Capture Currents – an online photography competition, Colloquium – Paper Presentation event, Dhruva – an event testing problem – solving and aptitude skills, Code Currents – a coding contest to test one's programming skills with specially curated coding challenges, Robo Surfers – the robotic event of Currents and Enigma – the online case study event of Currents, began accepting responses about a week before the inauguration.

Day 0 (February 24th) witnessed an interesting workshop on hardware modelling using Verilog HDL and Day 1 (February 25th) encapsulated many workshops, like Web of Cards – where the basics of web development was taught to develop a multiplayer online card game, Pixels to Perfections – in which the concepts of image processing and deep learning with neural networks were taught to develop an image classification model in Python, VLSI Design using open source – where participants were taught to design simple CMOS circuits using Google Skywater open source pdks, run pre layout simulations in ngspice, create layout using magic, and do post layout simulations, and introductory workshop on the working of hybrid electric vehicles. Day 2 (February 26th) saw an interesting workshop called Decoding Dots and Dashes, which dealt with teaching the basic concepts of machine learning and Arduino programming.

Day 0 also included a guest lecture by Dr. Brinda V, the Director at the Directorate of Safety, Reliability & Quality (DSRQ), ISRO, exploring the transformative impact of space technology, with a focus on ISRO's contributions and the Aditya – L1 mission to study the Sun. Day 1 involved a guest lecture held by Ms. Divya Tiwari, a Principal Scientist & Advisor at Saahas, which highlighted the importance of circular economy principles in the Electrical and Electronics Industry, advocating for product recovery, repair, and reuse over recycling as a sustainable approach to tackle E-waste challenges. A guest lecture held by Mr. Prithvi Velicheti, scientist at the National Remote Sensing Centre (NRSC) at ISRO, on the final day delved into the world of hardware acceleration on heterogeneous computing platforms. Additionally, two more guest lectures were hosted as part of the symposium in online mode on the 4th and 5th of March. The speakers were Mr. Balaji Ravi, a project associate at the Centre for Industrial Consultancy and sponsored research, IIT Madras, who spoke on the topic of "Electric Vehicles and Subsystem 101", and Mr. Puneet Panwar, Scientific Officer at BARC, Mumbai, who delivered a talk on the subject of "Optimal Control Theory: A Practical Perspective".

Currents '23 provided a platform for industry experts to share their insights with students and faculty. The symposium underscored the significance of interdisciplinary collaboration, emphasizing social, economic, and environmental considerations in engineering. The diverse backgrounds of the guest speakers highlighted the EEE Department's commitment to providing a holistic education and fostering meaningful industry-academia partnerships.

In conclusion, Currents '23 was a successful event that promoted the exchange of ideas, bridged the gap between academia and industry, and inspired a new perspective on sustainable engineering practices. The event left a lasting impact on the NIT Trichy community, further reinforcing the importance of staying current with the ever-evolving field of Electrical and Electronics Engineering.



Silicon Dreams: India's Growing Semiconductor Industry

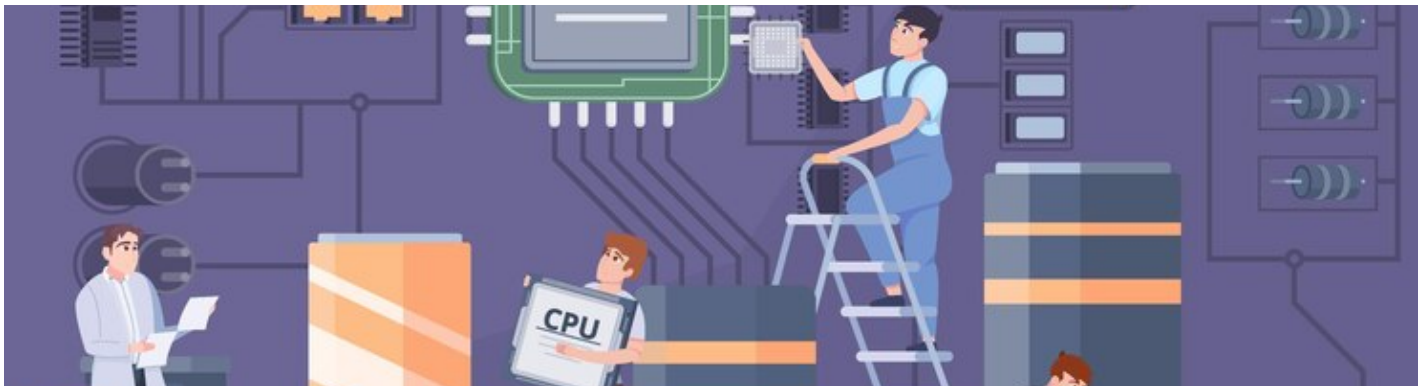
The global economy is undergoing a significant transformation, with companies shifting their operations away from China and towards India. Several factors drive this trend, including rising costs in China, trade tensions between the US and China, and government policies in China that have made it more difficult for foreign companies to operate in the country. The pandemic also highlighted the risks of relying too heavily on a single country for manufacturing.

