



Centre for Career Development  
Indian Institute of Technology, Guwahati

**Placement  
Brochure**

**Class of 2024**

Bachelor of Technology  
Master of Technology  
Doctor of Philosophy  
Dual[MS + PhD]

# Department of Electronics and Electrical Engineering



## Message from Head of the Department

### Prof. Roy P. Paily

We are delighted to present the Electrical Engineering Department at the prestigious Indian Institute of Technology Guwahati (IITG) to your organization. It gives me great pleasure to introduce our exceptional pool of talent and invite you to discover the immense potential of our students.

At IITG, we nurture aspiring electrical and electronics engineers to become leaders and innovators in their fields. Our department boasts a rich legacy of academic excellence, cutting-edge research, and a focus on practical application. Our students are equipped with a strong foundation in theoretical knowledge, complemented by hands-on experience in state-of-the-art laboratories.

Our distinguished faculty members are leading experts in their respective fields. They inspire and mentor students, encouraging them to push the boundaries of knowledge and develop innovative solutions to real-world challenges. Our curriculum is designed to provide a holistic education that prepares students to excel in their careers and contribute to the growth and success of your organization.

The Electrical Engineering Department at IITG offers a wide range of specializations. Our students have access to advanced tools, software, and equipment, enabling them to conduct groundbreaking research and solve complex problems. Through their academic projects, internships, and industrial collaborations, our students have consistently demonstrated their ability to apply their theoretical knowledge to practical scenarios.

We firmly believe in fostering a spirit of collaboration and teamwork. Our students actively engage in interdisciplinary projects, participate in national and international competitions, and take part in co-curricular and extracurricular activities. These experiences enhance their communication, leadership, and problem-solving skills, making them valuable contributors to any team or organization.

Furthermore, our strong industry connections ensure that our graduates are well-prepared to make an immediate impact in the corporate world. Our Training and Placement Cell works closely with leading companies to facilitate internships, industrial visits, and placement opportunities that align with the organization's requirements.

We invite you to explore the profiles of our talented students, each equipped with a unique blend of technical expertise and leadership qualities. We are confident that you will find exceptional candidates who can contribute to the growth and success of different organizations.

A large number of our alumni are successful in different careers and many of them occupy top positions in both academia and industry all over the world, and some of them have founded successful enterprises.







# About The Institute

## Indian Institute of Technology, Guwahati

Established in 1994, as an 'Institute of National Importance', IIT Guwahati has grown into being a preferred destination for people passionate about learning and innovation. IIT Guwahati has been ranked among the Top 100 Young Universities in the world by the Times Higher Education, one of the two Universities from BRICS nations. IIT Guwahati has several factors contributing to how in a short span of time it has established itself as one of the best institutes of its kind in the country. The programmes and courses that are offered at IIT Guwahati are perpetually evolving to adapt to the ever changing global requirements and along with the diversity of the fields of study, this has helped the institute become one of the nation's nerve centres for research and development, and technical education. The faculty ensure that the students of the campus are ready to face the challenges of the professional world by providing them with a sound conceptual understanding of their respective disciplines. The institute also offers a plethora of opportunities to students for their holistic development, through the excellent facilities that it has for sports and general extracurricular activities.



## About The

# Department of EEE

The department was established during the inception of the institute in 1995 as the department of Electronics and Communication Engineering (ECE). Since its commencement, the primary objective of the department has been to impart quality education, training and research at the undergraduate, postgraduate and doctoral levels in various areas of Electronics and Communication Engineering with broad emphasis on design aspects of electronic systems.

## Faculty

The major areas of faculty expertise of the department include Biomedical Signal Processing, Communication Systems, Computer Networks, Control Systems, Digital Signal Processing, Image Processing & Computer Vision, Pattern Recognition, Instrumentation, Multimedia Security, Power Electronics, Power Systems, Radar Signal Processing, RF and Microwaves, Microstrip Antennas, Optoelectronic and Optical Communication, Speech Signal Processing, VLSI Systems and MEMS.

## Students

The Electrical and Electronics Engineering (EEE) department of our institute nurtures a diverse and talented pool of students, well-equipped to excel in the corporate world. Our students possess a unique combination of theoretical knowledge, practical skills, and a passion for innovation. With a comprehensive curriculum that covers a wide range of subjects including power systems, control systems, electronics, and communication, our students are equipped with a strong foundation in electrical engineering principles.





## Programs Offered

# Bachelor of Technology

The institute offers two programs in B.Tech, Electronics and Communication Engineering and Electronics and Electrical Engineering.

### Electronics and Communication Engineering

This program aims at providing a strong foundation in theoretical, practical and design aspects of Electronics and Communication Engineering (ECE). The curriculum covers all areas of electronics and communication engineering under the broad categories of electronic circuits, electronic devices, signal processing and communication.

### Electronics and Electrical Engineering

The department has started the B. Tech. programme in Electronics and Electrical Engineering (EEE) from the year 2008. The programme aims at producing engineers with sound knowledge in electrical engineering and a strong background in electronics.

