स्पंदन SPANDAN

Newsletter of Department of Electronics Engineering
J. C. Bose University of Science and Technology, YMCA, Faridabad

Oct-Dec 2022

From Chairperson's Desk

Dr. Pradeep Dimri
Chairperson and Professor,
Department of Electronics Engineering

Dear Electronics Family of J.C.Bose University of Science and Technology, YMCA, Faridabad.

Warm Greetings! "Celebrate endings, for they precede new beginnings." With the same motto, it is my heartfelt pleasure to present to you all the current edition of SPANDAN, the newsletter of the Electronics Department.

A famous saying goes like this: "Coming together is beginning, keeping together is progress, and working together is SUCCESS. "With this philosophy in mind, we, the Electronics Family, continue growing and learning in numerous fields. This small newsletter may not do justice to everything happening in our Department. Still, it gives a small glimpse of what is happening in the Department. Please feel free to send your valuable feedback to our zealous editorial team.

Best wishes and Regards.

Mission

- To frame a well-balanced curriculum with an emphasis on basic theoretical knowledge as well as the requirements of the industry.
- To motivate students to develop innovative solutions to the existing problems for the betterment of society.
- Collaboration with the industry, research establishments, and other academic institutions to bolster the research and development activities.

Vision

To be a Centre of Excellence for producing high-quality engineers and scientists capable of providing sustainable solutions to complex problems and promoting cost-effective indigenous technology in the area of Electronics, Communication & Control Engineering for Industry, Research Organizations, Academia, and all sections of society.

News & Events:

ACTIVITY REPORTS:

Department of Electronics Engineering of J.C.Bose University of Science and Technology, YMCA, highlights its informative and innovative training programs/ expert lectures for 2022. The department aims to stimulate knowledge sharing by conducting the following activities.

LECTURE SERIES:

Lecture: Multirate signal processing

In the Department Seminar series, the expert lecture was delivered by Dr. Dushyant Shukla in coordination with Dr. Nitin Sachdeva and Ms. Sangeeta Dhall on the topic "Multirate Signal Processing." on 2nd December 2022. In his talk, Dr. Dushyant Shukla accentuated the concepts of Multirate Signal processing, which includes more than a single sampling rate to perform operations. It includes Upsampling & Downsampling, Rate changing, Nyquist rate, Filters, and Efficient implementation.

INDUSTRY READINESS PROGRAM

The Department of Electronics Engineering, J.C.Bose University of Science and Technology(YMCA) Faridabad organised a Value Added Course- INDUSTRY READINESS PROGRAM.

The inaugural ceremony was held in University Auditorium, and all the dignitaries of the university were cordially invited to grace the occasion with their benign presence. Prof. S.K. Tomar, Vice-chancellor, and Prof. Pradeep Dimri, Chairperson of the Department of Electronics Engineering, Welcomed the guest and briefed the workshop. Industry readiness program held from 18th Nov. - 15th Dec. The speakers of this event were Sh. K. Kishor Narang , Sh. Y.P. Singh, Mr. Hitesh Pratap.

This program provides the skills necessary to become employed and stay productive in the current industries. This unique program is designed for students keen to pursue a career in Electronics and computer industries. It is carefully crafted by analyzing the skill gap in the industry and soliciting inputs from industry stalwarts. The program combines theoretical and practical approaches for professional development and a holistic learning experience.

INNOVATIONS

CRAZE-O-REIZO:

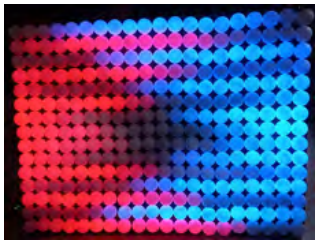
Micorbird -The Techno Club performed the most exciting event at the Reizo'22, Craze-O-Reizo. It was an LED dance show entirely controlled by the music beats. The audience went crazy during the performance, and the event received a very overwhelming response from the students as well as faculties of the University.

Smart Traffic Management System:

This project was developed by the students of Department of Electronics Engg. under the headship of IEEE Club.

An intelligent traffic management system project is a technology-based solution that aims to reduce congestion and enhance road safety. The proposed system improves the overall traffic flow and reduces carbon emissions, fuel consumption, and travel time. The prototype employed four ultrasonic sensors, Arduino Mega, and RFID reader tags. Ultrasonic sensors detect the density of cars and control the traffic lights accordingly. RFID tags are used to track and monitor the movement of emergency vehicles on the road. This project aims to manage traffic and traffic lights based on real-time traffic. It takes intelligent decisions to minimize the waiting time for each lane and thus provide a faster and safer travel experience. This project will revolutionize managing urban traffic and provide a more sustainable and efficient transportation network.