China, for example, is a major producer of semiconductors, which are essential components in a wide range of electronic products. However, when China imposed lockdowns in 2020, it caused a global semiconductor shortage, which had a ripple effect on other industries, such as automotive and consumer electronics. These experiences have led many countries to conclude that they must reduce reliance on a single country for manufacturing. This is driving a trend towards decentralising manufacturing industries and diversifying supply chains.

India is one of the countries that is benefiting from this trend. India has many advantages that make it an attractive destination for manufacturing, including a large and young workforce, a growing domestic market, and government support, which attracted companies looking to relocate or expand their operations.

"Semiconductors are the new oil."
- Narendra Modi, Prime Minister of India

The semiconductor industry is one of the fastest-growing industries in the world, and India is well-positioned to capitalise on this growth. These experiences have led many countries to conclude that they must reduce reliance on a single country for manufacturing. This is driving a trend towards decentralising manufacturing industries and diversifying supply chains.



Factors Contributing to the Semiconductor Boom in India

Growing electronics manufacturing sector: India is now the world's second-largest smartphone market, and the country's electronics manufacturing sector is growing rapidly, thus creating a massive demand for semiconductors in India.

Increasing demand for 5G technology: 5G technology is expected to be rolled out in India in the next few years, further increasing the demand for semiconductors.

Government push to make India a global semiconductor hub: The Indian government has launched many initiatives to promote the growth of the semiconductor industry in the country. These initiatives include providing financial incentives to semiconductor manufacturers, setting up semiconductor parks, and developing a skilled workforce.

These companies will cater to a wide range of industries, including Electronics Manufacturing, Automotive, Telecommunications, Consumer Electronics, Aerospace and defence, Medical devices, Industrial Automation, Internet of Things (IoT) and many more.

These companies' investment in the semiconductor industry in India is a positive development for the country. The semiconductor industry is a high-tech industry that creates high-paying jobs. The semiconductor industry's growth in India will help the country become a global electronics manufacturing and technology leader. The semiconductor boom in India is also expected to lead to the development of a domestic semiconductor ecosystem in India. This will help to reduce India's reliance on imported semiconductors and boost the country's economy.

Companies Investing in the Semiconductor Industry in India

Many companies have announced plans to invest in the semiconductor industry in India. These companies include:

Vedanta: Vedanta has announced a joint venture to build a $20 billion semiconductor manufacturing plant in Gujarat. The plant is expected to start production in 2025.

TSMC: TSMC (Taiwan Semiconductor Manufacturing Company Limited), the world's largest semiconductor manufacturer, is reportedly in talks with the Indian government to build a semiconductor plant in India. If the deal goes through, it would be TSMC's first manufacturing plant outside Taiwan.

Intel: Intel is also reportedly considering building a semiconductor plant in India. Intel has a long history of manufacturing semiconductors in the United States but is looking to expand its manufacturing capacity to other countries.

IGSS Ventures: IGSS Ventures, a Singapore-based company, has announced plans to build a $3 billion semiconductor manufacturing plant in Karnataka. The plant is expected to start production in 2024.

ISMC: ISMC, a consortium of international semiconductor companies, has announced plans to build a $7.5 billion semiconductor manufacturing plant in Karnataka. The plant is expected to start production in 2025.

Applied Materials: Applied Materials, a leading semiconductor equipment manufacturer, has announced plans to set up a unit in India to manufacture and service semiconductor equipment. The unit is expected to start operations in 2023.

Lam Research: Lam Research, a prominent semiconductor equipment manufacturer, has recently revealed its plans to inaugurate a new unit in India, dedicated to the production and servicing of semiconductor equipment. The anticipated launch date for this unit is 2023.