# Master of Technology

In 2010, the department has started two new M. Tech. programmes with specializations in Communication Engineering and Power & Control. In 2015, the department has started one new M.Tech. programme with specialization in RF & Photonics.

The department offers M.Tech in following specializations:

- Signal Processing and Machine Learning
- VLSI and Nanoelectronics
- Power Engineering.
- Systems, Control and Automation
- Communications Engineering
- Microelectronics, Photonics and RF Engineering

# Dual[MS(Engg.)+Ph.D]

The department of Electrical and Communication Engineering has started the Dual [MS(Eng.) + PhD] degree program from July 2015.

The program has been started to expand the scope of research focus offered in the PhD program covering all the major areas of faculty expertise that include Signal Processing, Communication Systems, Computer Networks, Control Systems, Biomedical Signal Processing, Image Processing & Computer Vision, Instrumentation, Multimedia Security, Power Electronics, Power Systems, RF and Microwaves, Speech and Handwriting Processing, VLSI Systems and MEMS.

# Ph.D Program

The Ph.D. program is aimed at developing creative thinking, mathematical modelling and problem solving abilities of the students by posing them unsolved research issues in their areas of interest. The students admitted to this program will be pursuing research work in their areas of interest under the supervision of one or more faculty of the department.

The students in Ph.D perform research in various areas of faculty expertise which include Biomedical Signal Processing, Communication Systems, Computer Networks, Control Systems, Digital Signal Processing, Image Processing & Computer Vision, Pattern Recognition, Instrumentation, Multimedia Security, Power Electronics, Power Systems, Radar Signal Processing, RF and Microwaves, Microstrip Antennas, Optoelectronic and Optical Communication, Speech Signal Processing, VLSI Systems and MEMS.



# Course Structure

The department offers many courses as part of its curriculum. Below are some select courses among many others which students have taken as a part of their curriculum.

## Core courses offered in B.Tech

- Digital Communications
- Embedded systems.
- Digital signal processing
- Principles of communication
- Electromagnetic theory
- Analog circuits
- Control systems
- Measurement and instrumentation
- Semiconductor devices
- Circuit theory
- Digital circuits
- Signals and systems
- Electrical machines
- Power electronics
- Electrical power systems
- Advanced electrical engineering lab

## Core courses offered in M.Tech

- Digital IC Design
- Analog IC Design
- Semiconductor Device Modelling
- VLSI DSP
- VLSI System Design
- IC technology
- Communication system theory
- Information theory
- Probability and stochastic processes
- Probability and stochastic processes
- Wireless communication
- Data communication networks
- Detection and estimation theory
- Power Electronics Converter
- Modern Power System
- Insulation and high voltage engineering



# Course Structure

The Institute offers a diverse range of department electives and labs to provide students with a comprehensive and practical learning experience. These electives and labs allow students to delve deeper into specialized areas of study and gain hands-on experience in their chosen field. Here are some highlights of the department electives and labs available at IITG:

## Department Electives offered

- Biomedical signal processing
- Advanced topics in signal processing
- Advanced photovoltaics
- Speech technology
- Silicon photonics
- Power electronic systems for electric vehicles
- Pattern recognition and machine learning
- Radio frequency integrated circuits
- Image processing
- Modelling and simulation of advanced nanoscale devices

## Labs offered to the students

- VLSI Lab I, II, and III.
- Communication System Simulation Lab
- Photonic and Microelectronics Laboratory
- Communication System Design Lab
- RF Laboratory
- Power Electronics Laboratory
- Applied Control & Automation Lab
- Machine Learning Laboratory
- Digital Signal Processors Lab





# RESEARCH GROUPS

The primary objective of the Department is to impart education and training at the undergraduate, postgraduate and research levels on electronics & communication engineering and electronics & electrical engineering with special emphasis on design aspects of electronic systems. The emphasis on the design aspects implies that, while the basic theoretical and analytical skills of the students are adequately developed, the programmes are oriented in such a way that students acquire an overall design perspective and aptitude.

The faculty members and the students of the Department of Electronics and Electrical Engineering (EEE) carry out research in all the areas related to EEE. The Department has a sizeable number of M.Tech, PhD and Dual degree [MS+PhD] students actively engaged in research. Sponsored research projects have been undertaken in collaboration with the government and reputed private organizations. The research activities in the Department are broadly identified under the following groups:

- Communication Engineering
- Signal Processing and Machine Learning
- Systems, Control and Automation
- VLSI & Nanoelectronics
- Power Engineering
- Microelectronics, Photonics and RF Engineering



# Communication Engineering

## RESEARCH AREAS:

- Wireless Communications
- Orthogonal Time Frequency Space (OTFS) Modulation
- Information Theory
- Intelligent reflecting surfaces
- Error Correcting Codes
- Spectrum sharing techniques
- Communication Networks
- Adaptive and Statistical Signal processing
- Computational Photography
- Low complexity multiple antenna diversity techniques
- Data Compression and Cryptography
- Non-orthogonal Multiple Access
- Quantum Error Correction and Communication
- Cooperative communication, multi-hop relaying systems
- Vehicular Communications
- Cell-free Massive MIMO Systems
- AI/ML application in communications
- Ultra-dense Networks (UDN)
- Adversarial Machine Learning
- Edge Computing enabled Networks
- Massive MIMO
- Wireless communication with UAVs
- Cognitive radio
- Wireless energy transfer





