

VIDAYAMI

Symbiosis Institute of Technology, Pune



DEPARTMENT OF ELECTRONICS
AND TELECOMMUNICATION

Tech magazine





VISION AND MISSION OF THE DEPARTMENT

Department Vision

To emerge as a leading source for Electronics and Telecommunication Engineering, fostering globally proficient engineers to meet the demands of evolving industry and society.

Department Mission

1. Foster collaboration with industry to facilitate the acquisition of cutting-edge technologies and contribute to the generation of up-to-date knowledge, enhancing employability and sustainability.
2. Encourage innovation, research, and development, creating an environment conducive to higher education, entrepreneurship, and lifelong learning
3. Cultivate leadership qualities infused with social and ethical values, providing a platform for their development.

FOREWORD

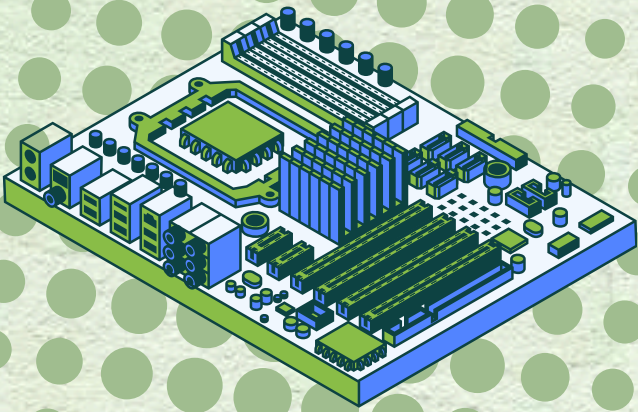
The technology field is an exciting place to be right now. Every day brings new problems to solve and new ways to push boundaries. As future engineers, this industry will rely on your fresh perspectives and enthusiasm to drive innovation forward into the future.

Stay curious! The world of electronics and telecom changes so quickly. Believe in yourself. You each have unique talents and a drive to make a difference. Your ideas and creativity will undoubtedly help shape where this industry heads next. Know that success isn't just about achievements or awards. It's also about the positive impact you make. Have passion for what you do. Be determined even when it gets tough. With that motivation guiding you, I know you all have incredibly bright futures ahead. Best of luck in your studies and beyond!

Dr. Prabhat Thakur



SUSTAINABLE TECH



“There is no planet B.” —
Emmanuel Macron

“Sustainability is the
key to our future, and
technology is the key
to our sustainability.”
— John Elkington

QUANTUM DOTS

Let us imagine you are holding a tiny grain of sand, so small, it's almost invisible to the naked eye. Now, just think that this grain can do something special that normal materials can't. At their core, quantum dots are nanometer-sized semiconductor particles, typically made of elements like cadmium (Cd), selenium (Se) or indium arsenide (InAs). Their difference lies in their size. Due to their size in nanometers, they start to exhibit unusual properties. Their electrons are confined in all three spatial dimensions, which changes how they interact with light and electricity. In larger (bulk) materials, electrons move freely, generally allowing energy to spread out equally. But in quantum dots, the confined space forces the electrons to behave differently. This phenomenon is known as quantization. Quantization causes quantum dots to have discrete energy levels unlike conventional materials that have a continuous range of energy levels. As a result, when energy is added to a quantum dot, it doesn't spread out smoothly like it would in larger materials. Instead, the energy behaves in a quantized way, leading to very specific and size-dependent energy transitions. For example, smaller quantum dots tend to absorb and emit higher-energy light (e.g. blue or ultraviolet light), while large dots emit lower-energy light (e.g. red light). This size-dependent behavior means that energy distribution in quantum dots is much more discrete and controlled. By adjusting their size and material, scientists can tune their optical and electronic properties to suit specific applications, making them useful in everything from displays and lighting to data transmission systems. Some of their key features are, tunable emissions, high efficiency and narrow emission spectra. Unlike traditional materials, the color of light emitted by quantum dots can be finely controlled by adjusting their size. Apart from that, they can emit light in very narrow spectral bands. This makes them extremely suitable for optical communications systems.

Applications of Quantum Dots

One of the most exciting applications of quantum dots in telecommunications is in photonic communication systems. They can be used to create highly efficient light-emitting diodes (LEDs) and lasers that operate on specific wavelengths, improving the performance of fiber optic networks. By using this, we can reduce signal loss and noise, which are critical factors in reliable data transmission. Moving further, quantum dots are making waves in the field of quantum computing. Their ability to confine electrons in discrete energy states is essential for the development of quantum bits or qubits. Unlike the traditional bits, qubits can exist simultaneously in multiple states. Quantum dots are also being investigated for use in solar cells to capture and convert light to electricity. They are also being explored for use in transistors, specifically called quantum dot transistors (QDTs), which are a new frontier in nanoelectronics. The flexibility of QDs, particularly in quantum dot films and quantum dot inks, allows them to be integrated into flexible electronics.

Challenges and Future Prospects

While quantum dots hold immense promise, there are still challenges which need to be overcome. The toxicity of certain quantum dot materials (like cadmium) has raised concerns, particularly in large-scale manufacturing and consumer electronics. Research is ongoing to develop eco-friendly alternatives and improve the scalability of quantum dot production. As we move towards next-generation technologies like quantum communication systems, the role of quantum dots in enabling faster, more secure communication will continue to grow.

The Mathematical View of Quantum Dots

We know that the energy levels depends on L^2 , which represents the size of the quantum dot. As the dot becomes smaller (i.e., as L decreases), the energy gap between these quantized levels increases. This results in the characteristic size-dependent optical properties of quantum dots. In practical terms, the energy associated with the absorption or emission of photons can be written as

$$E_{\text{photon}} = h\nu = \frac{hc}{\lambda}$$

where,

E_{photon} is the energy of the emitted or absorbed photon,

ν is the frequency of the photon,

c is the speed of light in a vacuum (299792458 m/s),

λ is the wavelength of the photon.