Challenges Associated with the Semiconductor Boom

Some challenges must be addressed to ensure the boom is sustainable and inclusive.
The semiconductor boom could lead to environmental problems. Semiconductor manufacturing is a water-intensive process. It also generates a lot of hazardous waste. Some such challenges are described below.

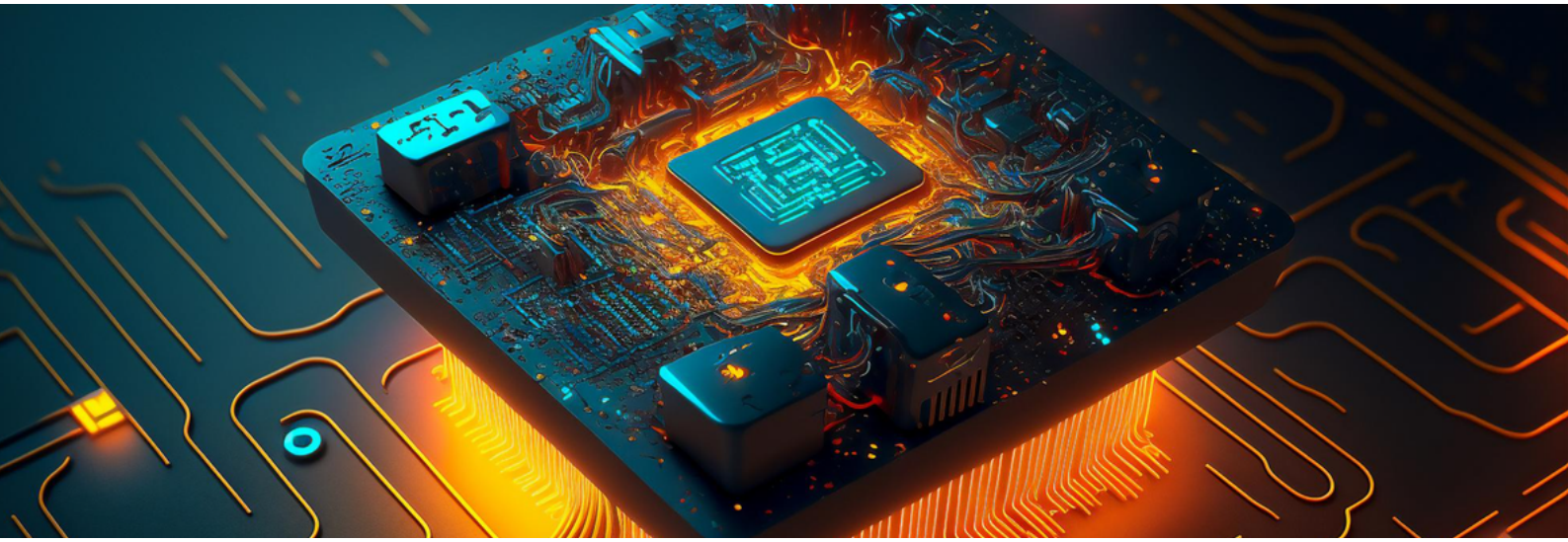
Wafer cleaning: Silicon wafers are used as the substrate for semiconductor chips. These wafers need to be extremely clean to produce high-quality chips. The cleaning process involves using a lot of water.

Photolithography: Photolithography is a process used to transfer patterns onto silicon wafers. This process involves using a photosensitive material and a light source to expose the wafer to a desired pattern. The wafer is then developed and etched. Photolithography uses a lot of water, both for cleaning and rinsing.

Chemical-mechanical planarization (CMP): CMP is a process used to polish the surface of a silicon wafer. This process involves using a slurry of abrasive particles and a chemical solution. CMP utilises a lot of water to rinse away the slurry and chemical solution.

Cooling: Semiconductor manufacturing equipment generates a lot of heat. This heat needs to be dissipated to prevent the equipment from overheating. Cooling towers are used to cool the equipment, and cooling towers use a lot of water.

The water intensity of semiconductor manufacturing is a major concern, especially in regions facing water shortages. Semiconductor manufacturers are working to reduce their water consumption, but it is a challenge. Semiconductor manufacturers are taking steps to reduce their water consumption by recycling water, using water-efficient equipment, and improving their water management practices.



