INDRAPRASTHA INSTITUTE *of*
INFORMATION TECHNOLOGY **DELHI**

DEPARTMENT OF ELECTRONICS &
COMMUNICATIONS ENGINEERING

ELECTROBUZZ

OCTOBER 2021



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HOD'S MESSAGE



Dear All,

After a challenging year of coping with the pandemic, things are looking up. Vaccination rates are skyrocketing, and our campus is beginning to fill up. Students have started returning to the hostel, the canteens are full, and research labs are humming with activity again.

We will shortly be holding our convocation for the 2019 M.Tech and 2017 B.Tech batches. The placement news is extremely positive. Despite the Covid challenges, over 92.% UG and 86% PG students have been placed. Our students have joined M.Tech and PhD programs in highly reputed universities across the globe. The complete details of our graduating batch are provided in the newsletter. We were delighted to informally interact with some of our Delhi based students from the graduating M.Tech and B.Tech batches last week. Photographs from the event are shared in this newsletter.

From a research perspective, too, we have lots of exciting news to share. ECE will be hosting the newly inaugurated Center of Sustainable Mobility headed by Dr. Pravesh Biyani. The Center supported by the Delhi Knowledge Development Foundation under the Delhi Govt's transportation department will focus on researching sustainable urban transportation solutions for residents of the NCR region. We have signed an MOU with Thales, France, for collaborative research and development in diverse areas such as edge computing, smart manufacturing, defence and space. Dr. Sujay Deb will be spearheading the collaborations. Research news and highlights are shared in the newsletter.

Our faculty and students are winning accolades and awards around the globe. Students are getting their research work published in leading journals and presenting them in prestigious conferences worldwide. Ms Bushra Ansari, a PhD student supervised by Dr Sanat K Biswas, was an invited speaker at the UN/Symposium organised by the United Nations Office of Outer Space Affairs. These are just the top of the can full of achievements. All student achievements follow in the newsletter.

All in all, it has been an extremely productive year under challenging circumstances. I hope the lessons of resilience, courage and cooperation, this last year will serve us long going forward.
I extend my very best wishes to all our readers.

Sincerely,
Shobha
Associate Professor(ECE Dept.)
HOD, ECE Department



FROM THE
EDITOR'S DESK

Dear readers,

A heartily welcome to the 4th edition of Electrobuzz, the student-run ECE magazine of IIITD.

I hope you and your families are doing well. If we look back, this year has been a revelation of sorts. Just when everything was finally starting to open, the second wave of Covid19 began. It was much potent and deadly than the first one, and the nation suffered huge losses. But we rose and how. The vaccination drive is progressing well, and it is only time before things return to normal.

We have not only fought Covid19 but also climate change crisis, hunger, unemployment and social stigmas. The whole world is reviving, and these stories of revival inspire us the most. Be it the perseverance of frontline workers, India's first Olympics medal in Hockey in 41 years, or Greek entrepreneur Melina Taprantzi'will to provide food supplies to those in need or IIITD's fortitude to provide quality education to its students. They all teach us that it takes continuous efforts and compassion in your heart to do something good.

They make me remember C.S. Lewis's words, "True humility is not thinking less of yourselves, it is thinking of yourselves less". From getting to know each other in the first meeting to pulling all-nighters, working out the various permutations and combinations to the night of final editing and designing, this journey of one and a half months is one that never fails to amaze and humble me. I am grateful for this experience. Here are a few of those without whose support and assistance this edition would not have been possible.

Dr Shobha Sundar Ram and Ms Sanjna Khosla for the formidable belief they have shown in our team. Dr Anuj Grover for gracing us with his presence and wisdom. Dr Rahul Gupta for sharing with us his remarkable insights. Dr Deepayan Bannerjee, Dr Sri Harsha Gade, Anant Sharma, and Khalid Lodhi for sharing snippets of their incredible journeys and inspiring us all. Akunj Singh and Tathagat Pal for sharing such beautiful pictures of the IIITD campus.
Finally, to my biggest strength and accolade, my team, for believing in me and making this edition of Electrobuzz such a grand success.

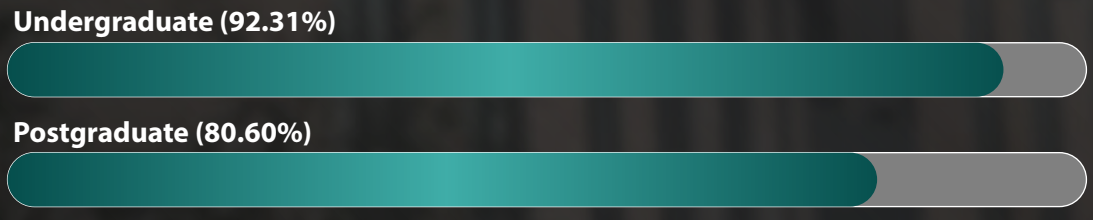
I hope you enjoy reading this edition as much as we enjoyed making this.

Warm Regards,
Abhishek Goyal
(ECE Undergraduate, Pre-final Year)

PLACEMENT HIGHLIGHTS



- 3 International Offers
- 110 A Offers (10 LPA > CTC ≥ 6 LPA)
- 361 A+ Offers (CTC ≥ 10 LPA)
- 144 Internship Offers



RESEARCH HIGHLIGHTS

AFFORDABLE A.I. FOR CANCER DIAGNOSIS

Low and middle-income countries (LMIC) generally lack an infrastructure, including medical facilities and expert oncologists, for the prompt diagnosis of deadly diseases like cancer, leading to higher casualties. Hence, a great emphasis is being laid on the development of artificial intelligence (AI)-assisted diagnosis tools that can make the required expertise accessible to populations residing in rural areas and difficult terrains. At SBILab, Deptt. of ECE, IIIT-Delhi, we are focused on the development of such AI-based affordable diagnostic tools that can be deployed in hospitals in the long run. We have been working in blood cancer diagnostics in collaboration with Prof. Ritu Gupta, Head, Laboratory Oncology, B.R.A. IRCH, AIIMS, New Delhi. We have largely focused on two cancer types: B-type Acute Lymphoblastic Leukemia and Multiple Myeloma cancers. The work is based on the analysis of microscopic images captured from the slides prepared from peripheral blood and bone marrow aspirate. So far, we have released four curated dataset, conducted two medical imaging challenges in the International conferences IEEE ISBI-2019 and IEEE ISBI-2021, a flagship medical imaging symposium of IEEE Signal Processing Society. We have also published a number of papers in high impact journals and top-tier conferences. Below are the brief details. Interested readers can also refer to the SBILab page (http://sbilab.iiitd.edu.in/resources.html) for links and other details of challenges, resources (datasets) and papers.