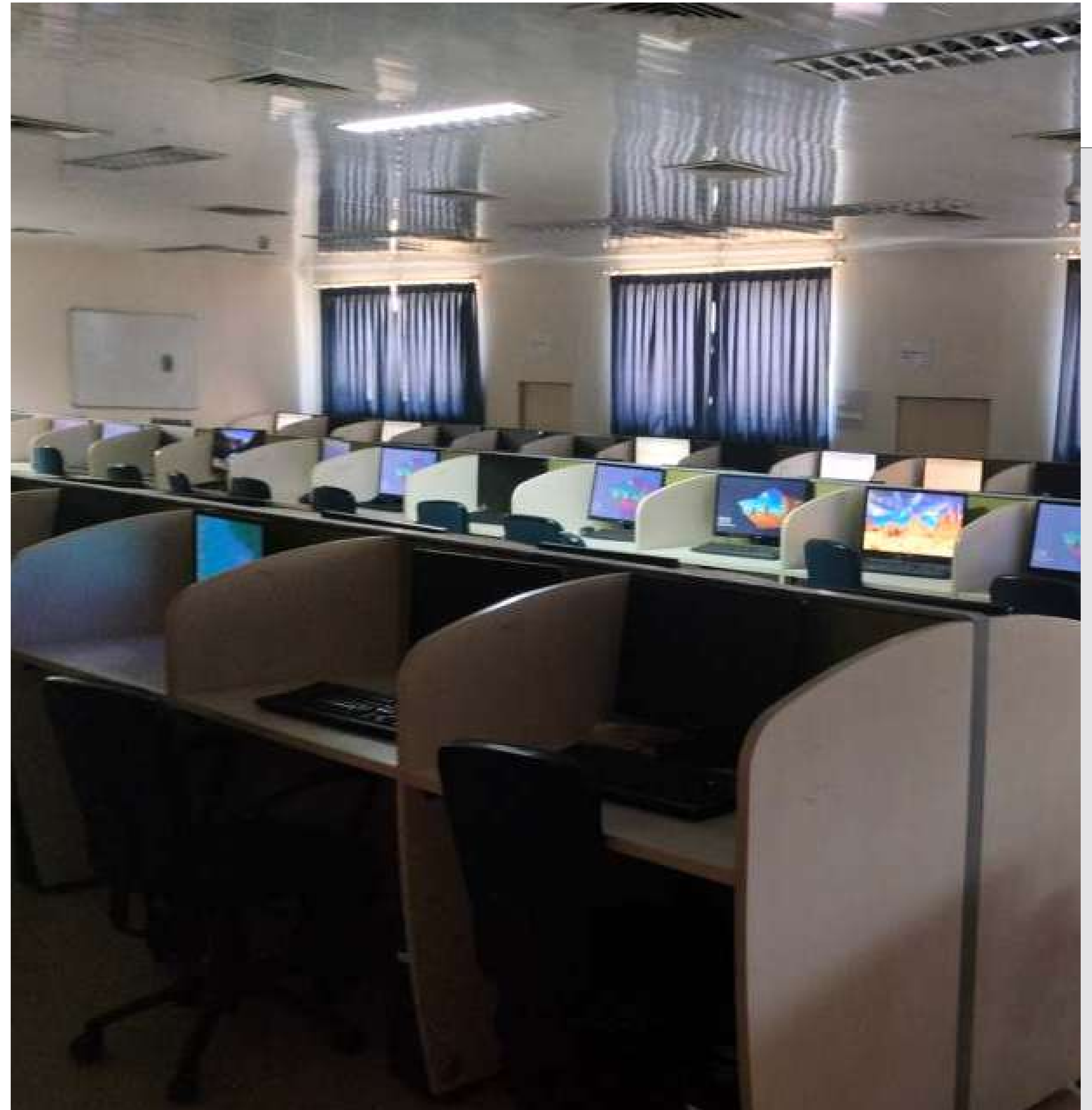
# Signal Processing and Machine Learning

The Signal Processing and Machine Learning (SPML) group in the EEE Department of IIT Guwahati is one of the oldest research groups of the institute. It excels in different domains of signal and image processing.

## RESEARCH AREAS:

- Data Science
- Deep Learning
- Biomedical Signal Processing
- Medical Image Processing
- Speech Processing
- Natural Language Processing
- Biometrics
- Wireless Sensor Networks
- Smart City

The group carries out both theoretical research and developmental works in collaboration with many foreign universities and industries. It publishes in top-notch research journals and conferences, where it has disseminated solutions to critical signal processing and machine learning problems, which are at par with the top universities in the world.





# Systems, Control and Automation

Variations on the relay method have become a de facto standard for commercial auto-tuning controllers. Commercial autotuners can be found in single-loop and multi-loop controllers, distributed control systems, programmable logic controllers, and PC-based controllers. Auto-tuning controllers from the DPR900 single loop controller introduced by Fisher Controls in 1987 through the Intelligent Tuner of Fisher's legacy distributed control system Provox and the present-day DeltaV Tuner use the Åström-Hägglund technique.