The effective band gap E_g of a quantum dot is also related to the L of the dot. It can be approximated by

$$E_g = E_{\text{bulk}} + \frac{C}{L^2}$$

where,

E_{bulk} is the band gap of the bulk material,

C is a constant that depends on the material and its electron properties,

L is the size of the quantum dot.

This equation shows that as the size of quantum dots decreases, the effective band gap increases, leading to a shift in the emission wavelength to higher energies

The introduction of electronics into the medical field marked the inception of a new era of innovation, which delivered and transformed patient outcomes in health care. The electronic technologies shifted from diagnostics and treatment to monitoring of patients and management of data bridging crucial gaps through increasing the precision, efficiency, and accessibility of medical services. There is an enormous realm of medical electronics like instrumentation for life support, patient monitoring, hearing aids, and pacemakers.

While a century ago such a thing called a medical device had never been heard of, two of the most important devices to rise during this time have left an indelible mark on the field of medicine practice and today stand as foundational technologies. First is the stethoscope. The first was invented in 1816 by the French physician René-Théophile-Hyacinthe Laennec. To this day the modern stethoscope has also moved beyond being an emblem of medicine, but also as a more established, regularly used diagnostic equipment. The second piece apparatus dates back over 100 years ago, but only for a brief time, is the first medical X-ray imaging device. X-rays were discovered in 1895 by Wilhelm Conrad Roentgen, who discovered them as penetrating the human body and revealing skeletal structures. This discovery was applied clinically within a year from when it was made and has since then been the keystone of medical imaging. In 1901, the Nobel Prize in Physics was awarded to Roentgen for his discovery and description of X-rays.

Healthcare systems have started to rely much more on electronics in order to enhance the quality of a patient's life and advanced diagnostic and treatment technologies. Electronic medical devices, sensors, and diagnostic equipment enable physicians to be always in contact with what is happening to a patient at any time and receive accurate data about the functions going on in the human body. Electronic medical devices include such equipment as pacemakers, cardiac monitors, and mechanical ventilators. Each one of these has stood up to be vital in the management of so many diseases: monitor and regulate vital body functions that would be heart rate, breathing, and blood pressure, therefore supplying necessary information to the health professional.

Sensors have also improved diagnostics. For example, glucose sensors allow diabetic patients to continuously monitor their glucose levels in the blood for timely management of their disease. Sensors can also be used to monitor brain activities, intracranial pressure, and other vital functions. Diagnostic equipment forms the backbone in any medical electronics. Computed tomography, magnetic resonance imaging, and radiography allow the internal view of a human body, helping with the diagnosis of many health conditions. Electronic information systems allow the record and analysis of patient's health data, hence giving a more accurate view and effective treatment of the patient.

However, bringing electronics into healthcare comes with several challenges. Aside from the security requirements to preserve the privacy and data of patients, appropriate security measures are obligatory. Proper calibration and maintenance of electronic medical devices may prove to be crucial in avoiding failures that could lead to a possible danger for the patients' safety. Healthcare workers should be enlightened on how to utilize the output of the electronic device in its interpretation. It will then be in a position to offer effective treatment if these are therefore utilized with the intention of improving the quality of a patient's life and advancement of medicine. In electronics, an aspect that serves for the development of the quality of life of patients and advancement of medicine is found.

Key Advantages:

1) Enhanced Functionality:

Enables real-time monitoring, data collection, and feedback, improving diagnostics and treatment outcomes.

2) Precision and Control:

Enhances accuracy in surgical tools and devices for precise movements and measurements.

3) Imaging and Visualization:

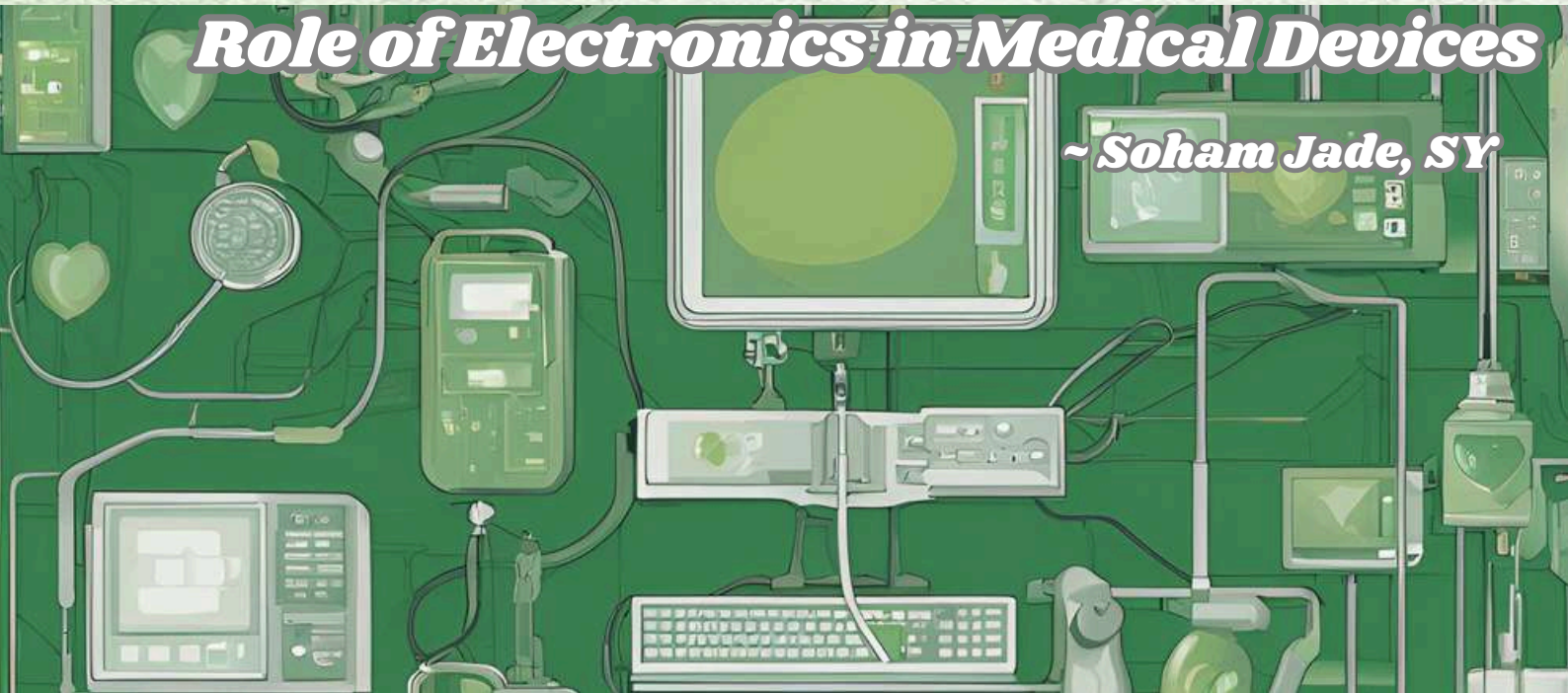
Powers imaging technologies like ultrasound, providing real-time visuals for accurate diagnoses.