Books:

> Anubha Gupta and Ritu Gupta (Eds.), ISBI 2019 C-NMC Challenge: Classification in Cancer Cell Imaging. 2019, Springer Singapore.

Journals:

> Shiv Gehlot, Anubha Gupta, and Ritu Gupta, "A CNN-based Unified Framework utilizing Projection Loss in Unison with Label Noise Handling for Multiple Myeloma Cancer Diagnosis," Medical Image Analysis Journal, Elsevier, vol. 72, article no. 102099, pp. 1-40, ISSN 1361-8415, August 2021.

> Anubha Gupta, Rahul Duggal, Shiv Gehlot, Ritu Gupta, Anvit Mangal, Lalit Kumar, Nisarg Thakkar, and Devprakash Satpathy, "GCTI-SN: Geometry-Inspired Chemical and Tissue Invariant Stain Normalization of Microscopic Medical Images," Medical Image Analysis, Elsevier, vol. 65, article no. 101788, pp. 1-18, October 2020.

> Shiv Gehlot, Anubha Gupta, Ritu Gupta, "SDCT-AuxNetθ: DCT Augmented Stain Deconvolutional CNN with Auxiliary Classifier for Cancer Diagnosis," Medical Image Analysis, Elsevier, vol. 61, article no. 101661, pp. 1-15, April 2020.

> Anubha Gupta, Pramit Mallick, Ojaswa Sharma, Ritu Gupta, and Rahul Duggal, "PCSeg: Color model-driven probabilistic multiphase level set based tool for plasma cell segmentation in multiple myeloma," PLoS ONE 13(12): e0207908, Dec 2018.

Medical Imaging Challenges:

> IEEE ISBI 2021: SegPC-2021: Segmentation of Multiple Myeloma Plasma Cells in Microscopic Images Dataset (2021) (https://segpc-2021.grand-challenge.org/evaluation/final-test-phase/leaderboard/)

> IEEE ISBI 2019: CNM-C 2019: Classification of Normal vs Malignant Cells in B-ALL White Blood Cancer Microscopic Image: ISBI 2019 (https://competitions.codalab.org/competitions/20395).

Data Sets:

> Anubha Gupta, Ritu Gupta, Shiv Gehlot, and Shubham Goswami, "SegPC-2021: Segmentation of Multiple Myeloma Plasma Cells in Microscopic Images", IEEE Dataport, DOI: https://dx.doi.org/10.21227/7np1-2q42.

> Anubha Gupta and Ritu Gupta (2019). C-NMC 2019 Dataset: ALL Challenge dataset of ISBI 2019 [Dataset]. The Cancer Imaging Archive. https://doi.org/10.7937/tcia.2019.dc64i46r

> Ritu Gupta and Anubha Gupta (2019). MiMM_SBILab Dataset: Microscopic Images of Multiple Myeloma [Dataset]. The Cancer Imaging Archive. https://doi.org/10.7937/tcia.2019.pnn6aypl

> Anubha Gupta and Ritu Gupta (2019). SN-AM Dataset: White Blood Cancer Dataset of B-ALL and MM for Stain Normalization [Dataset]. The Cancer Imaging Archive. https://doi.org/10.7937/tcia.2019.of2w8lxr

ANALYSIS AND LOCALIZATION OF INDOOR COMMUNICATION SYSTEMS USING OFF-THE-SHELF LEDS WITH HUMAN BLOCKAGES

In the proposed work, we analyze an indoor VLC system in the presence of static and dynamic human blockages. The performance is demonstrated for fixed placement of LEDs in a rectangular configuration with 4 LEDs and 8 LEDsarrangement. For the realization of static and dynamic human blockages, we have used the Matern hardcore point process(MHCP) and random waypoint model (RWP), respectively. In MHCP, two or more points are separated by an absolute minimum distance to avoid overlapping between them. This also reflects a practical scenario for static human blockage wherein two or more blockages do not overlap. While the density of human blockages are independent of the room size, it may be noted that the number of blockages are directly proportional to the area of the room [1].

Furthermore, we also present a visible light communication (VLC) - based predictive system for estimating an obstacle's height and location in an indoor environment. Two types of indoor environments having one and four LEDs respectively are considered for the simulation. In each of the above environments, the system is first simulated using an infinitely thin obstacle and then using an obstacle having a radius of 0.05m. Linear Regression is applied to the results to develop a predictive algorithm to obtain the location and height of an obstacle from the received power profile. Finally, the accuracy of the predictive system for each of the above scenarios is also measured [2] [3].

Publications:

[1].
A. Singh, G. Ghatak, A. Srivastava, V. A. Bohara and A. K. Jagadeesan,
"Performance Analysis of Indoor Communication System Using Off-the-Shelf LEDs With Human Blockages,"
in IEEE Open Journal of the Communications Society, vol. 2, pp. 187-198, 2021,
doi: 10.1109/OJCOMS.2020.3048954.

[2].
A. Chakraborty, A. Singh, V. A. Bohara and A. Srivastava,
"A Visible Light Communication based predictive system for the height and location estimation of an obstacle,"
2020 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), pp. 1-6, 2020,
doi: 10.1109/ANTS50601.2020.9342785.

[3].
Y. Gupta, A. Singh, A. Bansal, V. Bohara and A. Srivastava,
"Deploying Visible Light Communication for Alleviating Light Pollution,"
2020 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), pp. 1-4, 2020,
doi: 10.1109/ANTS50601.2020.9342830.

CHIPLESS RFID:
FUTURE OF RFID IN THE FRAMEWORK OF IOT

Internet of things (IoT) is a group of competent and intelligent devices around us that are context-aware and connected according to the system requirement. Such devices could be from a multitude of spheres and include wearable devices, metering devices, and environmental sensors. IoT offers object identification, sensor, and connection capability for developing independent cooperative services and applications. IoT helps in collecting more data from these objects with better efficiency and ensures data safety and security.

IoT aims to make devices smart by connecting through wired or wirelessly communication. Smart devices, the meaning is that they can process information, self-configure, make an independent decision as per the condition. RFID Technology is the primary step in the evolution of IoT since 2000. Cost reduction, miniaturization of the devices, power-efficient electronic devices, positioning ability, remotely monitored and controlled, etc., are the different advantageous factors of RFID technology. The impact of RFID on the global scale can streamline the supply chain, monitor process behaviour,

and remotely track objects. RFID can also manage material handling, e.g., automatic material sorting, minimizes manual work, improves speed, and records the necessary parameters. RFID and IoT can also play a significant role in emergencies, such as fire and natural disasters, and enhance the safety of both human resources and materialistic things. With subsequent research and remarkable technological progress, many cheap alternatives such as Chipless RFID have come forward. Chipless RFID has a more extended range as compared to silicon-based RFID. Chipless RFID does not require

any memory chip for data storage, so the Chipless RFID cost is significantly less than chip RFID. The delay introduced in chip RFID due to memory is absent in the Chipless RFID. So the sensitivity and response time of the Chipless RFID is better than chip RFID, which will enhance the performance of the IoT system. There are different challenges associated with the Chipless RFID, such as the size of the Chipless

RFID tag compared to chip-based RFID, electromagnetic interference, reading distance, privacy and security of data, and the most important is the lack of research in proper system implementation of Chipless RFID. The majority of research focuses on the challenges mentioned above. Research on orientation independent chipless RFID tags, multibit resonator Chipless RFID tags, power-saving Chipless RFID reader, and secure data algorithms are published in different journals and conferences.