Our research on relay based tuning methods has yielded several online-tuning techniques that obtain more accurate results than the Åström-Hägglund technique without disrupting process operations during the autotune experiments. So far, the research has resulted in a patent application and a good number of publications in national and international journals/conferences.

## RESEARCH AREAS:

- Systems Theory
- Control Theory and Applications
- Control of Nonlinear Uncertain Systems
- Artificial Intelligence based Control
- Identification and Control of Nonlinear Systems
- Relay Based Identification and Auto-tuning
- Adaptive Control
- Optimal Control
- Robotics and Automation
- Cryptography
- Robust Control
- Cooperative Control of Multi-agent Systems





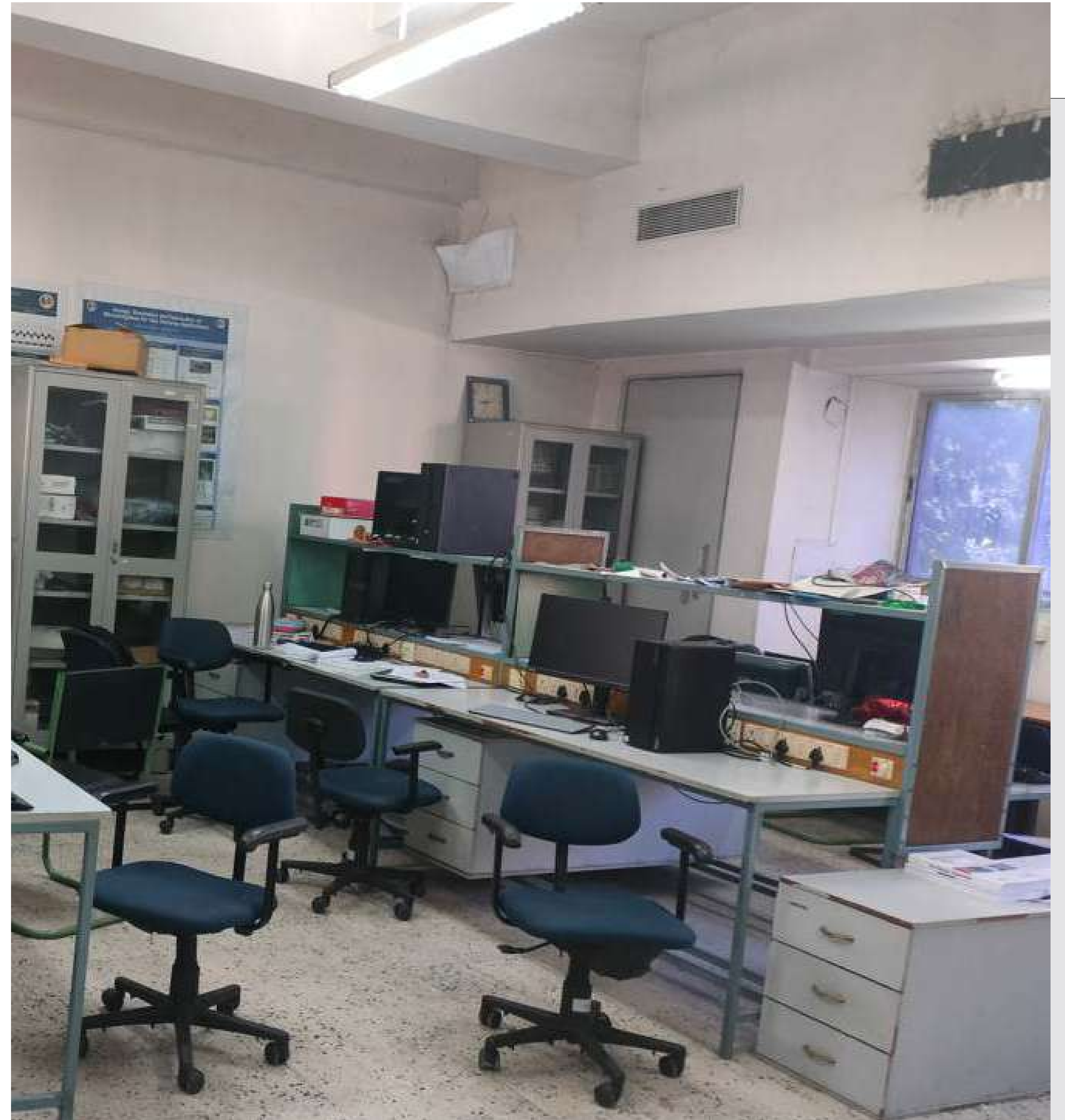
# VLSI & Nanoelectronics

The VLSI and Nanoelectronics group work on large-scale circuit and device integration technologies such as VLSI, ULSI, WSI, SoC, 3D-IC primarily, which integrate billions of transistors on a single semiconductor chip, creating integrated circuits (ICs).