The semiconductor boom in India is a once-in-a-generation opportunity for the country to become a global leader in technology and innovation. By embracing this opportunity, India can create a brighter future for its citizens and become a beacon of hope for the world.

The Indian government has already taken steps to support the semiconductor industry, and it is now up to the private sector to step up and invest in this critical sector. With the right combination of government support and private sector investment,

India can become a semiconductor powerhouse and a significant player in the global technology ecosystem.
The semiconductor boom in India is a watershed moment in the country's history. It is a chance to break free from the past and create a new future where India is a leader in technology and innovation, and its citizens can enjoy the benefits of a thriving economy.
The semiconductor boom in India is a shining example of what can be achieved when a country comes together to pursue a common goal. It is a story of hope, resilience, and determination. It is a story that the world needs to hear.

Hyperloop: A Technical Odyssey into the Future of Transportation

In the ever-evolving landscape of transportation, one concept is causing ripples that may soon turn into waves – the Hyperloop. Conceived as a radical solution to modern transit challenges, this brainchild of entrepreneur Elon Musk has captivated the world's imagination with its promise of high-speed, efficient, and sustainable travel.

What exactly is a hyperloop?

At its core, the Hyperloop is a visionary transportation system that involves passenger or cargo pods hurtling through low-pressure tubes at speeds rivalling commercial aeroplanes. The underlying principles include magnetic levitation to eliminate friction, reduced air pressure within the tubes to minimise resistance, and an innovative propulsion system for swift acceleration.

The Essence of Hyperloop Technology

Magnetic Levitation and Propulsion:
At the heart of the Hyperloop lies magnetic levitation, a technology that eliminates the friction between the pod and the tube. The pod hovers above the track using powerful magnets, minimising energy loss. Propulsion is achieved through electromagnetic forces, propelling the pod at astonishing speeds.

Reduced Air Pressure:
To conquer air resistance, the Hyperloop tube is designed to maintain low pressure. This near-vacuum environment significantly decreases air drag, enabling the pod to reach high velocities with minimal energy consumption.

Race to Reality: Leading Players in Hyperloop Development

Several frontrunners have emerged in the quest to transform the Hyperloop from a concept on paper to a tangible mode of transportation. Companies such as Virgin Hyperloop, SpaceX, and Hyperloop Transportation Technologies have taken the lead, investing heavily in research, development, and ambitious testing programs.

Virgin Hyperloop, for example, recently celebrated a breakthrough with its successful full-scale system test, achieving record speeds while showcasing the safety and feasibility of its magnetic levitation technology.

Overcoming Challenges: The Journey to Implementation

While the allure of travelling at near-supersonic speeds captures the public's imagination, the Hyperloop faces many challenges: regulatory frameworks, safety considerations, and the vast infrastructure required present formidable obstacles. Industry experts and policymakers are collaboratively navigating these challenges, emphasising the need for rigorous testing and comprehensive safety measures.

The Hyperloop Promise: Revolutionising Transportation

Proponents of the Hyperloop extol its potential to revolutionise transportation. Imagine commuting between cities at speeds exceeding 700 miles per hour, drastically reducing travel times and congestion. The system's minimal environmental footprint and energy efficiency contribute to its appeal as a sustainable alternative to traditional transit modes.

Societal Impacts

Navigating the Uncharted Territory

The potential societal impacts of the Hyperloop are as transformative as the technology itself. Some potential outcomes are improved connectivity between cities, expanded economic opportunities, and the prospect of redefining urban planning.

Sceptics, however, caution against overlooking the societal, economic, and environmental challenges accompanying such a disruptive shift.

Future Horizons: What Lies Ahead for Hyperloop Technology?

As Hyperloop technology advances, questions persist about its practical implementation, public acceptance, and scalability. Governments, investors, and the public are keenly observing this innovation, recognizing its potential to reshape the future of transportation.

In conclusion, the Hyperloop represents a paradigm shift in transportation, challenging the boundaries of speed and efficiency. As engineers and innovators continue to refine and advance the technology, the Hyperloop promises to transform how we perceive and experience long-distance travel.

Human Identity Chips: A Double-Edged Sword

Human identity chips are RFID (Radio-Frequency Identification) chips that can be implanted under the skin. They are typically the size of a grain of rice and contain a unique identifier that can be read by a scanner.