Publications:

1. V.Sharma, and M. S. Hashmi,
"Advances in the Design Techniques and Applications of Chipless RFIDs"
IEEE Access, 2021
2. V.Sharma, and M. S. Hashmi,
"On the Seamless Integration and Co-existence of Chipless RFID in Broad IoT Framework"
IEEE Access, 2021
3. V.Sharma, S. Malhotra and M. S. Hashmi,
"Slot Resonator Based Novel Orientation Independent Chipless RFID Configurations"
IEEE Sensors Journal, 2019
4. V.Sharma, S. Malhotra and M. S. Hashmi,
"Orientation Independent Printable Backscattering Chipless RFID Tags Based on L-Resonator"
IEEE European MicrowaveConference (EuMC), Madrid, Spain., Sep. 2018.



SHANNON LAB

The mark of any engineering department is by the quality of its faculty, students and labs. IIITD's ECE department is one of the best worldwide. Blessed with world-renowned faculty and talented students the department boasts of numerous labs spanning various disciplines. Equipped with the latest tools and cutting-edge technologies, the labs are utilised by both students and faculty for teaching as well research. In this edition, we will talk about one such lab - Shanon Lab

Shannon Lab is a research lab under the ECE department. The research work
encompasses research scholars, interns and students working in the areas related to Wireless
communication, Visible light communication, VLSI and Signal processing. Fully air-conditioned, 24X7 accessible, it is equipped with the latest high-end hardware and software resources. The hardware includes NI and Ettus USRPs, AVNET Zynq boards, Thorlabs LED and photodetector, power amplifiers, optical and digital communication trainer kits and a variety of FPGA boards. The Software resources include NI LabVIEW Academic suite, Xilinx Vivado and Optisystem. It has ready to work testbeds on D2D communication and Visible light communication. The lab provides support to teaching programs including experiments and project assignments related to various basic and advanced courses. The lab is managed by Mr Khagendra Joshi, Assistant Manager(JRE).

Facilities:

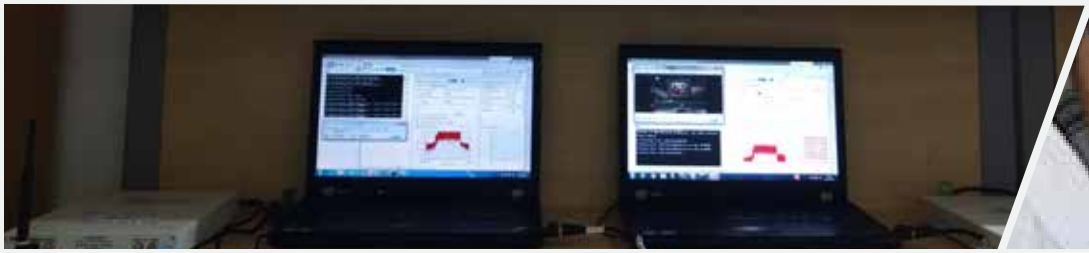
> Issue/Return facility on consumable items (Both offline and online)
> The latest licensed versions of the software like MATLAB, LabVIEW, and Optisystem
> High-end resources like NI and Ettus USRPs, Keysight's DSO and power supply, AVNET Zynq boards, Analog device's power amplifiers, Digilent FPGAs, optical and digital communication trainer kits.
> Online availability of a list of lab resources.
> Resources available on immediate requirement.
> Projector facility and Wi-Fi connectivity.
> Separate Lockers for safekeeping of issued items.
> RFID lab access to the students.
> Assistance in Course and research grant projects.

Research Projects are being conducted in the domains of:

1) Visible light communication
2) Device to device communication
3) Intelligent reflective surfaces









ELECTRIVIRE'2021

ECE labs organised a 2 day hardware design challenge on13th and 18th September 2021 to provide students with first hand experience of operating the latest hardware components.
Stage 1 was held online in MCQ format. The top 40 participants advanced to Stage 2 where they designed circuits in the institute labs under the guidance of mentors.
The top 3 participants won cash prizes worth Rs 7000. A few consolation prizes were also awarded along with participation certificates for all registered participants.

Stage I Winners

1. Ashwin Ram Natarajan
2. Jeet
3. Rakesh Kumar
3. Ishan Malhotra

Stage II Winners

1. Ajay Prakash
2. Rahul Agarwal
3. Shreyas Gupta







10th CONVOCATION HIGHLIGHTS

The institute conducted it's 10th Convocation in a virtual manner on the 16th of October, 2021

BACHELOR OF TECHNOLOGY

Institute Silver Medal: **Samarth Singhal**
All Round Performance Medal: **Khalid Lodhi**
Graduates with Honors: **Khalid Lodhi & M Badri**
Total ECE Graduates: **70**

MASTER OF TECHNOLOGY

Generalised M.Tech.: **37**
M.Tech with Specialisation in Communications and Signal Processing: **4**
M.Tech with Specialisation in VLSI and Embedded Systems: **26**

DOCTOR OF PHILOSOPHY

Total PhDs Given: 7

Dr. Manoj Gulati
Dr. Ankita Shukla
Dr. Deepayan Banerjee
Dr. Neha Jain
Dr. Sneihil Gopal
Dr. Nishtha
Dr. Rahul Gupta

Doctoral Dissertation Awardees

Dr. Ankita Shukla
Dr. Deepayan Banerjee
Dr. Neha Jain
Dr. Sneihil Gopal
Dr. Nishtha
Dr. Rahul Gupta

DEAN LIST AWARDEES
FOUNDATION DAY 2021

Research Excellence Awards

Faculty

Dr. Pravesh Biyani
Dr. Saket Anand
Dr. Ranjitha Prasad
Dr. Shobha Sundar Ram
Dr. Sumit J Darak

Students

Arjun Lakhera
Saksham Dhull
Setu Gupta

Dean's List
Academics B.Tech.
(Average SGPA for last year better than the CGPA at the start of the Academic Year)

Anmol Goyal
Varun Malik
Mahesh Kumar
Anant Vatsa
Aniket Vijayraj
Tathagat Pal
Samridh Shakya
Akunj Singh

PROF. RAJEEV SANGAL FACULTY FELLOWSHIP



Dr. Pravesh Biyani

Dr. Pravesh Biyani was awarded the Prof. Rajeev Sangal Faculty Fellowship in appreciation for his contributions towards the holistic development of students.
The fellowship was started by Prof. Ponnurangam Kumaraguru (PK) (Adjunct Faculty, IIITD) in the year 2020 and will be awarded each year to a faculty at IIIT-Delhi having a wholesome impact on students.