Faculty members of the group are actively involved in several high-value projects of national importance funded by government agencies and private industries such as DST, SERB, MoE, MeitY, SRC, DRDO, ISRO, MSDE, United Nations Development Programme (UNDP), Asi@Connect, ARM Embedded Technologies Pvt Ltd, Nvidia Graphics Pvt Ltd, Intel Technologies etc. They are also associated with several interdisciplinary research groups at IIT Guwahati including in Centre for Intelligent Cyber-Physical Systems, Centre for Nanotechnology, School of Energy Sciences and Engineering, School of Health Sciences and Technology, etc.

The group majorly works on:

- Analog and RF IC Design
- Digital Circuits and Systems
- VLSI CAD
- High Performance Computing
- Hardware Security
- DSP Architectures
- VLSI System Design
- Spintronics
- Nano Sensors
- SAW Devices
- Photovoltaics
- Flexible/Wearable Electronics
- Neuromorphic Computing
- III - V Compound Semiconductors
- Memory Technology
- New and Quantum Materials





# Power Engineering

Power Engineering Group is a part of Department of Electronics and Electrical Engineering (EEE) at Indian Institute of Technology Guwahati, India. Faculty members of this group work in different areas, such as Power System, Power Electronics, High Voltage, Microgrid, Electric Vehicles, Power Quality, etc.

The Power Engineering department at the Indian Institute of Technology Guwahati (IITG) is renowned for its extensive range of Research and Development (R&D) labs, fostering innovation and cutting-edge advancements in the field. These labs provide an exceptional platform for students, faculty, and researchers to collaborate and explore emerging technologies in power systems.

- Power Electronics Laboratory
- EML: e-mobility Laboratory
- Smart Energy Conversion Laboratory
- Electrical Machine Laboratory
- High Voltage Power Engineering Lab
- Power System Laboratory
- Power & Control Lab-I (R&D) & Power & Control Lab-II (R&D)





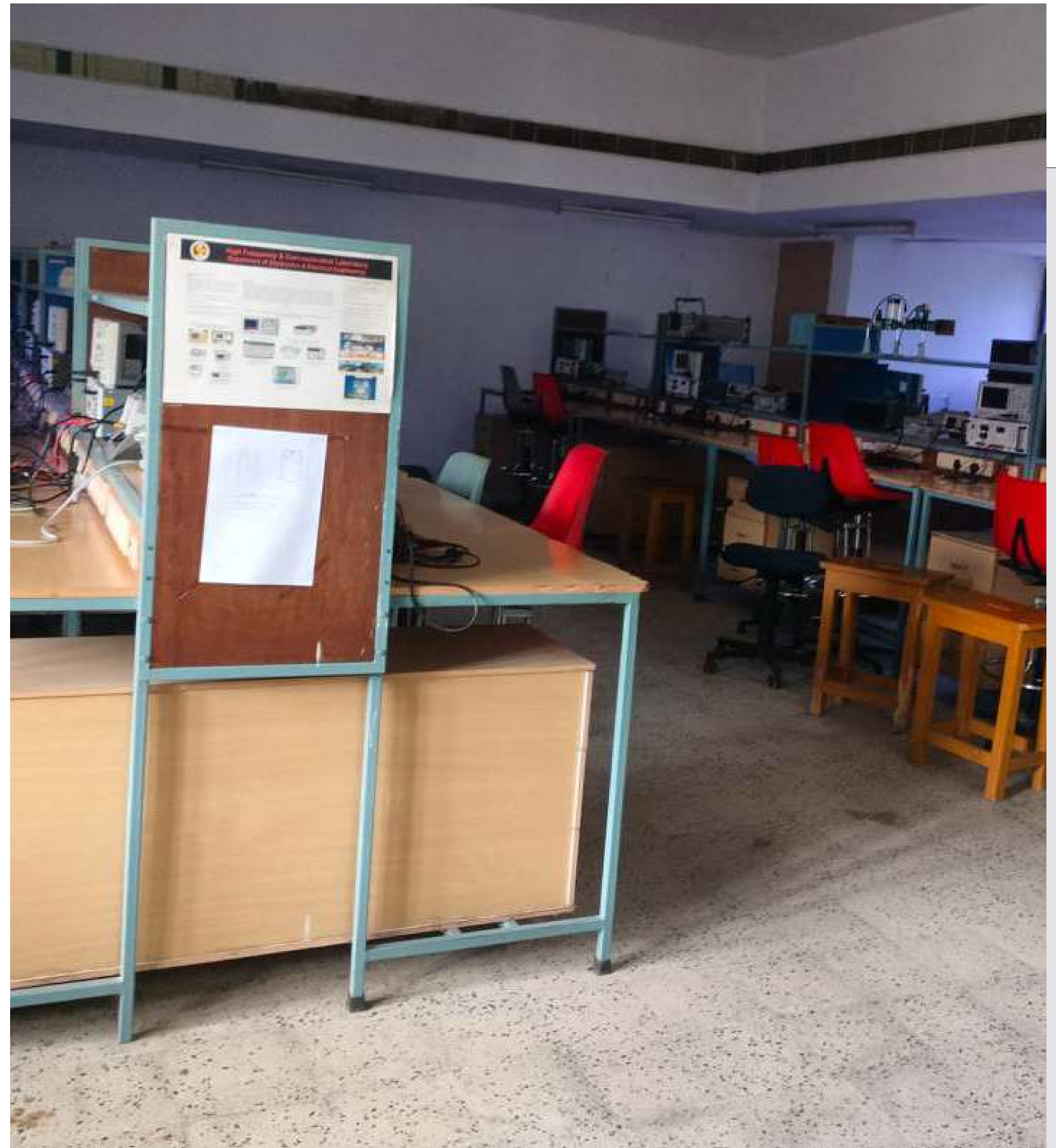
# Microelectronics, Photonics and RF Engineering