Led wall

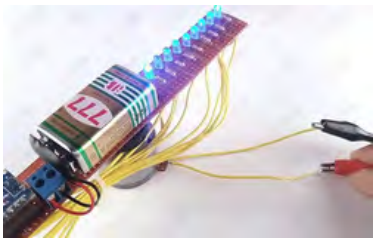


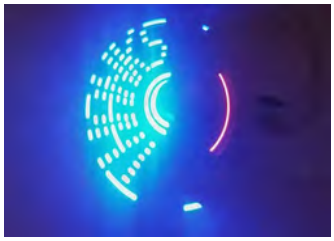
The LED wall is an array of 300 LEDs arranged in a 20x15 manner on a board, each LED is covered by a ping pong ball, and each ball acts as one pixel. This project uses a WS2811 neopixel LED strip, which can be individually addressed using a microcontroller. It is an RGB LED strip capable of producing over 16 million colors. Different patterns can be displayed on this wall using Arduino Uno.

In this product, an ESPCam is employed, using which image detection and processing is done. Hence, a person standing in front of the wall gets detected by the camera, and a real-time image is displayed.

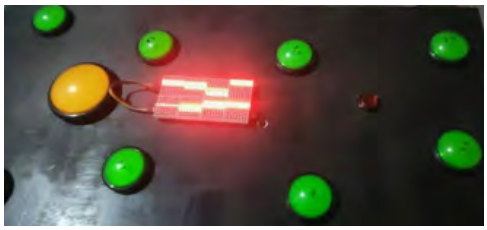
POV Display

TThis project is based on the persistence of vision; that is, after the visual perception of an object stops entering the eye, it becomes an optical illusion that occurs when the visual perception does not stop for a certain period. This is done by lighting the LED in a particular pattern. In this project, a led strip can be controlled using a microcontroller individually. Arduino Nano is the brain of this project which turns on and off lead after a fixed interval of time, and the whole system is rotated using a motor to display any name.



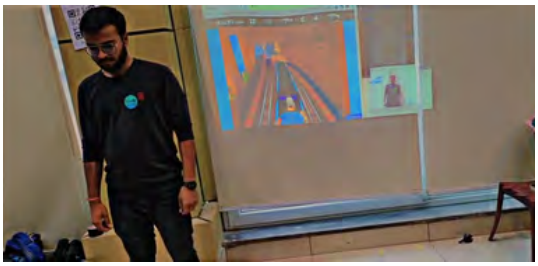


Wack-a-mole



This project was developed by the students of the Electronics Department under the headship of the IEEE Club. Whack-a-Mole is a classic arcade game that involves hitting plastic moles with a mallet as they pop up randomly from different holes. This project involves designing and implementing a digital version of the game using software and hardware components. The project aims to create a fun and engaging game that can be played on a handheld device. The software component of the project involves programming the game mechanics, graphics, and sound effects. The game is designed to respond to player input and keep track of their progress. The hardware component of the project involves building a physical setup that simulates the gameplay of the original arcade game. This consists in creating a box with holes for the moles to pop up from, designing and building a mallet for the player to use, and integrating buzzers to detect and respond to player input. Overall, the Whack-a-Mole project involves a combination of software and hardware engineering skills, creativity, and game design knowledge.

SUBWAY-SURFERS:



Microbird-The Techno Club created a real-life OpenCV project in which the ICONIC Subway Surfers game can be played from body gestures. In the game, the player plays the role of a graffiti artist caught tagging a subway train. The player must then run along subway tracks, avoiding obstacles such as trains and other hazards while collecting coins and power-ups.

LED Cube

This project uses an 8x8 WS2812B LED matrix. The brain of this project is ESP32. The INMP441 sensor is employed for audio sensing, which is a digital output sensor. The microphone used in this is a MEMS device. It is a high-performance, low-power, omnidirectional mic. The color of the whole matrix can be controlled by using the app. It can display various animations that look mesmerizing, and it has sound-reactive features also. The brightness and pattern change according to the beat of the music.