Dean Awards for Contribution to Society

Aniket Gupta, Batch of 2024

Dean's List
Academics B.Tech.
(Average SGPA of more than 9.00)

Garvit Gupta
Ayush Bhardwaj
Daksh Thapar
Hritik Goel
Setu Gupta
Madhur Kumar
Sarthak Chandra
Mohammad Siraj Ansari
Rishi Singhal
Samaksh Gupta
Shragvi Sidharth Jha
Tushar Agarwal
Moksh Aggarwal
Divin Dominic
Saksham Gupta
Tanuj Rana
Prashant Singh
Vishal Bansal

Dean's List
Academics M.Tech.
Average SGPA of more than 9.50

Rasaina Hossain, MTH20205

ECE GRADUATING BA











ATCH GET-TOGETHER











CENTRE FOR SUSTAINABLE MOBILITY

HEADED BY DR. PRAVESH BIYANI

"From the perspective of mobility, we are gradually moving towards an increasingly connected, autonomous, electrified, and shared future. The Centre will catalyze research, development and entrepreneurial activities in the area of smart/ sustainable mobility, with a focus on mobility-related problems of Delhi/ NCR."

~ Prof. Ranjan Bose, Director, IIIT-Delhi

To counter the challenges of traffic congestion, road accidents, pollution etc, IIITD in collaboration with the Delhi Knowledge Development Foundation (DKDF) has established the 'Centre of Sustainable Mobility' as a Centre of Excellence at the Institute. The aim of the new research centre will be to design and develop systems to solve problems of urban transportation in the national capital.

On 1st April 2021, Dr Pravesh Biyani, associate professor in the ECE department was appointed the Faculty in Charge of the Centre for Sustainable Mobility. Upon his appointment, Dr Pravesh has said, "We(Dr Pravesh and his team) have been engaging with DTC, DIMTS and the transport department for 3 years. We have successfully executed the country's biggest real-time open data project as well as a contactless ticketing project that is now rolled out in all the buses of Delhi. We hope to take our engagement to the next level through this centre. We also hope that the technologies we build here are used not only in India but throughout the world. The main goal of this centre is to promote public transit as much as we can."

Building on this foundational and exemplary work, the centre will strive to further enhance public transit and prevent road accidents. Better public transit infrastructure will help reduce pollution levels in Delhi by removing cars from roads and prompting people to use public transit. The problem of sustainable mobility is a complex one which requires design and optimisation, relying on data analytics and interdisciplinary research that includes computer science, AI, electronics engineering as well as design. With faculty members specialising in various research areas across these disciplines, IIITD provides an adequate infrastructure with world-class facilities and cutting-edge technology to aid such advanced research and learning.

The centre will also open new avenues and courses for training students in the field of public transportation, electric vehicles as well as road safety. There is a greater need for the new age courses to be connected to the SDG goals of the United Nations.

IEEE SIGNAL PROCESSING SOCIETY DELHI CHAPTER

IEEE SPS AIVA 2021

June 24-28, 2021 (Virtual)

Machine Learning and Computer Vision are two fields under the umbrella of Artificial Intelligence that offer effective methods for acquiring, processing, and interpreting images and videos. IEEE SPS AIVA 2021 (Artificial Intelligence for Visual Applications) was a collaborative initiative of IEEE SPS Delhi Chapter along with numerous SPS section chapters across the IEEE India Council Region, in association with SBI Lab(IIITD), and Indraprastha Institute of Information Technology-Delhi, which aimed to illuminate the latest trends in Artificial Intelligence and Computer Vision, Machine Learning algorithms, and Deep Learning for Signal Processing applications in Image/Video Processing.

An unprecedented compendium of webinars, hands-on workshops, networking sessions with SPS Leaders, and industrial seminars, the 5-day extravaganza enabled the youth to access brand-new avenues to build their careers in the Signal Processing realm and eliminate the barriers between college academics and research-based learning skills. It unfolded the revolutionary implications of AI in Computer Vision in an interactive and systematic manner to enlighten young minds.

The event also aimed to recognise researchers working in any of the fields related to AI for Visual Applications through a "Call for Poster Presentations", an excellent opportunity for researchers to receive feedback from field experts. The best poster received an IEEE SPS AIVA best poster gift box and a cash prize of Rs.10,000/-



IEEE SPS AIVA 2021 provided free SPS membership to all the student members of IEEE as well as the first 15 professional members of IEEE who attended. Upon a decision of IEEE SPS DC, this was further extended to all the non-SPS IEEE member volunteers.

Excluding the IEEE India Council Chapter Chairs, the workshop recorded an attendance of 438 people, including 141 IEEE members (114 attendees, 4 speakers, and 23 volunteers) and 297 non-IEEE members (288 attendees and 9 speakers)

EVENT METRICS

Total Registrations
400+

IEEE Members
110+

Non-IEEE Members
290+

CANDID TALK WITH DR. ANUJ GROVER

HEAD OF IIITD CENTRE FOR INNOVATION AND EXCELLENCE

"I am presently working as an Associate Professor in the ECE department at IIIT Delhi. My primary area of research is Digital Circuits and Systems. Before joining IIIT Delhi, I have worked with STMicroelectronics for more than 18 years... I am a creativity and innovation enthusiast and am a Level-3 certified practitioner of TRIZ - a toolset for inventive problem-solving. I also regularly conduct workshops on personal leadership and volunteer for causes that are close to my heart. I enjoy interacting with students and am happy to be of any help."



Given the current situation of COVID, what role do entrepreneurs have to play to uplift society?

India is in dire need of entrepreneurs. In the past one and a half years, the country has lost millions of jobs. Only about half the people who got laid off due to COVID could find other employment. Their new work is often not as skilled as that before the pandemic and therefore of lower quality. In such times, India does not need job seekers - it needs job creators, which is where entrepreneurs come in.

Entrepreneurship creates jobs for people with high-level skills but since the pandemic has hit low-level jobs harder, how can entrepreneurship help with that?

Let us take the example of Mukul Chhabra, the creator of the company Swapeco. Is he creating jobs only for people who are solution finders? He has started a company that, if scaled up, would provide a regular job to many many scrap dealers who would be entirely out of business otherwise.