The group majorly works on:

- Optics Metrology
- Opto-Electronics
- Silicon-Photonics
- THz Devices
- RF and Microwave
- Micro-Electronics

RESEARCH AREAS:

- Silicon Photonics
- Fiber Amplifier
- Integrated Nanophotonic devices
- Nano-optical and Tunable Metadevices
- Electrotunable Smart windows
- SSPP/SIW based antenna
- SSPP/SIW based microwave device
- Wireless communication (5G and beyond)
- MIMO Wireless Communication
- UWB Wireless Communication
- OAM Communication
- RF Metamaterials for MRI applications
- RF Circuit Design
- Terahertz Devices
- Optical Modulators
- Optical Metrology
- Digital Holography
- Speckle Interferometry
- Fringe Projection Profilometry
- Optical Wireless Communication





# SPONSORED PROJECTS

**MRPF**

TITLE OF PROJECT	INVESTIGATORS	SPONSOR
Generation of non-diverging circular airy orbital angular momentum beams for next generation wireless communication technology	A. Sawant	SERB
iDT-NaPaMeGs: Inverse design tool for nanoparticle meta-grid based photonic devices using computational electromagnetics and deep learning	Dr. Debabrata Sikdar, Dr. Prithwijit Guha	National Supercomputing Mission.
Design and Development of a Digital Holographic Microscopic Imaging System for Detection and Recognition of Underwater Microorganisms and Particles	Dr. Rishikesh Kulkarni, Dr. Prithwijit Guha, Dr. Ravindranath Adda	IIT Guwahati Technology Innovation and Development Foundation(NM-ICPS Underwater Exploration)

For a complete list of projects, visit <https://www.iitg.ac.in/eee/projects.php>



# POWER ENGINEERING

TITLE OF PROJECT	INVESTIGATORS	SPONSOR
Operation and control of parallel power converters for stable, efficient and continuous operation of electric grid	Dr. Chandan Kumar	Indian Institute of Technology Guwahati, Guwahati, India
Design, control and management of distributed generation in microgrid	Dr. Chandan Kumar, Saad Mekhilef (University of Malaya, Malaysia) and Prof. HB Gooi (Nanyang Technological University, Singapore)	ASEAN-India Science & Technology Development Fund DST, Govt. of India.
Development of Energy Management Strategies for Smart Transformer Based Microgrid System	Dr. Chandan Kumar	Ministry of Electronics and Information Technology, India
Design, Operation and Control of Smart Transformer-based Microgrid System	Dr. Chandan Kumar	Department of Science and Technology, India
Design and Prototype Development of Efficient Wind-Driven Doubly Fed Induction Generator-PV Hybrid System with Smart Controller for Reliable Supply to Isolated Loads	Dr. Vijayakumar K, Prof. R A Gupta, Dr. C Periasamy, Dr. Chandan Kumar	Ministry of New and Renewable Energy, India
Development and performance analysis of Nano fluid based dielectric fluid as an insulant and coolant in power transformers.	Dr. Sisir Kumar Nayak, Prof. S.K. Dwivedy (Mechanical Engg, IIT Guwahati), Prof. N. Sahoo (Mechanical Engg, IIT Guwahati)	Department of Science and Technology, India



# VLSI DOMAIN

TITLE OF PROJECT	INVESTIGATORS	SPONSOR
Design and Implementation of a Blind Assistance System using FPGAs and Sensors	Prof. R.P.Paily, Dr. H. B. Nemade , Ms. Josephine S	DIT
Establishment of new National MEMS Design Centres	Prof. Roy Paily P	Aeronautical Development Agency, Banaglore
Design, fabrication and testing of low analog front-end chip for heart rate detection	Prof. Roy Paily P	DST, Govt. of India.
Digital VLSI Design Virtual Lab	Prof. Roy Paily P	Under the National Mission on through ICT
Development of VLSI Architectures for Digital Signal Processing Algorithms	Dr. I. Chakrabarti	MHRD
Special Manpower Development Programme in VLSI Design and related software (SMDP-II)	Prof. S. Dandapat, Prof. Roy Paily P	MIT, Govt. of India



# COMMUNICATION

TITLE OF PROJECT	INVESTIGATORS	SPONSOR
Optimal antenna selection for Intelligent reflecting surfaces aided communication systems	Sarvendranath Rimalapudi	IIT Guwahati
Integrating Massive MIMO in Dense Cooperative Cellular Deployment	Dr. Sudarshan Mukherjee	IIT Guwahati
Timing Synchronization in Cell-free massive MIMO Systems	Dr. Sudarshan Mukherjee	DST-SERB
Development of signal and channel models, circuits and antennas for next generation Wireless systems with emphasis on vehicular communications	Dr. Ratnajit Bhattacharjee	MeiTy
Efficient downloading, transmission, error correction, encryption of IRNSS data	Dr. A. Mitra, Dr. P.R. Sahu and Dr. A. Rajesh	ISRO, India
Keyword spotting in continuous speech Indo-Swiss Joint Research Project between IIT Guwahati, IIT Madras & IDIAP Switzerland	Dr. S. R. M. Prasanna, Prof. B. Yegnanarayana & Prof. Hynek Hermansky.	DST, NewDelhi.