HOW TO STOP OVERTHINKING

By : Aarusha (ECE, 2nd yr)

Overthinking is simply the act of thinking about something too much or for too long. It is exhausting and energy-draining. It elevates your stress levels, reduces your creativity, clouds your judgment, and strips you of your decision-making power. Fortunately, there are a few ways to handle overthinking. All of them require conscious work from your side. They are:

- Positive reframing: Positive reframing allows you to acknowledge the negative aspects, then asks you to evaluate whether there's another way to think about the situation.
- Stop your thoughts on the future and past and focus on being in the present moment. Bring your attention to where you are here and now. Daily rituals like journaling and meditation help you retain control over your mind, reduce stress, improve focus, and increase self-awareness.
- Identify your fears: "We suffer more often in imagination than in reality." The fear of what others might think, making mistakes, or not being good enough to succeed often tangles us into indecision. Take a small step toward your fear, and the moment you take action is the moment you win a battle with your overthinking.
- Focus on what you can control: When you find yourself worrying, take a minute to examine the things you have control over. This magnifies and enhances our power and control.
- Acknowledge your successes: When overthinking, stop and take a moment to jot down five things that have gone right over the past week and your role in them. These can be small wins or tremendous accomplishments.
- Manage Your Stress: Move, Unplug, Spend Time in Nature.

- Whenever you feel overwhelmed with thoughts, try these
  1. A walk in nature.
  2. Exercise.
  3. Digital detoxification.
- Silence and solitude are most often the keys.
- Write down Solutions: When you feel overwhelmed, take some time to write down all the thoughts creating problems in your head and then brainstorm solutions. If you arrive at least one answer, you've taken the time to think and swim through your thoughts.

Everyone overthinks occasionally. But if you feel it's getting out of hand, don't hesitate to contact a mental health professional. A good therapist can guide you through a dark time and teach you to reframe your thought..

A Brief Insight into PhD Research Area

Graduate research programs in our university are an essential driver of research output—the Ph.D. Scholars of the University are engaged in various forms of research activity in different domains. Few of them are receiving scholarships through Government schemes too. Here is an insight into the current research projects of our industrious students:

Name: Pratibha Rani **Supervisor:** Prof. Pradeep Kumar Dimri
Topic: Design and analysis of massive MIMO communication system
Work: Today's 4G base stations have a dozen ports for antennas that handle all cellular traffic: eight for transmitters and four for receivers. But 5G base stations can support about a hundred ports, which means many more antennas can fit on a single array. That capability means a base station could send and receive signals from many more users at once, increasing the capacity of mobile networks by 22 or greater. This technology is called massive MIMO. It all starts with MIMO, which stands for multiple-input multiple-output. MIMO describes wireless systems that use two or more transmitters and receivers to send and receive more data simultaneously. Massive MIMO takes this concept to a new level by featuring dozens of antennas on a single array. MIMO is already found on some 4G base stations. But so far, massive MIMO has only been tested in labs and a few field trials. In early tests, it has set new records for spectrum efficiency, measuring how many bits of data can be transmitted to a certain number of users per second. Massive MIMO looks very promising for the future of 5G. However, installing more antennas to handle cellular traffic also causes more interference if those signals cross. That's why 5G stations must incorporate beamforming.

Name: Sandeep **Supervisor:** Dr. Sheilza Jain

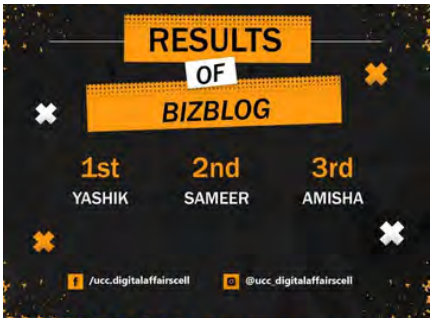
Topic: Design and analysis of an effective controller for deregulated power system.
Work: This is the transition period for the power industry to switch to a deregulated environment from the existing one. These structural changes have posed many operational and control difficulties for power engineers. The prime objective is to adjust the active power generation in response to variable power demand so that scheduled system frequency and scheduled tie-line power flows with neighboring control areas at desired tolerance values, for this a robust controller is needed at generating unit, which can generate an appropriate control signal when there is a mismatch between generated power and load demand; this process is known as automatic generation control (AGC). For AGC purposes, classical and innovative cascade controllers are utilized, and metaheuristic-based optimization techniques have been used to tune the controller gain to an optimum value. Energy Storage (ES) elements and Hybrid Energy Storage (HES) have been incorporated with the controller to achieve the AGC objective.