It is wrong to assume that entrepreneurship only benefits the programmers/ platform-creators or those with other high-level skills. The fruits of entrepreneurship are not limited to the ten jobs created in an office. Entrepreneurs are enablers, and they make a way more significant difference than meets the eye immediately.

Do you have any favourite memories at STMicroelectronics?

Any memories? My bread and butter were designing memories, lol.

I was on the ST campus just recently for a meeting after its reopening. I am still in touch with ST, and we continue to work together, so memories aren't required to talk about it. I have a very fond live relationship with it. ST is a fantastic employer that gives you much freedom to express yourself and grooms you well. It trains you to have strong facilitation skills by investing in you. It has made me realise that I should invest in students. Through this investment, I can contribute to paving the way for students to have a beautiful life outside college. ST has taught me a lot of such things, and these learnings stay with me. Memories? I create those every day. With ST, for me, it's not about one or two memories - it's about the entire life. So there is no one memory that I can point out.

You are the head of IIC and the vice head of IRD. Your thoughts on your experience so far.

The experience till now has been beautiful. The synergy that can be brought about between different bodies, whether ECell or IRD or IIC or the incubation centre, is terrific. There are so many things we can jointly work on. Now that I am in this position, I'm relishing putting forward my ideas, brainstorming and exploring them with others. I'm enjoying myself a lot. I hope that I can make some meaningful contribution to this role and bring about a positive change.

www.twitter.com/agrover22

www.linkedin.com/in/anujgrover/

What is the actual role of IIC in our college? How is it promoting innovation in the institute?

Institute Innovation Council is a body established to facilitate initiatives to promote innovation at IIIT Delhi. Among many things, this includes:

Organise wisdom talks and awareness sessions, in collaboration with e-cell, in which innovators and entrepreneurs share their experiences

Organise pitch-cafes, in collaboration with Incubation centre, in which not only institute but outside innovators and entrepreneurs also pitch their ideas

Organise workshops on innovation and entrepreneurship-related topics like creativity, problem-solving, prototyping, etc.

Establish and maintain a mentorship platform for helping students with ideas to take the next step towards entrepreneurship.

Also, we are coming up with an online platform where start-ups that need small help can post their offers. The idea is that our students get to know what opportunities are available and interact with these start-ups. And when they work with these start-ups, they may be able to develop better ideas that they can pursue independently. Even if you don't want to work with these start-ups, you can work with the ones in our incubation centre. All you need to do is reach out to Mr Alok and state this is my profile, and I want to work with a start-up, and you will see there is always some opportunity that will come your way.

So again, let us not focus on what the government will do. That is something out of our hands. So no expectations on policy changes. Let them do what they do. Our focus should be on widening and strengthening our circle of influence. Seize the opportunities on offer, and you will be amazed by a whole new set of opportunities that will open up for you.

In your position, what do you think is the most important thing that we need to do to inculcate the spirit of innovation amongst the freshers?

The first thing to realise is that innovation is necessary for survival in today's world. If one doesn't innovate and improve, competitive forces will throw one out of a job or business sooner or later.

Interestingly, it is precisely this fear of failure that stops people from innovating, changing, and improving something that may seem to work fine.

Unfortunately, our academic training until Class-XII is such that failures are unacceptable. As we enter into college education, this idea needs to take a U-Turn. While failure in courses is still not a good idea, we need to be open to the concept of accepting failures. We should not hesitate to challenge the status quo and propose alternatives. We should be ready to fail.

In innovation, it is necessary to 'fail fast. We should test our idea on a diverse set of extreme conditions so that bad ideas are thrown out of the window soon enough, and we don't waste time, energy, and resources on such ineffective ideas. Failures take us towards ideas that will work. Since failures are so helpful in the innovation process, they should be celebrated.

Another thing that each one of us should do is be a part of diverse groups. Interacting with people from various sets of ideologies helps one appreciate different points of view, develop empathy and generate ideas that could work in ways that we might not have thought possible independently.

So, be open to new experiences, be open to failures, and be courageous to experiment.

What ideas do you have to help increase the entrepreneurship culture in IIIT-Delhi?

The points mentioned in response to the question above constitute the current plan of IIC. We are open to ideas and suggestions. So, if you want to propose something, please write to any of the core members of the committee or me directly, and we will be happy to explore and work with you on those ideas.

It is up to the inputs from you folks who will decide whether or not I would have left an impact. I am ready to experiment with the ideas I have and ideas you might have. Because without experimentation, there is no definite knowing what will work and what won't.

ANANT SHARMA

Co-Founder and CEO at Tweek Labs



Take us through the journey of Tweek labs?

It started at the end of the 2nd year when I realised that I hadn't done anything special but study. Participation in hackathons helped us in ideation and thinking out of the box. So we thought about a startup. However, we didn't have any idea at all. And one day, I was in the gym, and someone came up to me and asked me, "What are your expectations with the machine you're working out with". At that time, I came up with an answer, but later at home, I realised that what I wanted was feedback, not from the machine but from my body itself. "Is the exercise I'm doing affecting me in the right way"? Or "How can I optimise my performance for any given sport?" This is how we began with the idea. Then we spent two years seeing it through to make it a reality. We did hundreds of iterations working on the various possibilities to make the idea succeed.

How different are the products of Tweek labs from what we get in the local market?

Our system is way more comprehensive than the products in the market which only return a few measures after any physical activity done. Our product is a full-body wearable suit like a compression layer to get a complete matrix about your performance. Now take an example of the tennis app of Tweek labs. It gives you information about the no. of forehands, how many were biomechanically executed amazingly and how many not? More precisely, what are the things you should focus on? The same goes for all sports. All the parameters regarding the user's techniques are analysed and shared with them using our app interface. These products are for the common masses, people like you and me, who want to learn these techniques but can't afford trainers.

Since you won the prestigious Dean's Innovation Awards awardee, would you like to inform us a little about jamoora, the human interpreting robot you developed?

So it all started with music. I was working in one of my labs back then, listening to music as most of us do. So Dr Aman posted a link for a student innovation challenge and wanted us to participate. We used Hindustani classical raags and classified them based on emotions they exhibited. The robot would take inputs from those emotions and perform specific actions. Though it was a weird-looking robot, it worked well. Our project was even selected in the student innovation challenge category for UIST (User Interface in Software Technology, a conference in Berlin. That is how we received the award.

You have actively participated in many co-curricular activities along with academics. How did you manage so many things?

It was pretty easy because I don't let my focus divert away from what I am doing at a given moment. It's kind of making your priorities. When you do multiple things simultaneously, you don't do justice to any of them. A time comes when you start realising that it's about you and not how people look at you. "How you do things" matters more than "what others think about what you are doing".

How difficult was it to be an entrepreneur while your friends were going for placements and higher education?