TITLE OF PROJECT	INVESTIGATORS	SPONSOR
AI enabled advanced aquaponics ecosystem for the self-reliance of SC community in central and lower Assam	Dr. Gaurav Trivedi, Dr. Prithwjit Guha, Dr. Srinivasan Krishnaswamy, Dr. Aryabartta Sahu, Dr. Hanumant Singh Shekhawat, Prof. Pratima Agarwal	Science for Equity Empowerment and Development Division (DST-SEED)
Speech-based Multilevel Authentication System	Prof. S. R. M. Prasanna, Prof. S. Nandi (CSE Dept.), Dr. R. Sinha and Prof. S. Dandapat	DIT, Govt. of India.
Development of Phonetic Engine in Indian Languages	Prof. S. R. M. Prasanna, Prof. S. Dandapat	DIT, Govt. of India.
Design and Development of an Electronic Patient Record (EPR) System	Dr. S. Dandapat Dr. P.K. Bora	MHRD
Development of an Indian Sign Language Recognition System for Hearing Impaired Students of India	Dr. M. K. Bhuyan Prof. P.K. Bora	National Mission on Education through ICT, MHRD, Government of India.
Algorithm development for the analysis of multi-polar satellite data	Prof.A.K Mishra Prof. S. Dandapat	Indian Space Research Organization (ISRO)



# PREVIOUS RECRUITERS

accenture



AMERICAN EXPRESS



EXL

Flipkart



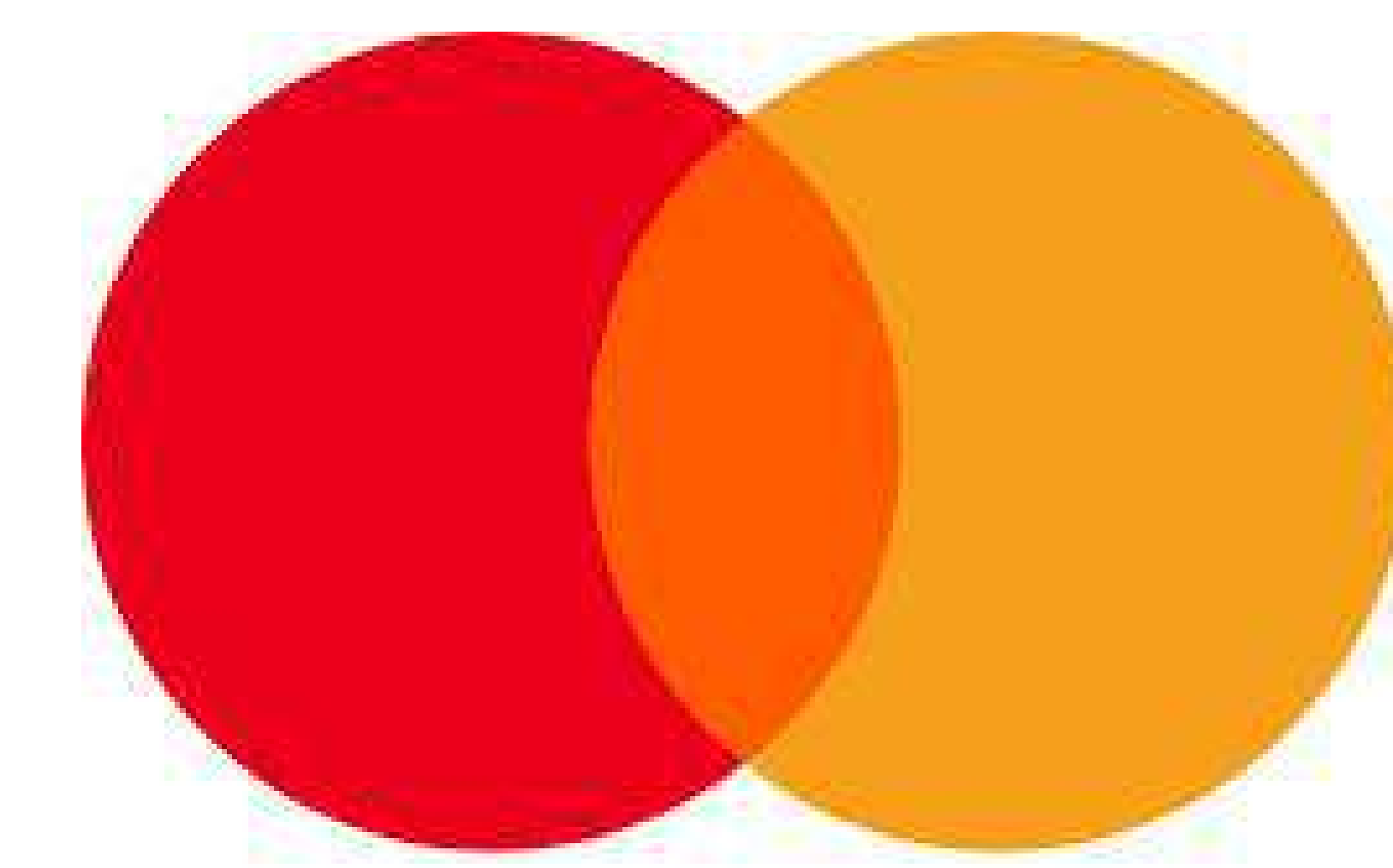
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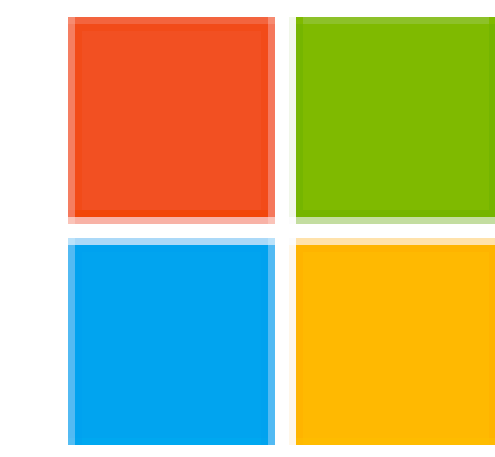
JPMORGAN  
CHASE & CO.