Research publications:

- **Amir Mansoori, Shamim Ahmad, Sonia, Munish Vashishath** " Flexible Graphite-Based Humidity Sensor Using Green Technology," ECS Sensors Plus, Volume 1, 2022.
- **Rahul Gupta, Anil Kumar, Vishal Rohilla, Pradeep Kumar, Mukesh Kumar, Dinesh Kumar, "**Noise Spectroscopy Based Numerical Modelling of Chemisorption on SnO2 Surface for CO Gas Sensing Applications," Micro and Nanostructures, Volume 171, 2022.
- **Rishi Singhal, Shailender Gupta and Poonam Singhal,** "An Ensembling Approach using DL & Non-DL Techniques for Detecting Brain Tumors using MRI Scans," 2022 IEEE International Power and Renewable Energy Conference (IPRECON), Kollam, India, 2022, pp. 1-6.

- **Kalyanee Devi and Rohit Tripathi,** "Applying an Optimal Seed Selection Scheme Under a Progressive Model," 2022 13th International Conference on Computing Communication and Networking Technologies (ICCCNT), Kharagpur, India, 2022, pp. 1-6.
- **Kuldeep Choudhary, Sunil Jadav, Shubham Tayal, Preet Kaur, Lalit Rai, Rajneesh Sharma,** "Power Efficient Multiplier using Vedic Algorithm and Self Bias Transistor Technique," International Journal of Electronics, 1-15, Taylor & Francis, 2022. Prashant Kumar, Lalit Rai, Neeraj Gupta and Rashmi Gupta, "Diminished Short Channel Effects (SCEs) in Junction Less Double Gate (JL DG) MOSFET," 2022 IEEE International Conference of Electron Devices Society Kolkata Chapter (EDKCON), Kolkata, India, 2022, pp. 231-234.
- **Lalit Rai, Prashant Kumar, Neeraj Gupta and Rashmi Gupta,** "Performance Analysis of Adiabatic CMOS Interface for Low Power Applications," 2022 IEEE International Conference of Electron Devices Society Kolkata Chapter (EDKCON), Kolkata, India, 2022, pp. 226-230.
- **Sandeep Rangi, Sheilza Jain, Yogendra Arya**, "Utilization of Energy Storage Devices with Optimal Controller for Multi-Area Hydro-Hydro Power System Under Deregulated Environment," Sustainable Energy Technologies and Assessments, Volume 52, 2022.
- **Om Dev Singh, Sangeeta Dhall, Anjali Malik, Shailender Gupta**, "A Robust and Secure Immensely Random GAN Based Image Encryption Mechanism," Multimedia Tools and Applications, 2022.

CRIMSON ACHIEVEMENTS



Yashik Taneja, a student of ENC, 2nd year, along with his team(IEEE YMCA SB), participated in a technical competition named Bizblog(Digital Fiesta 21) organized by UCC & DA(J.C Bose UST, YMCA). They secured 1st position and got goodies. Congratulations to them!

Gaurav Pathak, a student of B.Tech EIC, 4th year has actively volunteered at various IEEE events and conferences including IEEE Returning Mothers Conference 2022 and 2023 serving as the Secretary, being a Graphics Lead at IEEE PES Day 2023 and an core committee member at IEEE Quarter Tech Talk Table.

Gaurav Pathak (EIC,4th year) brought laurels to our institution for being an IEEE PES Day 2022 Ambassador and was awarded 200 dollars for getting 2nd position as the best IEEE PES Day 2022 Ambassador. Kudos to him

Aditya, a student of ECE, 2nd year, got the position of "TEACHER" at a business competition held at KL Mehta Dayanand School. Keep doing good deeds, and let your University and parents feel proud.

Pulkit Mangla, a student of ENC, 2nd year, along with his team (Pi-Braille), participated in a technical competition Speed 2022 hosted at GD Goenka University, Gurugram, and got ranked 1 along with a cash prize of 2500INR.

Tanishq Verma, a student in EE(IOT), 1st year, along with his team (NCC), participated in Republic Day and the convocation parade. Congratulations.

Genetically Modified Food

Hunger is a significant issue that affects millions of people across the globe. It is estimated that over 800 million people suffer from malnutrition, with many of these individuals living in developing countries. Traditional approaches to addressing this issue have included increasing food production through improved agricultural practices and increasing food aid. However, one promising solution that has gained attention in recent years is GENETICALLY MODIFIED FOOD or GM FOOD.