It was not hard at all. To be honest, you should not opt for entrepreneurship if you think it's going to be hard because that is the thing that's going to stick to you. Being an entrepreneur is about being in for the long run. But that's not why people, including me, do it. We do it because the work we do is very satisfying, and we enjoy what we do. Yes, I had to think twice regarding the path I would choose, but the main thing was that this field fascinated me, and it doesn't matter how it is going, the amount of stuff I'm learning on the way is always going to be relevant to me.

What was your first start up and your motivation behind that?

Audiobytes was my first startup. What motivated me was that I saw that DTU's acapella team was fantastic and I felt we missed this in our college. People call me Anant audiobytes instead of Anant Sharma, and I feel terrific that they think so highly of me. Audiobytes is one of the projects which will always remain close to my heart.

DR. SRI HARSHA GADE

Senior Engineer,
ARM Embedded Technologies



I work broadly on network-on-chip, where we are building efficient interconnection. And during my PhD. I worked on heterogeneous computing. Even my current work is along those lines only but from a different perspective. Basically, my research area is based on Network-on-chip and interconnection architectures.

I joined the same year when the ECE department was established in IIITD, I am from the senior-most batch, so it was a unique experience. Since during that time, various departments like CSE and ECE were new, we had personal contacts with almost every student of each program, and we used to have hours of discussions, and it was an excellent experience. That said, unlike many ug students who were enrolling in the program having mere expertise in the field, we masters and PhD students used to have hours of discussions with our professors regarding anything and everything, whether it's setting up the labs, regarding some undergraduate courses and whatnot. And we had such an excellent faculty that helped us in technical and study-related issues and in life and personal problems. We were given the freedom to work on a project of our choice, which is how I stumbled on this network-on-chip area. Through the TAship I did during my master's and PhD, I learned a lot of new things.
Even if we end up learning just a little at the end of the day, that'd be enough, and I'd be delighted if that little step of us could bring the depth up and build a better and brighter future for the people who wish to opt for ECE.

Looking back at the decision to join IIITD at the time you did, do you regret your decision?
Surprisingly no. A big NO. I mean it is natural and there's always a chance that when you're joining a new college or university, things might not go as well as you would have expected but it was not at all the case. I even find myself lucky that I joined IIITD. It was a lucky chance as I applied for IIITD as a second option if things wouldn't go well with the university I was actually planning to enrol in. And somehow it happened and I joined IIITD by luck and it turned out to be great. Everything I did here was a whole new experience for me and hence I never looked back.

What were the difficulties you faced at that time of joining IIITD?
Since we were doing various design courses, we needed different equipment and technology libraries to synthesise everything, so the biggest challenge was getting those things on time. Getting such tools for the labs was not an easy task. We had to inform our professors, and they talked with the related company, so it was a logistic process. It happened a few times that we had to postpone our projects a little bit. And for me, that was the biggest challenge, getting the resources and getting them at the right time.

Compared to the college where you completed your undergrad, life at IIITD would have been much more happening. How was it to be a student at IIITD?
Yes. It was a great experience being at IIITD. I mean, I was there at the campus for almost seven years, and during those seven years, something was always happening, like getting to know new things, giving inputs to someone or another, and learning a lot. I knew all my professors, and even today, I stay connected with some of them. It was like every day; there was something beyond the learning part. It is a bit difficult to explain those feelings. One has to be there at that moment, going through all of that to understand it better.

KHALID LODHI

ASIC Development Engineer, SanDisk

You have been a part of so many clubs and posts. Which one has the most memorable moments?

I got to meet so many lovely people in college. I was a part of lots of clubs. It was so much fun to be a part of them. I was a day scholar, and whenever there was some pending work, I used to stay with one of my friends in college. I was famous for sleeping in labs.

Being a student mentor was a wonderful experience. I got to know so many lovely juniors, and with their help, I was able to connect to so many more youngsters. Other than that, being a member of the student council was a fantastic experience. I got to work with my batchmates and students from different years and helped a lot of students. Both these experiences helped me grow as a person too.

After being in an offline college for so long, how do you feel completing it online?

I will cry after this question. I wanted my convocation to be offline, but I suppose it will be held online due to this pandemic. Convocation is something that every college student looks forward to, and the pandemic is ruining it. Convocation captures all the memories of your four-year college experience, and I wanted it offline.

As you have worked with lots of faculty, what do you suggest to build that kind of a relationship?

You need to start making conversations. Their doors are always open for students. If you have any doubts, you can reach out to them. If you have questions related to your course or your future, they will always help you.



I did my B.Tech. honours in Electronics and Communication Engineering from IIITD. Apart from that, IIITD gave me lots of opportunities. When I was in my first year, I started working with my professors. I learnt to salsa. Apart from having a job in SanDisk, I am also involved in freelancing work.

Being a part of so many things, how did you manage your time given the rigorous academic schedule of IIITD?

It is all about prioritising your work. If you have academics and council work, you can prioritise the council work for some time and then give the rest of your time to academics. If you prioritise your work, it will also help you to learn new skills. You would have time to play sports, increase your social circle, and enjoy college life. I feel like when I was working in all these domains, my academics improved.

If you want to handle academics, you should do group studies to clear many of your doubts.

You are one of the few students who went for the ECE core instead of opting for IT sector jobs. What are your thoughts on that? How should students prepare for hardware profile jobs?

I believe ECE students are not aware of the opportunities available in the hardware industry. This lack of knowledge hinders their decision-making process. You have to choose your courses wisely and plan accordingly. For example, even if you love coding, you can still do coding in system design engineering. Now I know that fewer core companies come for placements, and they too prefer students enrolled in M.Tech or P.hd. But If you give them tough competition and do your coursework sincerely, you can get an excellent job in the ECE sector. Even if the companies are not coming, you can always apply off-campus. In the end, what matters is your efforts and interests.

I am currently working as ASIC Development Engineer at Sandisk. My main intention was to go into the VLSI field. In the interview, they ask the basics of VLSI. Later on, an aptitude test is conducted on the basics of electronics. One should master the introductory courses and then carefully pick the courses concerning the field they want to pursue.

How was your experience being a teaching assistant? Any advice for our juniors?

I had already planned to do TAship for M.Tech students and not for B.Tech ones. So I did TAship for the M.Tech students. You have to stand apart from others if you want to be noticed, and a B.Tech student teaching M.Tech students is relatively uncommon. You have to do something different or do the same thing differently.

The advice I would give to aspiring students who wish to be TA in the future is to have a good grade in your subject and be in regular contact with your professor.

DR. DEEPAYAN BANERJEE

PhD, Design and Application of Multi-Band Planar RF Devices and RF Power Amplifiers

What was your motivation to pursue a Masters in ECE? How do you propose students choose what path to follow?