JUNIPER  
NETWORKS



mastercard



Microsoft



NUTANIX



ORACLE



Providence

Qualcomm

Rakuten



slice



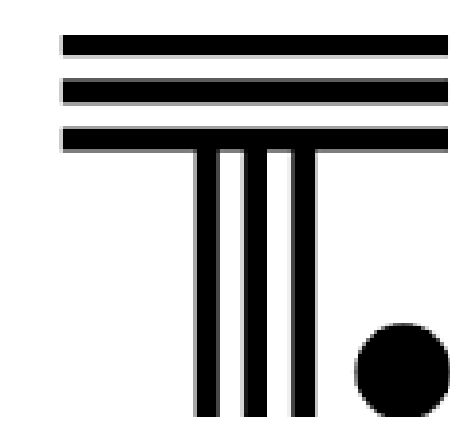
SOCIETE  
GENERALE



sprinklr

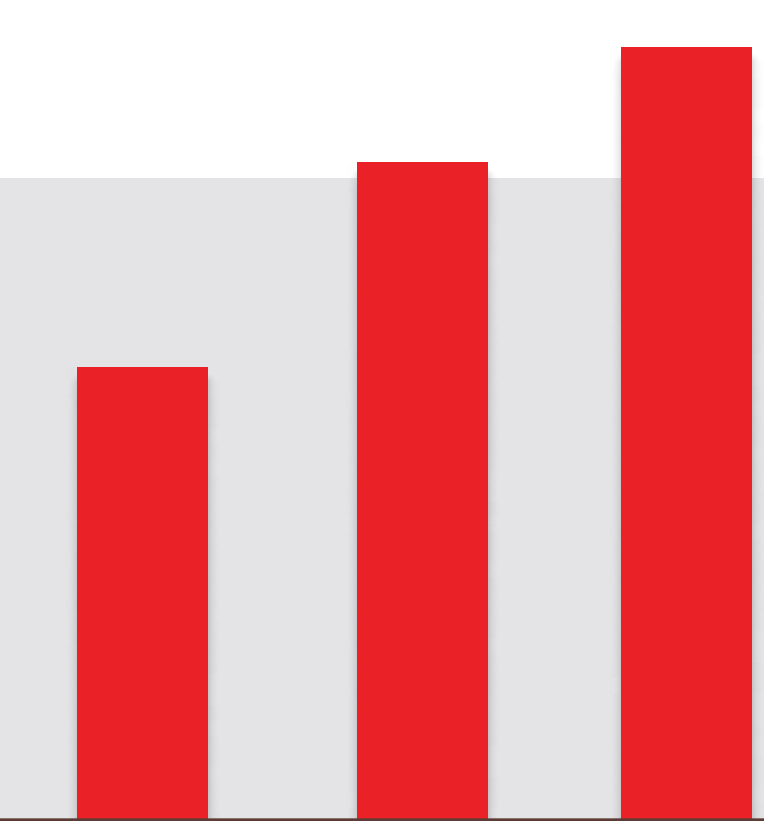


TEXAS  
INSTRUMENTS



ThoughtSpot

TIMES  
INTERNET



AND MANY MORE...



# PREVIOUS RECRUITERS FROM CORE PROFILES



Daimler Truck



*AND MANY MORE...*



# CONTACT US



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**Vatan Narang  
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## Department Placement Representatives

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