ETHICAL AND SOCIAL CONCERNS

Human identity chips can potentially revolutionise how we live and work, but they also raise several ethical and social concerns. One of the biggest concerns about human identity chips is that they could be used to track people without their consent, leading to a loss of privacy and autonomy.

Additionally, there is the risk that human identity chips could be hacked, potentially exposing people's personal information to criminals or other unauthorised individuals. Another concern is that human identity chips could be used to discriminate against certain groups of people.

For example, employers could require employees to have human identity chips implanted to work, or governments could need citizens to have human identity chips implanted to access certain services. This could lead to a society where people with human identity chips have more rights and privileges than those without them.

Positive Applications of Human Identity Chips

Despite these concerns, human identity chips also have the potential to be a powerful tool for improving our lives. For example, human identity chips could be used to:

Improve security: Human identity chips could be used to replace passwords and PINs, which can be easily lost or stolen. They could also be used to track people's movements in secure areas and to prevent unauthorised access.

Improve healthcare: Human identity chips could store patients' medical records and make them easily accessible to medical professionals in an emergency. They could also track patients' vital signs and monitor their compliance with medication schedules.

Broader Implications of Human Identity Chips

Human identity chips could exacerbate existing inequalities: If they become widely adopted, they will likely be more accessible to people with wealth and power. This could lead to a society where people with human identity chips have even more advantages than those without them.

Human identity chips could alter social interactions: Human identity chips could reshape our interpersonal dynamics by enabling easy tracking of one another's movements and access to personal information. This shift is likely to have both positive and negative consequences. For instance, it may pose challenges to maintaining privacy and fostering trust among individuals.

Human identity chips could lead to new forms of social control: If governments and other powerful institutions can access our personal information and track our movements, they will likely use this information to control us in new and insidious ways.

Overall, human identity chips are a powerful technology with the potential to both improve and harm our lives. It is crucial to have a public conversation about the potential implications of this technology before it is widely adopted. We need to develop clear guidelines for how this technology will be used and how people's privacy will be protected.

~KEERTHANA

Shaping the Future: Emerging Trends in EEE

Disclaimer: *The following content has been automatically generated by an AI system and should be used for informational purposes only. We cannot guarantee the accuracy, completeness, or timeliness of the information provided.*

Editor's Note: *The usage of Artificial Intelligence has significantly increased in recent times. ChatGPT has gained popularity among students for a wide range of reasons. We aimed to explore the distinctions between AI-generated articles and human-written articles in terms of audience perception. We welcome your insights on this experiment. Feel free to share your thoughts with us at contenthead.eeea@gmail.com.*

Electrical and Electronic Engineering (EEE) is a dynamic and ever-evolving field at the forefront of technological innovation. As the world becomes increasingly interconnected and reliant on electronic devices, EEE professionals are tasked with developing solutions to complex problems. In this article, we will explore some of the most prominent emerging trends in EEE that are shaping the future of the industry.

Renewable Energy and Power Electronics

The drive for sustainable energy solutions has brought renewable energy sources to the forefront of EEE. Solar panels, wind turbines, and energy storage systems are undergoing constant advancements. Power electronics play a crucial role in the efficient conversion and distribution of renewable energy. The trend towards cleaner and more efficient energy sources is reshaping power generation and distribution systems worldwide.

5G and Beyond

The rollout of 5G networks has already begun, promising unprecedented data speeds and low latency. However, the trend goes beyond 5G; research and development are focused on 6G and beyond, which will open up possibilities for real-time augmented and virtual reality experiences, remote surgery, and autonomous vehicles. EEE professionals are at the heart of designing and implementing these next-generation wireless technologies.

Internet of Things (IoT)

The IoT continues to expand, with an ever-growing number of devices connecting to the internet. EEE is integral to the development of IoT by designing the sensors, communication systems, and data analysis tools that make it possible. IoT is revolutionizing various industries, from healthcare and agriculture to smart cities and transportation.

Cybersecurity

With the increasing interconnectivity of devices and systems, the need for robust cybersecurity has never been greater. EEE professionals are working to develop secure communication protocols, encryption methods, and hardware security solutions to protect sensitive data and critical infrastructure from cyber threats.