4) User Interface:

Integrates intuitive controls like touchscreens and voice commands, improving usability for healthcare professionals.

Role of Electronics in Medical Devices

~ Soham Jade, SY



Li-Fi Technology

"WIFI, BUT FROM LIGHT."

~ *Priyansha Gour, FY*



"Simply point your mobile towards a light bulb to surf the web. "

LiFi is a coming-of-age technology, discovered in 2011 by German physicist Harald Haas, that only requires a light source with a chip to transmit an internet signal through light waves. It is a bidirectional wireless system that transmits data via LED or infrared light, unlike wifi, which uses radio frequency. Let's try to understand it better.

WHAT IS Li-Fi?

Li-Fi is a light communication system that is capable of transmitting data at high speeds over the visible light, ultraviolet, and infrared spectrums. This technology is similar to Wi-Fi – the key technical difference being that Wi-Fi uses radio frequency to induce an electric tension in an antenna to transmit data, whereas Li-Fi uses the modulation of light intensity to transmit data.

Li-Fi stands for Light Fidelity. In place of Wi-Fi modems, Li-Fi would use transceivers fitted with LED lamps that could light a room as well as transmit and receive information. By adding new and unutilized bandwidth of visible light to the currently available radio waves for data transfer, Li-Fi can play a major role in relieving the heavy loads which the current wireless system is facing.

HOW IT WORKS?

A LiFi network uses the light from LED lamps to send data to a device and infrared light from the device to transmit data back. Multiple lights can be added to a single network allowing you to move around a space from light to light without any interruption to the connection.

Let's understand the structure and components of a Li-Fi setup. It mainly consists of a high brightness white LED which acts as transmission source and a silicon photodiode with good response to visible light as the receiving element.

Each LiFi lamp acts as a transmitter and receiver, sending out and collecting data from nearby users. Although you can't see it, the light is changing its intensity billions of times a second – this change in the intensity becomes a digital signal which carries information from the internet to the user and back again.

In a typical setup, the transmitter (LED) is connected to the data network (Internet through the modem) and the receiver (photo detector) on the receiving end receives the data as a light signal and decodes the information, which is then displayed on the device connected to the receiver. The receiver (photo detector) registers a binary '1' when the transmitter (LED) is ON and a binary '0' when the transmitter (LED) is OFF.

The intensity modulation cannot be seen by the human eye, and thus communication is just as seamless as other radio systems, allowing the users to be connected where there is LiFi enabled light.



Li-Fi Vs Wi-Fi

1) For ease of understanding, let me start by stating the fact that Li-Fi has a band frequency of 200,000 GHz which is 100 times faster and can transmit much more information per second than the maximum 5 GHz of the Wi-Fi. Li-Fi speeds surpass Wi-Fi, the fastest known type of Wi-Fi, with a transmission rate of 224 Gbps.

2) It was found in a recent study conducted by University of Eindhoven, that Li-Fi has a download rate of 42.8 Gbit/s considering infrared light with a radius of 2.5 metres, when the best Wi-Fi would barely reach 300 Mbit/s.

3) The most important application of Li-Fi technology is in Airplanes. Li-Fi enabled lighting will allow high data rate connectivity for each passenger. It will allow connectivity at all times, without creating electromagnetic interference (EMI) with sensitive radio equipment on the flight deck. The reduction in cabling requirement also means a lighter aircraft.

4) Another great use of Li-Fi technology is underwater. Radio waves are quickly absorbed in water, preventing underwater radio communications, but light can penetrate for large distances. Therefore, Li-Fi can enable communication from diver to diver, diver to mini-sub, diver to drilling rig, etc.

5) Hospitals are a specific case of an environment where both EMI sensitivity and security of data are issues. Li-Fi can enable the better deployment of secure networked medical instruments, patient records, etc.