GM food is created by introducing new genes into the DNA of plants or animals. This process can improve the nutritional content of crops, make them more resistant to pests and disease, and increase their yield. Several techniques can achieve these modifications, including gene editing and transgenic modification.

For instance, a genetically modified crop called "Golden Rice" was developed to address vitamin A deficiency, which affects millions of people in developing countries. Golden Rice contains beta-carotene, a precursor to vitamin A. Incorporating this nutrient into the rice is hoped to solve the significant problem of Vitamin A deficiency. Another example of a genetically modified crop is "BT cotton." This crop is engineered to produce a toxic toxin to cotton bollworms, making it more resistant to the pest and resulting in increased yields and reduced pesticide use.

Critics of genetically modified food argue that it poses potential risks to human health and the environment. However, extensive research has been conducted to assess the safety of GM food. In the case of Golden Rice, it is safe for human consumption, and the World Health Organization has recommended its use. Similarly, studies have found that BT cotton has not harmed the environment. Instead, its use has reduced pesticide consumption.

Despite the potential benefits of genetically modified food, there are still multiple challenges to its widespread adoption. The first challenge is the regulatory environment, which can vary significantly across countries. In some regions, there needs to be more clarity around the safety and efficacy of GM food, which can hinder its adoption. Additionally, there needs to be more public awareness and education about the benefits of GM food.

In conclusion, genetically modified food can be a valuable tool in addressing world hunger. By increasing the yield and nutritional content of crops, GM food can help to improve the diets of millions of people around the globe. While there are challenges to its adoption, continued research and education can help to overcome these barriers and realize the potential of genetically modified food

WELCOME

Coming and going is part of a life journey. This trend is seen in our department also; Ms. Manju Dager, Ms. Preeti Mehta, Ms. Amana Yadav and Ms. Renu Goyal joined as Assistant Professors (Guest Faculty) this year in the Department of Electronics Engineering. Welcome, and wish them happy work and growth in future endeavors!

Guidance For Placements

Placements are one of the essential criteria for any student while selecting an institute for admission. In this respect, YMCAians are lucky enough to have excellent placement records. Additionally, the placed students guide their juniors also for better future prospects. **Vicky from EIC (2018-2022)** got a 175 All India Rank in GATE-2022 and got selected as a grade A officer in Indian oil corporation limited(IOCL). Through rigorous preparation and continuous learning, he cracked the highly competitive GATE exam showcasing his comprehensive knowledge, problem solving abilities and strong analytical skills. His success stories serve as an inspiration for upcoming subordinates. Here are some insights from him of his journey.

- **Start early :** Take your time and decide what you want whenever you start thinking of jobs.
- **Proper guidance :** After deciding, get in contact with some seniors who achieved some in the same field, they will make your path easier and not let you divert from the goal.
- **Study material :** Find some well established and reputed coaching institutes, don't go for hyped new institutions.
- **Exam format :** Be well aware of the exam format, number of questions, time limit etc.

Snehal Malhotra from ENC (2019-2023) through her dedication and continuous learning, shows her talent, hard work, and commitment, which leads to extraordinary success, and gets a fantastic package at a renowned company like ADOBE, which is 47LPA. Here are some of the valuable tips from her.

- **Explore all the domains:** explore the fields at the start if you are starting early, find the parts you are interested in, and start working on them. After that, you should start researching the company's requirements.
- **Improve Your Communication Skills:** Practice communication skills as it is an essential aspect of any job. Attend mock interviews, participate in group discussions, and practice speaking fluently and articulately.
- **Focus on Technical Skills:** Focus and brush up on your core subjects, especially those related to your branch or specialization. Keep yourself updated with the latest technologies and innovations in your field.
- **Prepare Your Resume:** Prepare a well-structured resume highlighting your skills, achievements, and relevant experience.

Alumni Relations

Ram Kishor Sachan

President of M/s Shreeyam Power and Steel ltd.
M/s Preet Machines Ltd in 2014 as President
Tata Steel Jamshedpur in 1982
1978-1982 (Electronics & Controls)

Q. What according to you is the most important skill one needs to perform well professionally?

Skill is important to realise what you plan, even if you possess theoretical concepts and knowledge which is essential but lack in proper skills then will face difficult situations to solve to realise plans on Ground. In my opinion the most important skills are to understand the problem and another is to communicate your seniors and juniors in correct way to transmit correctly what you want to inform them. Practicing the common-sense is another important skill.