Biomedical Electronics

The convergence of electronics and healthcare has given rise to biomedical electronics. This trend encompasses wearable health monitoring devices, medical imaging equipment, and advancements in telemedicine. EEE experts are contributing to innovations that enhance patient care, streamline medical diagnostics, and improve the overall healthcare experience.

Edge Computing

Edge computing is a paradigm shift that involves processing data closer to the source, rather than relying solely on remote cloud servers. This trend is essential for applications that require low latency, such as autonomous vehicles and real-time industrial processes. EEE professionals are working on edge computing solutions to enable faster and more efficient data processing.

Artificial Intelligence (AI) and Machine Learning

AI and machine learning have immense potential in EEE, from improving manufacturing processes to optimizing energy consumption. Smart grids, predictive maintenance, and autonomous systems are just a few applications. Engineers are integrating AI into hardware and software design, creating more intelligent and responsive devices.

The field of Electrical and Electronic Engineering is undergoing a profound transformation, driven by the demands of an interconnected and technologically driven world. From renewable energy and 5G networks to artificial intelligence and biomedical electronics, emerging trends are shaping the future of EEE. The engineers, scientists, and innovators in this field are at the forefront of creating solutions that address global challenges and improve our quality of life. As these trends continue to evolve, EEE professionals will remain at the heart of technological progress, ensuring that the future is both innovative and sustainable.

TEXAS INSTRUMENTS

The work culture at TI is very flexible and employee-friendly. The hospitality they showed to us is really heartwarming. My manager, mentor and fellow mates supported me throughout my internship. Their guidance was a backbone in completing my project. At TI they focus on the quality of work produced instead of running for deadlines. It was a stressless and joy-filled job. At times we as a team used to go for evening walks, lunches, tea breaks etc, where we shared convos, gossip and of course laughter.

ABOUT TI

I have undertaken 2 months of internship at Texas Instruments in embedded processing domain as a Software engineer and below is the overview of the company. TI is a global semiconductor company that designs, manufactures, and sells analog and digital integrated circuits (ICs) and embedded processors. TI's business units are divided into two main categories: analog and embedded processing.The analog business unit designs and manufactures ICs that are used in a variety of applications, such as power management, signal processing, and sensing. The embedded processing business unit designs and manufactures ICs that are used in embedded systems, such as microcontrollers and processors.

SELECTION PROCESS

The Selection process consisted of one online test and one technical interview. Online tests focused on concepts like C, Memory management units, OS, and 8085 instruction sets. It was an objective test with aptitude. In the technical interview, they tested my knowledge in OS, 8085, Computer Organisation and Architecture, Memory management units, Basics of C, Python, Java, OOPs and finally the resume interview.

PROBLEM STATEMENT

Developing embedded software applications requires a thorough understanding of the SoC architecture, which can be complex and time-consuming to learn. Additionally, basic GPIO toggle example code in code composer studio has around 40 lines of code, which is significantly more than the one line of code required in other programming languages such as Python, JavaScript, and 4 lines of code in C, C++, and Java. This can be counterintuitive for beginners, and it can also make it difficult to debug and maintain code. Finally, embedded C driver library function signatures can be difficult to learn for beginners, as they often use complex syntax and parameters.

The objective of this project is to simplify embedded software application development on MSPM0+ devices by using a drag-and-drop type code design tool, where the developer need not write even a single line of code. To design plugins for graphical coding languages to operate on MSPM0+ devices by creating a Hardware Abstraction Layer on top of the Driver Library.

THE PREPARATION

To secure this internship, I started working in the early days of my second year. Firstly, I learned basic programming concepts in C and Python. I was very interested in coding development boards like Arduino and did a few projects on the internet. In the middle of the year, I worked on Machine Learning and did a few projects. I studied 8085 basics and Computer organisation and architecture at the end of my second year. During the summer break, I undertook 2 months internship at CDAC, Trivandrum in a government-funded project titled “Emergency Response Support System”. My contribution towards the project was mainly focused on making camera systems intelligent through machine learning. Later during the beginning of my third year, I applied for a TI internship on campus for an embedded software engineer role and I got selected.