RECENT DEVELOPMENTS AND RESEARCH:

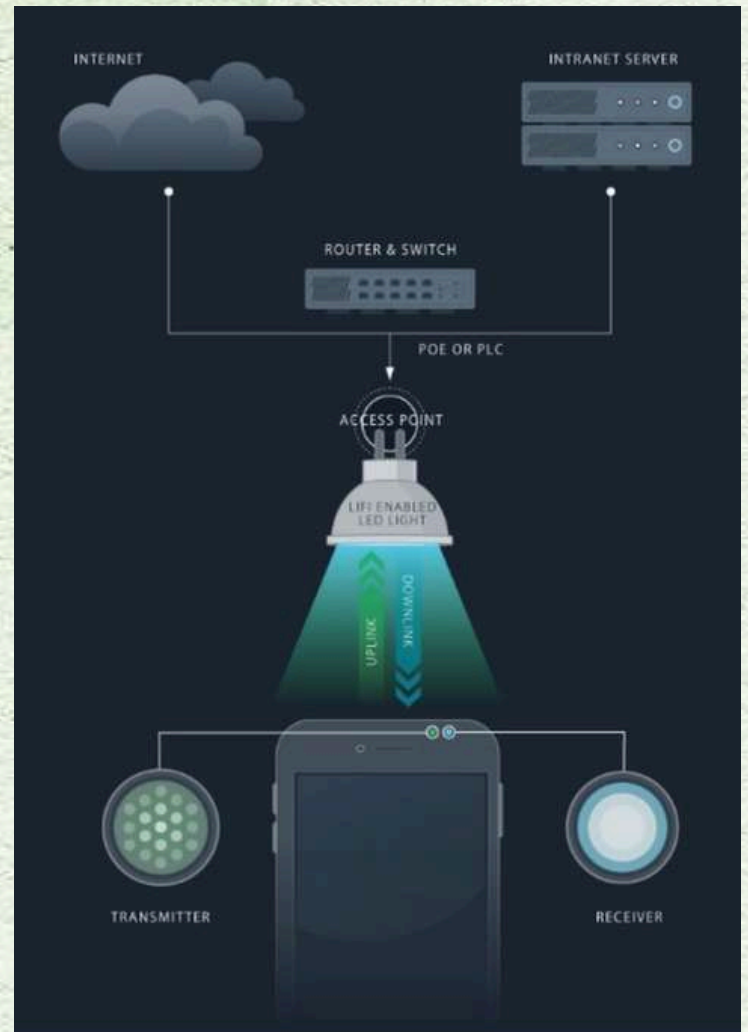
Many companies such as Signify, PureLi-Fi, Oledcomm and VLNComm have foreseen the profitable growth of the market in Li-Fi technology and have started the production and sale of various Li-Fi operated devices.

The market for Li-Fi-based products is estimated to be worth USD 1.72 billion in 2024. Further, it has a CAGR of around 63% for the forecast period of 2024-29.

Moreover, it is interesting to note that in a recent project held in October 2019, the OLEDCOMM company announced that it had reached a connection speed of 1 Gbps on board a commercial aircraft, thanks to Li-Fi technology. This is the first time that a company has equipped a commercial aircraft with modems of the technology, an Airbus A321 providing the Paris-Toulouse link, in this case.



Faster, more secure, more ecological and above all as inexpensive as Wi-Fi, Li-Fi technology could constitute, in the future, the ideal way to broadcast a very high speed connection on board an aircraft. Such advancements showcase that the future is about high data transmission rate, that is not only highly secured but also incredibly energy efficient.



CONCLUSION :

To sum up, Li-Fi represents an exciting leap forward in wireless technology, using light to deliver data at incredible speeds while enhancing security and reducing interference. Although it has some practical challenges—like needing a clear line of sight and limited range—it holds unique advantages for settings that need reliable, secure communication, such as hospitals, airplanes, and even underwater operations. As Li-Fi continues to develop, it has the potential to work alongside Wi-Fi, creating a blend of technologies that cater to different needs. With its rapid progress, Li-Fi could soon become a key player in how we stay connected in a world that's always demanding faster and safer data transfer.

From the dawn of time the world is constantly evolving from stone age to the modern world, from telephones to modern day smartphones, from giant computers to laptops we've come a long way, but one thing that is common in all these inventions is the use of wires/cables that power these electronic devices however the hassle of managing all those wires is a bit of a task, isn't it? what if there was a mechanism that could power our device wirelessly without actually connecting it to a physical source, fascinating right, but what is more fascinating is that this futuristic concept is being widely used and implemented by industries and manufacturers all across the world and is known by the name WIRELESS POWER TRANSFER.

Very much in sync with its name Wireless power Transmission or Wireless power transfer popularly known as WPT is the transfer of electrical power from one point source to another without the intervention of any connector or wire. It enables a channel to power appliances without the hassle of connecting them to a physical power source. The working principle of WPT is based on a very famous concept of classical Physics known as The Electromagnetic Induction (EMI). In simpler words what EMI states that is when a conducting coil is exposed to current it generates a magnetic field, when a second coil is brought into the radius of the magnetic field of the first coil, a current is induced in the second coil due to the magnetic field of the first coil hence allowing the power to transfer between the two points eliminating the need of an actual wire to do the job.

The wireless power transfer system in general consists of a device that transmits the power known as the power transmitter and a device that receives the hence transmitted power known as the power receiver while this might resemble the traditional power transfer layout but what makes this one interesting is that here the receiver and transmitter is not connected with any wire or cable rather, they are connected with a wireless link that enables the path for the power transfer. This method of transfer is Commonly used in devices that are based on time varying electric, magnetic or electromagnetic field.

ADVANTAGES AND CHALLENGES:

The method of transferring power wirelessly is extremely convenient as it eliminates the need of physical connectors, this advantage of WPT enables the possibility of power transfer in difficult terrains like dense forests and remote locations. When the world is looking for and adapting greener solutions, WPT will help us reduce our carbon footprints and hence reduce pollution. All of us have seen those congested lanes with tons of wires and cable hanging around, adapting WPT will help us maintain the aesthetic of our cities and will help save thousands of birds and animals that lose their lives every year due to these wires and cables.

While all of this might sound promising there still remains many challenges to the implementation and usage of WPT in the real world, range, cost and Energy loss being a few of them.

WIRELESS POWER TRANSFER: "cut the cord" ~ Mantavya Anand, FY

APPLICATIONS:

The applications of Wireless power transfer are unimaginably vast yet convenient, scaling from powering primary consumer electronics to charging EV's. With WPT charging EV's would be very convenient all that is requires is simply parking over the charging port and before you know it your vehicle would be ready for your next destination. Wireless power is exceptionally valuable for implanted medical devices, wireless power transmission can provide an alternative for wireless power in implantable medical devices like pace makers and insulin pumps.