Q. What is the roadmap you followed to reach where you are today?

Really speaking no roadmaps planned, just doing the allotted work during initial phase of carrier, performing the duties very honestly and with full efforts, it was the requirement of the circumstances fulfilled with positive attitude, the result is all by the grace of almighty. After initial phase you need to learn to plan your work without waiting for directors of company but with proactive approach learn to discuss your plans of execution with directors and owners of organisation. Proactive approach gives you an edge over others. Being from humble background of a village but knew the importance of discipline, honesty and integrity I Moved with the flow of Time and made smaller diversions in the same direction and lived a satisfied life to reach present level.

Q. What are the obstacles you faced on your journey and how did you overcome them ?What did you learn from them?

No good comes automatically, You have to perform duty (Kartabya as per Srimad Bhagwat Gita) while starting some project in life you face challenges mostly during beginning and during course of implementation, you have to be cautious and must have idea of expected hurdles from technical economical fronts and most importantly from colleagues, skill of taking cooperation and treating non-cooperation and identifying them while forming a team. For an engineer it is many of the time required to do a work which doesn't belong to your discipline or not of technical in nature, to pass such hurdles one has to study other sides also. The obstacles are temporary and can be defeated by stable long term efforts, don't leave the constructive fight. I learn from obstacles, no obstacle is permanent, if it is human being don't make an enemy out of it.

Q. If you were to give one advice to the students of YMCA what would it be?

My advice will be there is no shortcut to success, it is work with integrity, positive attitude, always update yourself with theoretical concepts behind a process/ system, without knowing theory and self-confidence of doing it yourself you are limited to a level, always try to achieve possible highest qualification. Love your family, colleagues your country and your work.

Birthday Celebration

The classroom is only completed with the presence of a fantastic teacher who guides, teaches, and inspires the students. They are role models and influential figures who give society the tools to grow and succeed. And when it's

their birthday, it's time to show our appreciation by giving them a token of thanks and gratitude. The department celebrates the birthday of all the faculty members, workshop staff, and support teams. One day in a month is dedicated to the birthday celebration for all those members whose birthday lies in that particular month. They all are facilitated by presenting planters and formal wishing letters to them.

Birthdays of The Quarter

Mr. Pradeep Kumar (October, 3)
Ms. Neetu Gupta (October, 8)
Ms. Rashmi Chawla (October, 9)
Ms. Neelam Turk (October, 23)
Ms. Archna Agarwal-II (October, 24)
Mr. Lalit Rai (October, 29)
Mr. Rohit Tripathi (October, 30)
Mr. Baij Nath (November, 3)
Ms. Kalpana Sheokand (November, 11)
Mr. Dushyant Shukla (December, 2)
Ms. Priyanka (December, 21)

Message From Editorial Team

"The Student Editorial Board is delighted to offer readers a glimpse of our department through the official newsletter of J.C. Bose University of Science and Technology, YMCA's Electronics Engineering Department, called "स्पंदन." Our team sincerely thanks the leadership of Bharat Bhushan, Sangeeta Dhall, and Nisha Yadav for their capable and effective guidance and our senior colleagues for their invaluable support and expertise. What we found particularly enriching was the wealth of knowledge and skills that we gained throughout this project and the opportunity to nurture our creative sides to a considerable degree. This experience has encouraged us to rekindle our passion for creativity and innovation. We are humbled that the Department recognized our potential and offered us the chance to showcase our abilities this way.

Our fervent hope is that our readers will relish our work, acknowledge our diligence and dedication, and furnish us with insightful feedback that will enable us to refine our skills and enhance our work further.

The Editorial Team

For any suggestions and feedback, get in touch with us at: spandan.eee@gmail.com

Editorial Team:- Bharat Bhushan (AP), Sangeeta Dhall (AP), Nisha Yadav (AP)

Pre-final Year:- Armaan Alam(EEIOT), Harsh Bhawra(EEIOT), Pratham Goel(EEIOT), Shruti Yadav(ENC), Sukhman Singh(EEIOT)

Second Year: Aarusha(ECE), Anshika(ECE), Arya Mishra(EEIOT), Chirag Tyagi(EEIOT), Dolly(EEIOT), Eshita Dhar(ECE), Mishali Bansal(EEIOT), Nikita(ECE), Puneet Khoria(EEIOT), Shivam(EEIOT), Vansh Sardana(EEIOT)