THE ADVICE

If you are aspiring to get into this domain, start your journey early! Learn C Language, focus on Pointers, structure pointers, function pointers, Bit manipulations, Endianness, sorting, C program compilation stages, Memory management units like RAM (S, D), ROM (P, E, EEP), Flash memory, Cache memory, OOPs, C memory layout (stack, heap), Basic DSA, C based problem solving, OS, RTOS, Computer Organisation and Architecture. Then study Microprocessors and Microcontrollers course, 8085 instruction sets, architecture etc. Try to do 8085, Arduino/Raspberry Pi/ TI MCUs/ESP32 implementations from the internet as much as you can to get yourself familiar with them. Also learn serial communications like SPI, I2C, UART, CAN, analog peripherals like GPIO, ADC and Timers.

Then do some value-adding projects on microcontrollers and take help from profs, TAs, club members/ Workshops etc. During your preparation, it is advised to revise Digital electronics concepts and have at least one digital project. Curate your resume properly, be confident in your preparation and then you are good to go!

PS: *If you are aspiring to get into TI, It is good to have basic analog knowledge (if domains other than analog are chosen) like circuit theory, op-amps, RLC circuits, and analog electronics regardless of what domain you choose, this will definitely give an edge as 90% of TI is ANALOG.*

~ SURENDRA SRINIVAS

TATA STEEL

"It recognizes the importance of work-life balance and provides you with an ample amount of time to pursue your interests."

THE PREPARATION

I interned at Tata Steel Limited, a core electrical company. My project location was Jamshedpur, and it was a complete offline internship for 8 weeks. The selection process included three rounds: technical assessment, group discussion (which did not happen for the electrical core), and personal interview (technical and HR). The online test was core electrical but mostly electronics, along with aptitude, with 20 questions in both sections (as I recall, not so sure). Then happened a personal interview where I was asked to give an introduction, after which they asked what subjects I was interested in and went straight to asking questions from transformers, TnD, induction machines, and some misc. things were asked at the end.

THE EXPERIENCE

My project was 'Auto Positioning Of Hot Metal Cranes In Steel Melt Shop' where I got to build a prototype to automatically position and monitor the crane movements for safer positioning, and plant visits happened frequently. I was also able to visit other sections of the huge plant, which gave me greater insights into the overall steel-making process and the engineering touch involved in it.

TATA STEEL is known for its strong work culture and values. It recognizes the importance of work-life balance and provides you with an ample amount of time to pursue your interests. My manager was a great guy; he insisted on having weekly reviews to discuss updates on the project. I have learned so much from his extensive knowledge of electrical maintenance (his field of expertise). He was very supportive and created an inclusive environment, which made my internship truly enjoyable.

During my leisure time, I explored a few parts of Jharkhand and tried ALL the local food. I only went out to eat because the weather was unimaginably HOT.

I followed the resources shared by our seniors and referred to class notes for a few topics like digital electronics, and that helped me a lot during OT and interview. I would say to start your preparations early because companies like TATA come in at the very beginning. Keep your concepts clear and have a good idea of machines, TnD, and basic circuit theory, digital electronics, and basic electronics, and this will hopefully land you an internship.

~ISHWARYA

PROCTER & GAMBLE

During my two-month internship at Procter and Gamble (P&G) in the product supply domain, I had the opportunity to gain valuable insights into this renowned American multinational consumer goods corporation. P&G is a leader in a diverse range of personal health, consumer health, personal care, and hygiene products. The company is structured into distinct segments, including beauty, grooming, health care, fabric and home care, and baby, feminine, and family care. My experience at P&G allowed me to witness firsthand the inner workings of this industry giant.

The selection process for the internship was rigorous and consisted of two online tests and 2-3 rounds of HR interviews. The online tests comprised a psychometric test to assess the alignment of our work ethic with the company's values and a three-part puzzle-solving test that evaluated our problem-solving skills and accuracy. In the HR interviews, I was evaluated on my responses to various situational scenarios.

Due to confidentiality clauses, I cannot disclose the specific project I was engaged in during my internship. However, I can share that the overall experience was incredibly smooth. P&G's environment is characterised by approachable and helpful individuals who readily offer guidance and support.

In my leisure time during the internship, I usually explored the city on weekends. On office days, all the interns, including myself, would gather for dinner and engage in lively conversations, strengthening our professional and personal bonds.

Securing this internship opportunity required preparation, primarily centred on understanding the company's Points of Recognition (PoRs) thoroughly. The online tests are challenging to prepare for, but a deep understanding of the company's Purpose, Values, and Principles (PVP) can help align your responses with their values. It's crucial to be well-versed in the STAR format (Situation-Task-Action-Result) for structuring your answers in the HR interviews.