CONCLUSION:

In its core Wireless power transfer has the ability to change our outlook to power transmission as well as its advantages, while challenges remain, the advantages of WTP in the above stated contexts are well enough of a driving force for its advancements and adaptation. WPT has the ability to open new doors of possibilities of a future where wires and connectors are obsolete, where there will be sustainability and energy solutions for generations to come.



The background of the page is a dark green color with a complex pattern of golden-brown lines and shapes. These lines resemble the veins of leaves or a network of roots, creating a textured, organic feel. The lines vary in thickness and direction, some running vertically, others horizontally or diagonally, and some forming loops or clusters.

**STUDENT
DEVELOPMENT
PROGRAMME 2024**

A Tech-Filled Journey: Our SDP Experience



The EnTC department students of second year embarked on a thrilling journey through the realm of technology during the recent “Skill Development Program“ aka SDP. Though it was just a 5-day program, it turned out to be an enriching and a transformative learning experience where through these 5 days, students came across 4 different sessions including:

- 1) **Embedded Fundamentals using IOT Platform**
- 2) **Basics of MATLAB - Arrays, matrices, operations, MATLAB built-in as well as user-defined functions with examples.**
- 3) **5-G Lab Demo**
- 4) **Bajaj Lab Control Systems Demo**

The SDP began with a deep delve into the world of embedded systems and IoT, where students gained hands-on experience with microcontrollers and sensors. The session was conducted by a pioneering startup known as CopperCloud. Students interacted with and learned from people currently working in the field and gained a better understanding of the fundamental embedded systems principles in a real world setting. Learning while doing was practiced first hand, which helped ignite curiosity and kindle a passion for the new subject among the second years.

Up next, the hands-on MATLAB workshops were especially enlightening, empowering the second years to harness the power of this versatile tool for data analysis and simulation. Later, a session on 5G technology was led by Dr. Prabhat Thakur, which covered the evolution of mobile networks from 1G to 5G technology. The comparison between Wi-Fi 6 and 7 provided valuable insights into the latest advancements in wireless connectivity.

The Bajaj Lab demonstrations were surely one of the main highlights of the program. Students witnessed the practical applications of electrical engineering principles. From understanding the fundamentals of circuits to exploring complex security systems, the experience was truly informative.

The sessions were conducted by industry experts along with some of the faculty members on campus who shared their valuable insights and experiences. The hands-on demonstrations were a great way to reinforce our learning and applying the theoretical concepts practically.

Overall, the SDP was a fantastic opportunity to expand our knowledge and skills.

INDUCTION

A New Journey Begins!

To ease our transition into college life, Symbiosis Institute of Technology hosted a special orientation event aimed at familiarizing new students with the campus, faculty, and each other. It was a 14 days event, with a fully packed schedule of a plethora of activities planned for the newly admitted Symbians.

The event started off with an Inaugural & Commencement Ceremony at the SIU Auditorium. After the lamp lighting ceremony, Dr.Ketan Kotecha (Director SIT) addressed the gathering of students and parents. This was followed by different faculty members addressing the audience on various essential topics such as rules and regulations, placements, departmental overview and campus life.

The first day of induction ended as the students along with their parents were escorted back to the SIT hill base campus where they got a chance to explore their respective departments and also attend the departmental session by the HODs. After the departmental sessions, students also got a chance to meet with their seniors and have an informal interaction. This set the tone of the upcoming days of induction which were to be filled with immense joy and pleasure.

From the next day onwards, students were introduced to various clubs and student led societies on campus, including but not limited to :

- Mathletes, the fun and invigorating math club;
- The Entrepreneurship Club of SIT, well known as EPIC.
- The Varsity Care Club at SIT, the moral backbone of our institute.
- The engaging and inspiring Ted-MUN Club
- Brushes to Pixels, the expressive and colorful Arts and Crafts club
- The captivating and skillful Photography Club
- Soul 2 Sole, the lively and exhilarating dance club of SIT
- Mosaic, the energetic and transformative drama club of SIT

These various clubs and their activities for the students made the transition to student life for newcomers at sit, a very smooth and enjoyable process. With each day thoughtfully planned to be informative, enjoyable, and dynamic for students, they had far more in store than they initially realized. Every day various UHV (Universal Human Value) sessions led by faculty and staff, competitions and activities led by students, and Industry person sessions were planned to familiarize students with the norms of college and office life in a very light and enjoyable manner. Some of the competitions that took place were book review competitions, yoga sessions, sports and fun activities, etc. Sessions kicked off on a bunch of exciting topics, each one brought to life by talented professionals who knew how to engage the audience! From interactive discussions to hands-on activities, these skilled experts made learning fun and dynamic. Some noteworthy mentions are:

1. The UHV Session by Mr. Madan Sundar Das Director, Evolve Pune where he talked about the moral values of life and how one should behave and abide as an engineering student. The session was filled with useful insights taken directly from the Mahabharata and Bhagavad Gita.

2.Session on Teenage & Social Media by Ms. Anuradha Harkare is one another example of delightful yet informative session where she explored topics and ideas such as turning social media into an asset instead of a liability which made students connect and enjoy her session to the fullest.



3. Session on Interpersonal Skill Development by Ms. Shakina Mohol, Cambridge Expert where she talked about various skills a young professional should have and how to develop them without taking too much load on oneself. She explored the idea of turning hobbies into Interpersonal skills and also provided statistical data on how amazingly it works.

4. Session on Startup Ecosystem by Dr. R. Ganesan, Chief Financial Officer of Modern Education Society, Pune was yet another wonderful session where Dr. Ganesan enlightened the audience with his thought-provoking narratives about entrepreneurs and the idea of building a startup.

5. Session on the Importance of Engineering by Mr. Dinesh Anantwar, Mentor and Life Coach (ex-Head Education at Infosys-Pune) was a session that allowed many lost minds to reconstruct their pathways of career with techniques backed up by scientific data and analyze their growth in one of the most competitive fields in the world.