I would always say what I did. In my life, I didn't know what I would do next, but I surely knew what I wouldn't do next. One thing was obvious that I didn't wish to go to the IT sector. I thought that if I go into the I.T sector, what is the purpose of doing my engineering in the electronics section. I did my internship at All India radio. I knew that I could do research work in microwaves. Now to do my masters, I had to do GATE. There were some troubles too. There were some courses in IIITD, but you won't get a specific degree for studying microwaves. So I had to get a generalized electronics and communications master's degree. After that, I went for a PhD at IIITD, and fortunately, we could do a PhD in microwaves here at IIITD.

So first things first, you should decide what you wish to do. Once your goal is clear, it becomes pretty simple. Doing GATE is sort of getting a brand name. In India, many people opt for engineering, but very few know what engineering is about. So start early. Start watching youtube videos. Look for resources, and you'll be fine.

You have been a TA for both Mtech and PhD courses. How has your experience been? Do you have any advice for the students who wish to take TAship in the future?

It is compulsory for PG students to be TA in IIITD. The initial stages of the job can be frustrating given we have to teach unfamiliar subjects sometimes. But these experiences trained me to work in unfamiliar and tense conditions. During my PhD, I taught core subjects which helped me to clarify my concepts as well. So, being a T.A. taught me a lot of things. To the students who wish to become T.A.s themselves, I would say that honesty is important not only with the students and faculty but with yourself. This is the key secret behind every successful T.A. or faculty. What you teach, you must study as well, as it is impossible to know everything. If you make a mistake while teaching, own it and learn to correct it.



PM Narendra Modi had a vision of creating 100 smart cities across India, and to be a part of that mission, you proposed, "Garbage disposal system for SMART cities." Would you like to brief us about your proposal?

It fetched me the national first prize from International GreyOrange Accelerated Learning in 2016. I proposed a garbage disposal system, basically a smart dustbin. Every city in India has a garbage system, be it the placement of dustbins at every corner of the city, or the sewer lines. Now the problem in this system is that the dustbins usually overflow with garbage and it becomes unhealthy and unsanitary for the people. Now in my plan, there would be automated dustbins whose garbage content could be monitored and shown on the google map. It would maintain the quantity and the quality of the garbage. Once the bin gets filled up to 80%, a notification will be sent and the garbage trucks will empty the garbage from those bins.

We kept a couple of bins in Gurgaon and they were powered by solar panels. We hired IBM cloud for data collection. It worked pretty well and we demonstrated it in grey orange Pvt. Ltd. in Gurgaon and they funded us. We demonstrated it and got the national first prize. We also received several gifts. The entire project was fantastic.

Apart from the labs and things like that, how did IIITD help you in your research?

In terms of software, IIITD has the best labs and resources available for research work, but it lags when it comes to hardware. There are certain hardware devices required for microwave research that are not available here. In ECE labs concerning the digital domain, VLSI, analog VLSI are amazing.

I had to travel a lot to different universities to get resources concerning my research.

Apart from that, IIITD helped me with good recommendations. My professor nominated me for DORF. What's good about IIITD is that it showcases your research work and papers on a very large scale. IIITD takes pride in your achievements and is good at advertising your achievements. IIITD provides a lot of funds when you have to travel for research work.

Dr. Deepyan's journey with us began in 2015. Having finished his bachelor's degree, he enrolled at IIITD for a master's. He completed the same, working with a professor in the Digital Circuits department. Being uninterested in placements and motivated to work in the research domain, he applied for a Ph.D. in January 2017, for which his professor affirmed him by the end of February. He rolled from a master's to a Ph.D. program in March and continued studying at IIITD for a while. He had a minor breakthrough in April and a comprehensive exam in December, after which he got the opportunity to sign up for a visiting research program at the University of Calgary in Canada. In June 2019, having worked nearly two years with a fantastic team, he returned to India and took a quarter-year break. In the following months, he continued his research at Calgary and diversified his field of study. Around August 2020, he completed his research thesis and defended it later in December.

STUDENT ACHIEVEMENTS
MARCH 2021 TO AUG 2021

"We can do it because we want to do it
We will shine no matter where we go
Because there is no limit for us
Because in the darkness we will glow"

We are feeling proud to share with our readers the success stories of our shining stars who never miss a chance to prove their excellence not just in the field of technology but wherever their interest takes them.



JAYANT JAIN & SHUBHANKAR POUNDRIK
B.Tech. 2017

Co-authored a paper titled, "Interpretable AI Model Based Predictions of ECG Changes in Covid Recovered Patients' To determine the effects of Covid-19 on ECG of post covid patients' ' which got published in Indicon Conference 21. They then co-authored journal titled "Heart Rate Variability (HRV) as a marker of cardiovascular dysautonomia in post- COVID-19 syndrome using Machine learning algorithms" which was submitted to the prestigious journal "Heart Rhythm'' Journal



TEAM IGNITED MINDZ
B.Tech.

Team Ignited Mindz consisting of 6 members, Arham Ali, Arjun Raj, Pooja Kumari, Raghul P.K, Shreya Tomar, and VijayKrishna won 1st position in the Smart India Hackathon - Hardware edition 2020 for their project "E - Vision" under the "Student Innovation" category



RAHUL MADAAN
B.Tech. 2017

Rahul's regular paper titled " Effects of Polite Triggers in Chatbot Conversations on User Experience across Gender, Age, and Personality" was accepted in the 30th IEEE International Conference on Robot and Human Interactive Communication 2021 which was held between 8-12 August 2021



BUSHRA ANSARI
PhD

Bushra was selected to present her research on "High-resolution satellite-based land surface monitoring using NavIC L5 signal" at the UN/Austria Symposium, "Space Applications for Food Systems" organised by the United Nations Office of Outer Space Affairs. With potential to change our view on satellite-based land surface monitoring, the research has been supported by DST-SERB Early Career Research Award.



SACHIN MOTWANI
PhD

Sachin's article, 'Experiencing Hyperloops: The Transit of the Future,' co-authored by Prof. Anubha Gupta of SBILab, IIIT-D, got featured in the July edition and was trending (Top 2) at IEEE Computer Society's flagship IEEE Computer magazine.
His next article, 'Ethics in Autonomous Vehicle Software: The Dilemmas,' co-authored by Prof. Anubha Gupta of SBILab, IIIT-D, is trending at the first position as on August 9, 2021 at IEEE Computer Society's flagship IEEE Computer magazine.