For aspiring junior candidates looking to follow a similar path, I would advise them to focus on researching the company's values and principles, as well as being prepared to answer situational questions in the STAR format. Additionally, networking with professionals in the field and building connections within the industry can be instrumental in securing an internship at a prestigious company like P&G. Overall, my internship at P&G was an enriching experience that has contributed significantly to my personal and professional growth.

~ MRISHANA BISWAS

INDIAN INSTITUTE OF SCIENCE

I undertook a research Internship in the SPIRe lab of the Electrical Engineering department of IISc Bangalore. I cold-mailed professors who had similar interests as I did. I was mainly focusing on professors in CSE and EEE who were into some research in the area of AI and ML. A friend suggested to me a list of professors and my intern professor was one of them. He already knew people who secured internships under him so I applied as well and got a response.

I was engaged in a project where I solved the problem faced by many Indian students- thick accent of foreign professors. This accent can sometimes be a hindrance to the learning process and it slows down the learning process when students have to look at the transcript each time (when learning online through sites like Coursera). So what we did was , we collected voice and corresponding transcript data and split it into 10 secs pieces. We used a text-to-speech model to generate the speech from the transcription. The accent of this speech will be an Indian accent. We also worked on identifying the speaker's accent using spectrogram data from open-source audio files of different languages (we used 3 different languages). Each language would have a different accent of English, which will be a parameter for the text-to-speech model (TTS model). I developed an interface using a flask for this project.

As for leisure time, I went mostly to walkable regions and had multi-cuisine food. The rest of the time I didn't go out much but many of those who came to do a research internship there did go out to tourist places on weekends.

I got this internship through cold mailing. I had taken a few courses related to ML before and did 1 project. This helped me in getting this internship. My advice to juniors will be to perform a basic ground up research on what field or area of research you are interested in, then try to acquire skills related to it, maybe try to do small projects using your newly acquired skills.

If there are competitions or hackathons that test these skills and participate in them, it's a good learning experience. Finally make sure to mail professors whom you think have a good chance to reply to you as his/her area of research matches your interests.

~ L VIJAYKRISHNAN

DAAD-WISE

To get the intern, I had to research a bit on professors who specialise in my areas of interest and send them mails asking for an intern opportunity. Once I got a positive reply, we confirmed the topic that I would be working on. I then applied for the DAAD WISE scholarship, where I had to submit the application and relevant documents.

I had a very nice experience there. The professor and his team were very welcoming and supportive. The labs were well equipped and I was able to explore a lot of new ideas. The working hours were flexible and I tagged along with them for some visits. I enjoyed the culture and cuisine of Germany and some of its neighbours.

The project dealt with study of partial discharges (PDs) that arise in degraded hairpin windings, used in the motors of Electric vehicles. Insulation deteriorates over time due to the impact of temperature, moisture, exposure to sunlight and ageing. Higher slew rates, increased voltages fed by inverters and harmonics may cause increased electric stress. This would lead to PD if the critical voltage of the insulation system is exceeded. A miniaturised test block that represents one stator slot is designed to study PD in the turns of a hairpin wound stator. Partial Discharge Inception and Partial Discharge Extinction Voltages (PDIV and PDEV) are measured to investigate the case.

"I went to the University of Stuttgart, Germany for my summer internship and worked on 'Partial Discharge Measurements in Hairpin Windings of Inverter Fed Motors'. "

~ JENNIE ANGELA JOSE SHIRLEY

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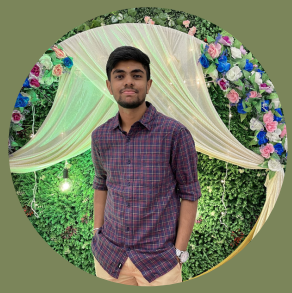

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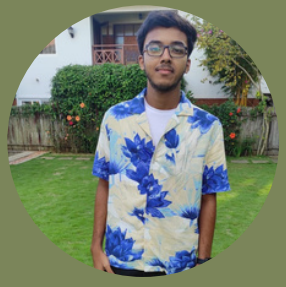

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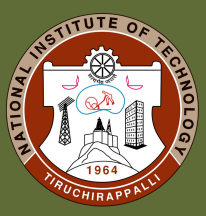

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