6. The session on Gender Sensitization by Dr. Jyoti Chandiramani, Director of Symbiosis School of Economics was more of an important discussion where students got a platform to put forth their ideas on the topic and talk openly about the things unheard by most.

7. Session on Diet & Nutrition by Prof. Atul Gokhale, Director, SSCA was a very necessary session especially for students living in hostels and as paying guests. It provided useful lesser-known factual knowledge to students for keeping their health and fitness on point.

8. Session on Entrepreneurship & Innovation by Mr. Amol Nitave, CEO & Founder of EvolvingX, Co-founder eXploreVR - this was a session that touched hearts as our speaker Mr. Nitave his struggles as a budding entrepreneur and talked about the hardships that come with dreaming towards the end, he talked about the recognition he received from Sir Ratan Tata and social positivity he brought about through his struggles.

Each of these sessions was incredibly grasping and informative for students and focused on providing them with firsthand knowledge from the industry experts themselves. The Induction was not just about fun activities and guest lectures from industry professionals, it was about learning about our college, our branch and our campus. Many parents and students also got a chance to interact with the staff and faculty of the ENTC department. Interactions with the department faculty empowered students to seek answers to their queries, be a part of important technical global organizations such as IEEE, participate in the happenings of the college, and learn each step of the way. First-years who were nervous about the huge change and step ahead in their lives were cared for by their mentors who helped them feel emotionally and mentally secure at all times and readily solve any issues they may have had.

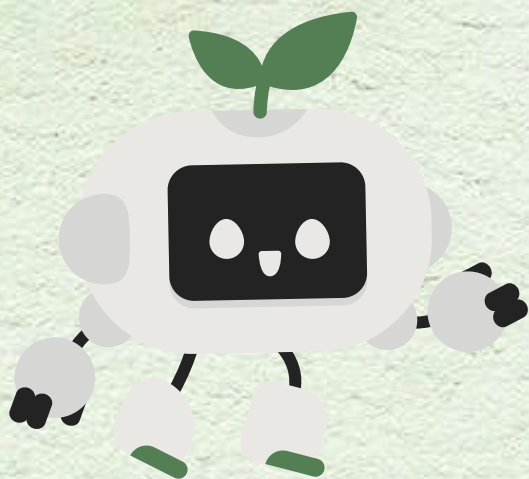
The Induction Program 2024 came to an end with energizing and lively performances of the trio band concert by Nitin Satav, a Dance Workshop by Diksha Masurkar, a performing Artist, a dance teacher & the founder of Samnriya and Zumba workshop at the SIT Amphitheater. Students sang along and danced their hearts out as the days of induction came to an end and prepared for the onset of their college journey with hearts full of joy and minds deprived of worries.

Here's what the students had to say about the Induction Programme:



9. Session on Technical Storytelling by Dr. Deepesh Chandran, Business Storytelling Coach, TEDx speaker, Professional Storyteller, and Keynote Speaker - this was one of the most enjoyable sessions that kept the audience actively listening and engaged till the end. He showcased how to use linguistic proficiency and use gestures to make everything we say interesting.

10. Session on Internationalisation by Prof. Anita Patankar, Director of the Symbiosis Centre for International Education, and Founding Director of the Symbiosis School For Liberal Arts, Pune in which he talked about the role of Internationalisation in the overall personality development of an individual and how it affects one's professional and emotional well-being.



My induction experience from August 1st to 15th was truly exciting and memorable, as I got introduced to various clubs like Mosaic, S2S, BTP, technical clubs and many more. I especially liked the Mosaic Club activity, WWR Club introduction, and the guest lectures from our esteemed dignitaries which gave me a chance to discover new interests, connect with others, and feel a real sense of belonging as I begin my college journey.

~ Mishree Kalaria, ENTC A FY

REVERB

CULTURAL FEST OF SYMBIOSIS INSTITUTE OF
TECHNOLOGY, PUNE



The Month of October was nothing short of a musical and artistic masterpiece for SITians



It holds the commencement of the multi-dimensional extravaganza of culture and cinema- REVERB, the annual cultural fest of Symbiosis Institute of Technology organized by the cultural committee of our esteemed Institute. Reverb is known for its exciting lineup of events and breath-taking artist nights and this year was no exception, the fest kicked off with events like music-bonfire night, movie under the stars, ice breaker and swiftly followed by the highly awaited Prom night.