ISHAN MALHOTRA
B.Tech. 2020

Got selected as a Delegate for Harvard College Project for Asian and International Relations (HPAIR) 2021. HPAIR is an internationally recognized student organization at Harvard College. The conference was held between 20-23 August 2021 with students competing all over the world



ANIKET GUPTA
B.Tech. 2020

Won the Popular Choice Awards at Josh Education Awards 2021 Presented by Dainik Jagran (Students Category) in the presence of the honorable Education Minister of India, Dr. Ramesh Pokhriyal Nishank and Founder of Super 30, Mr. Anand Kumar for his initiative The Tale of Humankind.
Also got selected amongst the cohort of top 19 Indians this year to join the global Network of Ashoka Young Changemaker (2021) who have launched their own initiative and created positive change in their communities.

CYBORG
The Robotics Club

Cyborg is the Robotics Club of the Institute. Our work consists of creating both hardware as well as software solutions. We are focused on developing algorithms which derive new possibilities with a limited set of hardware in an adverse environment. We organise sessions on topics like Machine learning, Deep Learning, Control Theory to help students enhance their knowledge by introducing them to new and exciting fields in the industry. We help them build their skill sets by providing hands-on experience while working on our projects.

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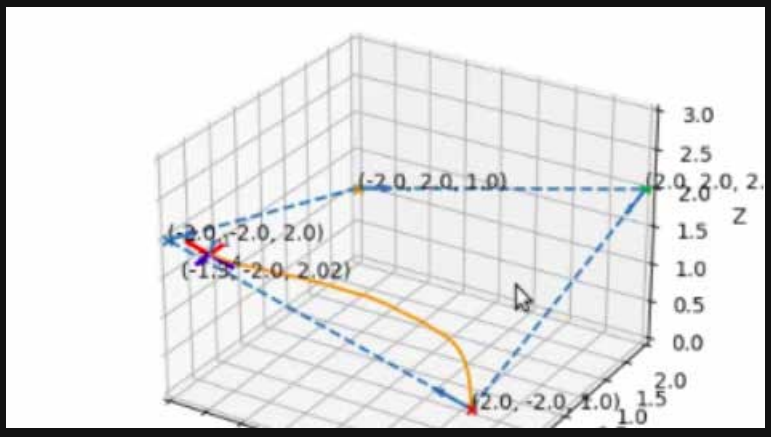
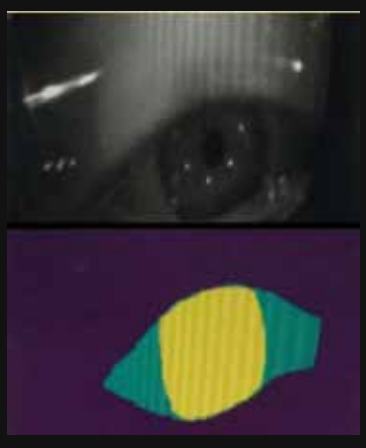
DRONE SIMULATOR



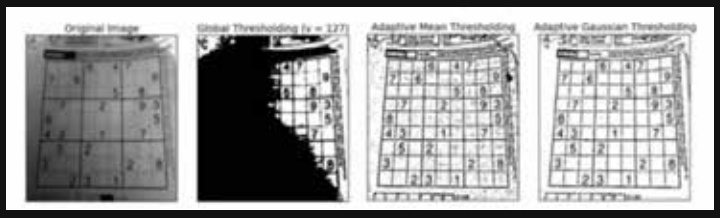
This project aimed to create a drone simulator from scratch to teach students about the PID controller and also to create a simple to use testbed to test some popular control algorithms without going into many lines of code. This simulator utilized a multi-loop PID controller to control the drone between the waypoints specified by a file and hence moving the drone on a path which is marked.



EYE SEGMENTATION

The aim of this project was to create a deep learning model which could accurately segment images of the human eye into its constituent parts such as the iris, pupil, sclera and so on. The Facebook OpenEDS dataset was used to train the model.

INTRODUCTION TO COMPUTER VISION WITH OPENCV



Session introducing students to the concept of Image processing and how it is useful in computer vision.
Introduced students on how to use basic functions in openCV along with descriptions of different concepts like thresholding, edge detection, corner detection using classical techniques.
Touched upon the concept of filters and how useful they are in classical computer vision and image processing.

PROJECTS IN PROGRESS

Airsim environment for drones
Object detection and tracking
Optical Flow
Steering Prediction
Depth Prediction

IEEE
IIIT Delhi
Student Branch

IEEE IIITD
Student Chapter

IEEE is a global association and organization that develops, implements, and maintains technology-centred products and services. IEEE IIIT Delhi Student Branch seeks to harness the talent of young engineers who have an indomitable zeal to design, create and innovate. The IEEE Women in Engineering Subchapter is dedicated to promoting diversity in technology and inspiring girls worldwide to follow their academic interests to a career in engineering. The IEEE Computer Society seeks to advance the theory, practice, and application of computer science and technology as well as the professional standing of its members.

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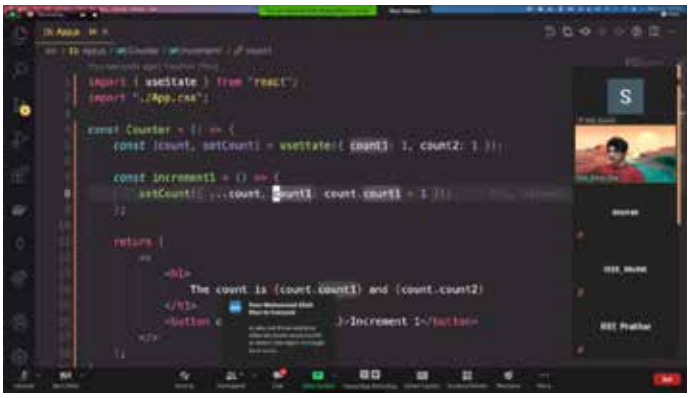
WEB DEVELOPMENT WORKSHOP-CUM-COMPETITION USING REACT



IEEE IIIT-Delhi CompSoc organised a two day workshop dedicated to web development using React. The aim of the workshop was to familiarize the students with React- one of the most famous front-end JavaScript frameworks.

SLASH - CRYPTIC HUNT

IEEE IIIT-Delhi organized its signature annual cryptic hunt- Slash on June 28, 2021. The event saw a participation of 100+ people across ten cities and about 15000 attempts. The cash prizes were worth ₹4500.

BACHMANITY INSANITY



Bachmanity Insanity is IEEE IIITD's annual Tech Quiz which was organised on June 2, 2021. Participants competed in an exciting battle of wits.

IEEE WIEXENACTUS IIITD FOR PRIDE MONTH



IEEE IIITD WiE Subchapter collaborated with Enactus IIITD for a month-long Instagram campaign celebrating Pride Month 2020. The campaign focused on providing a platform for students at IIIT Delhi identifying as a part of the LGBTQIA+ community to share their experiences. We also concentrated on topics such as the challenges faced by the community, media representation, diversity hiring in companies etc.

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