Jaypee Institute of Information Technology, NOIDA
(Deemed to be University under Section 3 of UGC Act 1956)

UDBHAAS

NEWSLETTER

उद्भास

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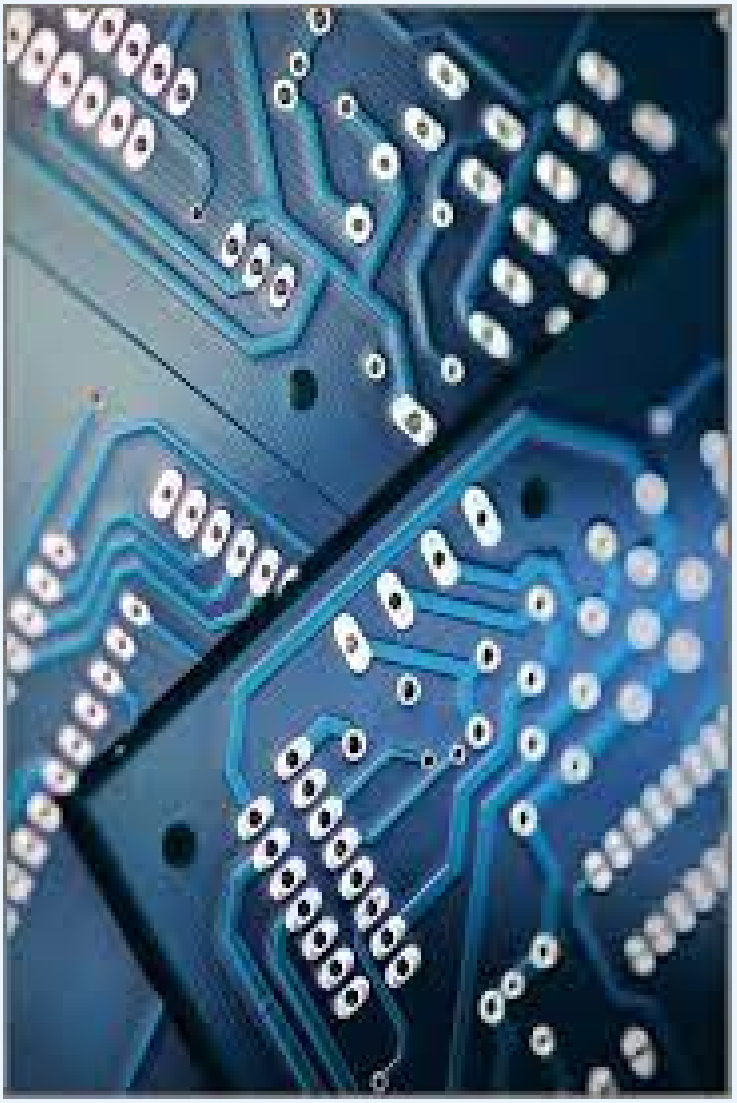
Department of Electronics and Communication Engineering

Contents



New Additions to the Department

5G Use Case Lab

In the inaugural event of Indian Mobile Congress 2023, our Honourable Prime Minister awarded 100 5G use case labs to institute across the country. JIIT Noida is the only private university among the awardees in state of UP and Uttarakhand.5G use case lab consist of IP Multimedia Core Network Subsystem (IMS) server, Multi-Access Edge Computing (MEC) server and network management system (NMS) server creating back bone network. Lab basically provides platform to create the use cases like drone uses in agriculture, security etc. The Lab is useful for both undergraduate and graduate students of the ECE department to carry out the research work.

5G Use Case Lab

The list of equipment available in the lab is as follows:

S. N.	Equipment/Devices	Product/Make Model	Name
1	5G Core	Coral Air	Coral Telecom Ltd
2	5G Radio	BRIC7401	Resonous Technologies Pvt Ltd
3	IMS solution	R760xs	DELL/ Coral Telecom Ltd
4	MEC & Application server	R760xs	DELL/ Coral Telecom Ltd
5	NMS(with Dashboard)	Coral NMS	Coral Telecom Ltd
6	Router with Firewall	NFRxG	Cosgrid Networks
7	5G SIMs	Standard	
8	5G Evaluation Board/ Hardware and Software Development Kit.		Coral Telecom Ltd
9	IoT Gateway	IG4xG	Cosgrid Networks
10	IoT sensors with analytics software (Loaded in Application server)	Coral GYAN	Coral Telecom Ltd
	Temperature & Humidity sensor	Standard	
	Light sensor	Standard	
	Soil sensor (NPK)	Standard	
	Water (TDS/chlorine) sensor	Standard	
11	5G Mini Drone	SUPARNA	Menthosa Solutions
12	5G XR(AR/VR/MR) headset or Device (with loaded application such as remote maintenance training/skill development/ education etc.)	NXGXR2205	Ajnalens
13	5G Indoor CPE	KAP510	Kenstel Comm. Pvt Ltd