Laser Tag

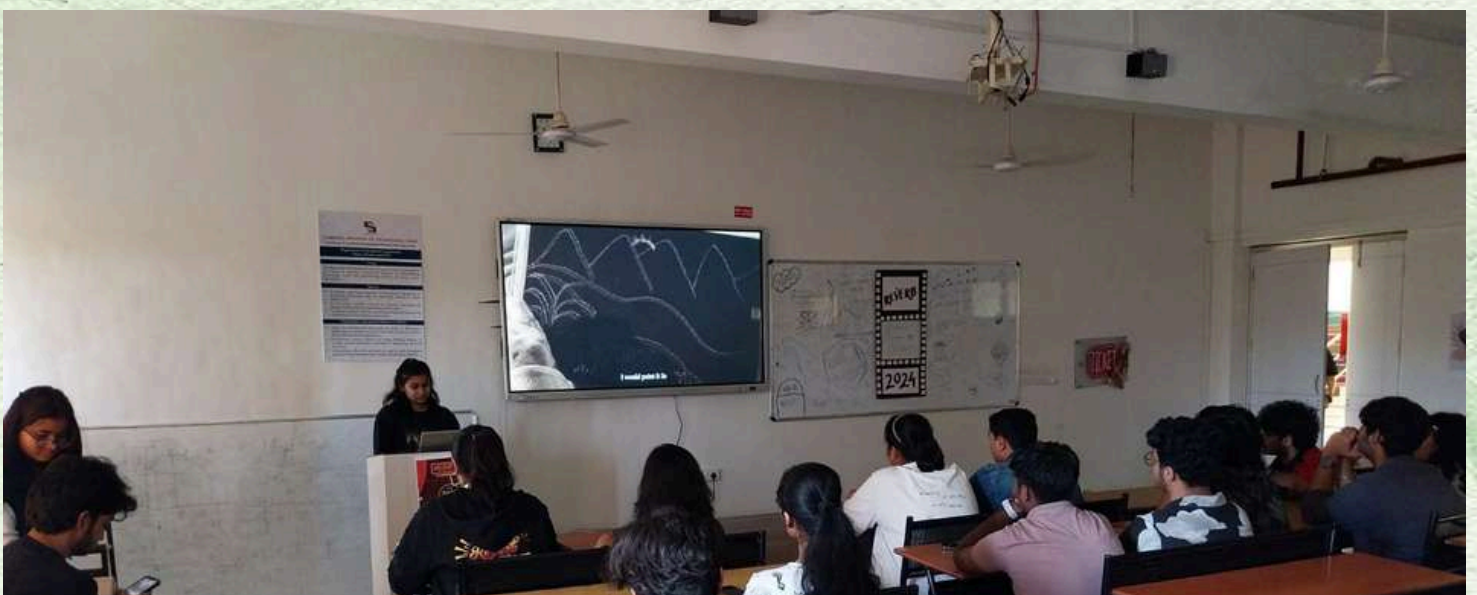
On 4th and 5th of October, over 25 events were conducted in the SIT premises. One such event to discuss today is the Star Wars (laser tag) game which was co-headed by Manya Gupta (S.Y.). This was a fast paced team-based game where players tried to score points by “tagging” opponents with their laser while avoiding being tagged themselves.



We are delighted to bring attention and recognition to the skilled team that worked behind the scenes to fashion fun game equipment from laboratory instruments, and proud of the technical and non-technical efforts that made this event memorable for everyone involved.



What casual onlookers might miss, however, is that the equipment for the game was handmade and created by our very department!



INDUSTRY VISIT





On 19th October 2024, the 2nd-year Electronics and Telecommunication students participated in an industrial visit to the company named Devise Electronics known for its forefront in providing new technologies to the world of electric vehicles (EVs). The company was founded in the year 2013 by Mr. Shekhar Malani and incorporated by the year 2015. It has since then successfully incorporated a workforce of 70-80 professional engineers and have worked on over 70+ projects. The company is based in Bavdhan, Pune.

Students traveled to the facility by bus and upon arriving at the assigned location, were introduced to Mr. Manas Vora, a former member of the Devise team, who led the tour into their workplace and provided a brief introduction into their working and the type of projects the company works on.

The industrial visit students were first introduced to a simulation model of a four-wheeler electric vehicle which could operate to simulate different driving scenarios. This interactive experience allowed a better understanding of the electronic and mechanical dynamics of EVs. Further the learners were shown 2 different semi-assembled models of electric scooters which helped conceptualize the batteries used, their design and the difference in power. They were also given a demonstration of different kinds of batteries available and used in the global market. The students also learned how IoT in EVs enables real-time data collection, remote monitoring, and predictive maintenance, enhancing vehicle performance and safety.

The entire session was highly interactive, effectively engaging both the presenters and the students. It offered a well-rounded blend of practical and theoretical knowledge about electric vehicles (EVs), undoubtedly igniting a vivid curiosity in the young minds present. The discussions encouraged students to ask questions and share their thoughts.

Throughout the session, Mr. Vora and his colleagues provided valuable insights into the latest industry trends, various specialized career paths available in the field, and the impact of IoT-driven technologies on the future of transportation. Their expertise not only helped the students but also inspired them to consider the possibilities within the EV sector, making the experience both educational and motivating.

devise
Electronics Private Limited

ATHLETICS

Sports Fest 'PROTATHLITIS : A Celebration of Sportsmanship!'

The annual college sports fest, Prota, was officially flagged off on 14 October, showcasing the incredible talents of students across various branches. This year, the Electronics and Telecommunication (E&TC) branch truly made its mark, participating in 21 sports and achieving outstanding results.



Our branch has Champions in:

1. Badminton (Girls)
2. Lawn Tennis
3. Swimming
4. Best Physique (2 Categories)

Under the leadership of our dedicated Branch Representative

Daniyal Khan, E&TC

demonstrated exceptional skill and sportsmanship throughout the fest.

Victorious Moments:

E&TC's Wins



Runners-Up: Strong Contenders

Our teams also put forth impressive performances, earning runner-up positions in the following events:

- Basketball (Mixed)
- Handball
- Throwball
- Dodgeball (Girls)





M.V.P.S.

We are incredibly proud to recognise our Most Valuable Players (M.V.P.s) who stood out in their respective sports:

1. Badminton (Girls): Anusha Singh (4th Year)
2. Throwball: Daniyal Khan (4th Year)
3. Handball: Michael Ningombam (4th Year)
4. Basketball: Manvendra Singh (4th Year) & Anushka Shinde (2nd Year)
5. Volleyball: Hemant Kumar (4th Year) & Vartika Sharma (3rd Year)
6. Dodgeball: Shivansh Chutani (4th Year) & Sherlyn Tiwari (2nd Year)
7. Lawn Tennis: Arjun Gohad (3rd Year)
8. Swimming: Shresht (2nd Year)
9. Best Physique: Shailesh Nair (3rd Year) & Aryan Gawande (1st Year)
10. Pool: Daniyal Khan (4th Year) & Devansh Chachra (3rd Year)
11. Kabaddi: Piyush Anand (3rd Year) & Prithvi (4th Year)
12. Badminton (Boys): Aryan Shakti (4th Year) & Sanidhya Pratap (3rd Year)
13. Chess: Sanusha Menon (3rd Year)
14. Football: Aniket Prasad (4th Year) & Mohit (2nd Year)
15. Cricket: Aryan Thipse (4th Year) & Deepak Sahu (4th Year)



Celebrating Team Spirit

The Prota 2024 sports fest highlighted the athletic prowess of the EnTC branch and fostered camaraderie and team spirit among participants. Each match was a testament to our athletes' hard work, determination, and passion.