5G Use Case Lab

The list of equipment available in the lab is as follows:

14	5G Camera with AI enabled Video Analytics (Face/Object/Motion detection, people counting etc.)	SC-IS 22 BP (Sparsh)	(Sparsh)Samriddhi Automations Private Limited
15	5G Handsets	Galaxy F23 5G	Samsung
16	Adjustable Tripod Pole (3m)	Standard	
17	24 U Rack	27U D-link	D-Link
18	UPS 5KVA (1hr backup)	Maxipower	Uniline Energy Systems Pvt Ltd
19	32 inch FHD Display	M5 FHD	Samsung
20	L2 Managed Switch (24 port)	DGS-1250-28XMP	D-link
21	Testing & Tracing Tools	Coral ANANT	Coral Telecom Ltd

New Additions to the Department

VLSI Fabrication Lab:

A Quantum Leap Towards India's Semiconductor Future

We are proud to announce that our own cutting-edge very-large-scale integration (VLSI) fabrication lab, a significant stride forward in our commitment to advancing semiconductor education and research is equipped for use. This new facility not only enhances Electronics and communication department's capabilities but also aligns with the objectives of the India Semiconductor Mission (ISM), aiming to make India a global hub for semiconductor design, manufacturing, and innovation. This is a game-changing addition to ECE department's resources, specifically designed to enhance the educational experience of our undergraduate students.

Students Using Sputtering System for thin film deposition

VLSI Fabrication Lab:

A Quantum Leap Towards India's Semiconductor Future

About the VLSI Fabrication Lab

This state-of-the-art VLSI Fabrication Lab is equipped with the latest in semiconductor manufacturing technology. This facility provides unparalleled opportunities for students and researchers to engage in the design, simulation, and fabrication of integrated circuits (ICs), fostering innovation and skill development crucial for the semiconductor industry.

Aligning with the India Semiconductor Mission:

The India Semiconductor Mission is a visionary initiative by the Government of India aimed at establishing the country as a global leader in the semiconductor and electronics sector. Launched to drive the nation's self-reliance and economic growth, ISM focuses on developing a robust semiconductor manufacturing ecosystem, fostering research and innovation, and creating a skilled workforce capable of meeting global industry demands.

As part of this mission, substantial investments are being made to build world-class semiconductor fabs, design units, and R&D facilities across the country. The ISM is also committed to creating policies and frameworks that support startups and MSMEs in the semiconductor domain, ensuring a thriving and competitive industry landscape.

Key Features of the Lab:

Advanced Equipment: Our lab houses industry-grade equipment, including laser writer systems, deposition tools such thermal evaporator sputtering, and sophisticated testing and measurement instruments. This ensures that our students and researchers can work with the same technologies used in leading semiconductor companies.

Student Using Laser writer for Lithography

VLSI Fabrication Lab:

A Quantum Leap Towards India's Semiconductor Future

The list of equipment (hardware and software) is as follows:

Fabrication Facilities Available with the VLSI Fabrication lab of Department of Electronics and Communication

Generic Name of Equipment	Model, Make & Year of Purchase	Remarks Including accessories available and current usage of equipment
Sputtering	Hind High Vacuum Systems	for material growth
Thermal Evaporator	Hind High Vacuum Systems	
Spin coating unit		
Furnace for Oxidation and doping	ANTS Innovation	for characterization
Laser Writer	Lab India Instruments	
I-V/C-V characterisation system	Agmatel Instruments	

Details of Software		
S. N.		
1	Mentor Graphics EDA Tool	
	Synopsis EDA Tool Suit	Front End Universal Bundle(3900)
		Back End University Bundle(3901)
2		Full Custom University Bundle(3902)
		3D [Advance] TCAD University Bundle(4458)
	COMSOL	Multi-physics, Single User CPU
3		MEMS Model for Use with COMSOL
4	VIVADO System Edition SDSOC with ZED Board	
5	CADENCE VIRTUSO	

Projects and MoUs

The projects and MoUs are listed below:

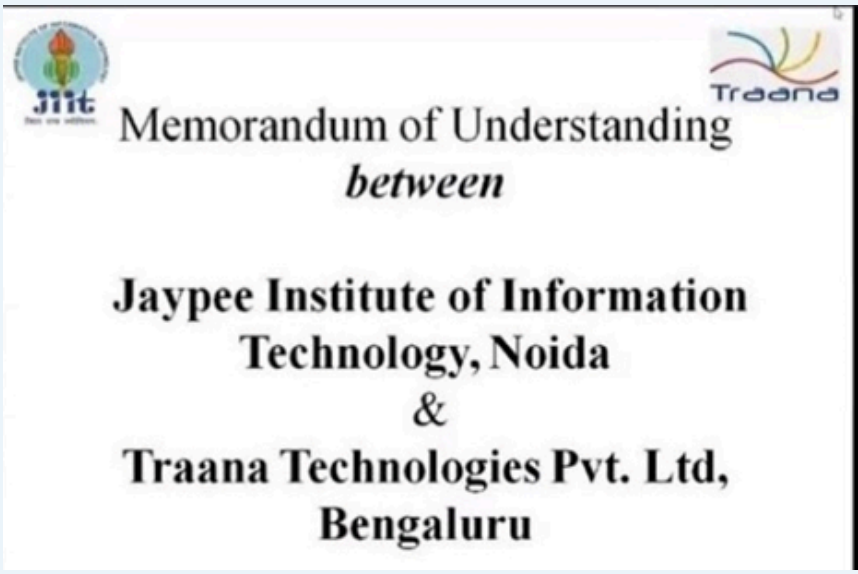
1. AI-ML Cloud-based Real-time System for Dust Suppression in Coal Mines.An MoU between the Department of ECE, JIIT and Garuda UAV inked for providing internship and employment to students in the field of AI-ML & IOT. Currently ly JIIT in collaboration with Garuda UAV working on a project "AI-ML cloud-based real-time comprehensive autonomous system for monitoring and suppression of dust particles and hazardous gases in coal mines using UAV", for COAL India. The project got a sanction of 1.47 Cr from GOI. The project basically addresses the issue of dust generation open cast coal mines. Here using UAV and ground based sensors along with LORA the PM level will be sensed and the data will be sent to a control centre, where data will be used to train an AI-ML based system so that precise action to prevent dust suppression can be taken in real time.

2. An MoU was signed between Bobble AI and Machine Leaning lab of ECE department of Jaypee Institute of Information Technology (JIIT), Noida on 26.07.2023. The objective of this MoU is to promote collaborative research and to provide industrial exposure to students. Currently there are 12 pre-final students working on industry problems related to Computer Vision and Natural Language Processing. Out of the 12 students, two students completed their project and have been offered paid internship at Bobble AI, Gurgaon.

3. TDR foundation is an NGO involved in the development of innovative technologies across different verticals. The MoU is to begin immediate collaborative work between TDR foundation and faculty/ members/Ph. D scholars/students of electronics and communication department of JIIT Noida. The first consultancy project will be on FPGA firmware coding to implement patented Z mod concept for broadcast and communication applications.

Projects and MoUs

4. After a personal visit of Mr Deepak Chandrashekaran (Director and CEO) and Mr Avtansh Sharma (Director and SVP Business) of Traana Tech. Pvt Ltd., Bengaluru to Department of Electronics and communication Engineering, JIIT Noida, and subsequent discussions, there was an agreement for a consulting project titled "Design of Short Range High Gain MIMO Antenna for X band Radar Surveillance applications" between JIIT Noida and Traana Tech. Pvt. Ltd. It was proposed by Traana and agreed by JIIT to design and test MIMO antenna setup with 4 transmitters and 16 receivers for X band radar applications. Thereafter, an online MoU meeting was held between Mr Deepak, Mr Avtansh from Traana Tech Pvt Ltd and Prof Bodh Raj Mehta (Vice Chancellor), Prof. Shweta Srivastava (Dean A & R II and HoD, Department of ECE), Dr Abhay Kumar (PI), Department of ECE, Dr. Nitin Muchhal (PI), Department of ECE on 17 Aug. 2023



5. An MoU between ESNIFF Devices Private Limited & Research Innovation Development and Entrepreneurship Society (RIDE Society) has been signed in the 1st week of April 2024. The MoU has been done to develop "Software Interface based on python to control the peripherals (such as FAN, sensors) connected to the Microcontroller hardware for collecting the odor sample of different edible items". Till now a basic idea has been implemented and the final outcome of the project is to be achieved soon.

Patents

S. N.	Patent Application No. (PAN)	Patent Title	Author	Status
1	202111032091	A Cavity Based Multi Resonant Piezoelectric Energy Harvester With One Straight and Two L-Shaped Branshes	Shradha Saxena, Prof. R. K. Dwivedi and Dr.Vijay Khare	Granted 07.03.2024 Number: 521931
2	202111005099	Rice Palanting Robot	Dr.Vimal Kumar Mishra, Mr. Vaiabhav Mishra, Mr. Abhinav Chaudhary and Shivangi	Granted 30.05.2024 Number 540236
3	202011040618	Cavitation Noise Rejection Using Air As Discontinuity In Underwater Measurements	Dr.Kapil Dev Tyagi	Granted 15.03.2024 Number 527882
4	201911048307	Direction of arrival estimation using single sensor and reflector for acoustic pulse source.	Dr. Kapil Dev Tyagi	Granted 04.12.2023 Number: 476723




Publications (April-June 2024)

1	Varun Goel, Yogesh Kumar, Gopal Rawat, and Hemant Kumar. “Self-Powered Photodetectors: A Device Engineering Perspective.” Nanoscale, April 9, 2024. https://doi.org/10.1039/D4NR00607K.
2	Rajni Parashar, Garima Kapur, "A gyrator-C active inductor based tunable low noise amplifier for sub-GHz frequency range", Engineering Research Expresses, Vol. 6, 025325, April 2024.
3	Garima Kapur, "CMOS Based Voltage Reference Designs for Sub 1V", J.ElectricalSystems20-3, pp.1309-1316, May 2024.
4	K. Sagar, A. Kumar, Novel silicon nanoparticle-based optical sensor to confin bloch surface wave for optical applications. Opt Quant Electron 56, 981, May2024. https://doi.org/10.1007/s11082-024-06840-7
5	R.Gupta, A. Kumar, M. Kumar, R. Singh, A. Gehlot, PS Pandey, N. Yadav, K. Pandey, A. Yadav, N. Gupta, R. Brajpuriya. The integration of microelectronicand photonic circuits on a single silicon chip for high-speed and low-power optoelectronic technology. Nano Materials Science. 2024 May 10.
6	A Jain, A Kumar, N Gupta, K Kumar. Advancements and challenges in BaTiO3-Based materials for enhanced energy storage. Materials Today: Proceedings. 2024 May 11.
7	A Jain, R Saroha, A Kumar, N Gupta, K Kumar. Advancements and challenges in solid-state lithium-ion batteries: From ion conductors to industrialization.Materials Today: Proceedings. 2024 May11.
8	VS Rajawat, B. Choudhary, A. Kumar. Performance Assessment of High-k SOI GaN FinFET with Different Fin Aspect Ratio for RF/Wireless Applications. Wireless Personal Communications. 2024 Jun 25:1-6.
9	N. Gupta, R. Gupta, A. Jain, R. Gupta, B. Choudhary, K. Kumar, A. K. Goyal, Y. Massoud, A. Kumar. Lead-free perovskite Cs2NaGaBr6 n-i-p solar cell for higher power conversion efficiency to improved energy storage performance. Energy Storage. June 2024; 6(4):e665.doi:10.1002/est2.665

Publications (April-June 2024)

10	R. Gupta and J. Gupta, “Privacy and convergence analysis for the internet of medical things using massive MIMO,” e-Prime - Advances in Electrical Engineering, Electronics and Energy, Elsevier, Apr. 2024.
11	Shivani Sharma, Rishibrind Kumar Upadhyay, Nidhin S. Babu, Satinder K. Sharma, "Solution processed highly UV sensitive photodetector based on sub 5 nm Sn nanoparticles blended with TiO2 nanofibers", Journal of Alloys and Compounds, Volume 1001, p.75096, June 2024
12	Rakhi Kumari and Shweta Srivastava, “Four Port MIMO Antenna on Quarter Mode Substrate Integrated Waveguide for Ku Band Applications”, Progress In Electromagnetics Research M,Vol. 127, 113-120, June 2024.
13	V. Goel and H. Kumar, "A Study of Pyro-Phototronic Effect in ZnO/CdSe Colloidal Quantum Dots-Based Self-Powered Photodetectors," in IEEE Transactions on Electron Devices, June 2024, doi: 10.1109/TED.2024.3408775.
14	A Upadhya and Anu Goel, "Satellite backhaul for enhancing reliability of the mixed FSO/RF downlink systems with interference and hardware limitations”, Journal of Optics, Springer, June 2024. 10.1007/s12596-024-01836-8.
15	A Goel, R Bhatia, A Upadhya. Practical downlink satellite-FSO/RF cooperative relays: Performance analysis and LSTM prediction. Int J Commun Syst. June 2024 e5881. doi:10.1002/dac.5881
16	A. Kumar, B. Chaturvedi, S.Jagga,“High-Performance MOS-C Realization of Mixed-Mode Third-Order Sinusoidal Oscillator”, Journal of Circuits, Systems and Computers, Vol. 33(09), pp. 2450159, June 2024.
17	Conferences M. Jha, R. Gupta and R. Saxena, "Synthesis of Wilms tumor images using Generative Adversarial Networks," 2024 11th International Conference on Signal Processing and Integrated Networks (SPIN),Noida, India, 2024, pp. 89-92, doi: 10.1109/SPIN60856.2024.10511789.

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