As we look back on this year's achievements, the EnTC branch stands proud, having showcased our capabilities on such a vibrant platform. Congratulations to all participants, especially our *M.V.P.s*, for their exceptional performances and contributions to our branch's success!

Stay tuned for more highlights and stories from Prota 2024 as we celebrate the spirit of sports in our college!



IEEE ENGINEERING
EDUCATION & YOUNG
PROFESSIONAL CONGRESS

2024

Overview

The IEEE R10 YP UpSkill IEEE Engineering Education Student & Young Professionals Congress which was supported by IEEE Region 10 Young Professionals and the global IEEE Young Professionals congresses, provided a multifaceted and integrated program that was centered on modern technologies and opportunities in engineering and technology education. This was a special event in honor of the 140th year of the founding of the IEEE, with insights offered by distinguished speakers and leaders in the fields of AI, Machine Learning, and Electrical Engineering along with their audience. The sessions included the students and other professionals and members of the IEEE as well as emphasis with regard to engineering education with the aim of developing in difference.

Schedule & Key Sessions

Inauguration & Plenary Talk

Time: 10:00 AM – 11:30 AM

Formally addressing the audience, Mr. Coughlin commenced the eloquent proceedings of this conference with due honor to the achievements of IEEE's life span when addressing the audience present on this date. Following this, the audience was addressed by Thomas M. Coughlin, President IEEE, who praised the 140 years history of IEEE as he celebrated the tools that IEEE built. Cultural empires were fueled with ideas free and created what seems to be the most complex advancements and modern-day achievements.



Conclusion: Day 1

The IEEE R10 YP UpSkill Congress proved to be an insightful event for both students and professionals, offering up-to-the minute smarts and real-world applications of AI, machine learning, and electrical engineering advancements. With networking sessions that encouraged association, the event supported IEEE's commitment to inspiring the next generation of engineers. This congress not only highlighted technological achievements but also provided students with inspiration and a roadmap for their future in engineering.



Keynote Address

Time: 11:40 AM – 01:00 PM

This responsibility was tackled by Mr. Murari Ramuka, a Gen AI and AI Specialist at Google Inc, India, who provided the keynote. The subject was entitled: 'Generative AI: The Future of Creativity and Innovation". It was a truly enriching experience and an insightful lecture.

The final segment of the symposium, held from 5:00 PM to 7:00 PM, centered on opportunities within the IEEE Future Networks Community for 5G enthusiasts. This session covered avenues for young engineers interested in 5G and included an introduction to IEEE Collabratec, VTS, and Signal Processing. Discussions highlighted the transition from student to young professional, stressing the importance of leveraging ComSoc resources to build successful careers in the communications field. Networking opportunities further allowed participants to connect with experts and peers, fostering collaboration and engagement within the IEEE community.

DAY 2

Overview

The IEEE MTT-s Students & Young Professionals Symposium brought together a diverse group of students and professionals eager to explore advancements and career opportunities in smart grids, communication networks, and emerging 5G technology. With engaging hands-on sessions led by distinguished speakers from academia and industry, the event emphasized both technical knowledge and professional development, providing attendees with insights into the latest trends and possibilities in the engineering domain.

Morning Sessions

The morning consisted of two enriching sessions comprising talks on the smart grid technology and professional scopes in the field of communications.

1. Powering the Future: Exploring Smart Grid Research and Career Opportunities Talk by Dr. Balijepalli Venkata Sita Krishna Murthy

He is the secretary of Region 10 IEEE Power and Energy Society, currently working in Liteon Technology in Singapore as a Master Engineer. Dr. Murthy presented a session titled Powering the Future: Exploring Smart Grid Research and Career Opportunities, where he illustrates the place of smart grid technologies in advancing sustainable energy systems by demonstrating how smart grids integrate modern technologies—even open up new career pathways for aspiring engineers in the energy sector.

2. Empowering the Next Generation: Engaging Students and Young Professionals through ComSoc YP and Opportunities in the Communications Domain Session by Mr. Anjaneyulu Devarasetty

The session was taken by the Associate Engineer of L&T Technology Services, Mr. Devarasetty, on the topic Empowering the Next Generation: Engaging Students and Young Professionals through ComSoc YP and Opportunities in the Communications Domain. It inspired the young engineers to engage with IEEE Communications Society (ComSoc) and all the developments they may experience with their careers in professional societies.

Afternoon Session

The afternoon session began with Dr. Prashant R. Nair from Amrita Vishwa Vidyapeetham. His presentation, titled Innovation & Technology Readiness Levels (TRL), provided an overview of the TRL framework and its application in the innovation process. Dr. Nair emphasized how technology readiness assessments can streamline the development of new technologies, preparing them for real-world deployment and commercial use.

Cultural Programme and Skill Center Visit

From 3:40 PM to 4:30 PM, attendees enjoyed a cultural program and a visit to the Bajaj Engineering Skill Center (BEST), where they observed practical applications of engineering skills in industry-focused settings. The experience allowed participants to witness firsthand how theoretical concepts are translated into industrial practices.



Midday Session

Following a short break, the symposium resumed with an in-depth session by Mr. Sai Prashanth Mallellu, Chair of the Student Engagement Committee, IEEE COMSOC Member Services Board. His session, Enhancing Communication Networks with 5G: Challenges and Opportunities, offered insights into the advancements in 5G technology, addressing both technical hurdles and potential growth areas. This session underscored the importance of 5G in modern communication networks, making it particularly relevant to those interested in telecommunications engineering.

Evening Session and Networking

The IEEE MTT-s Students & Young Professionals Symposium was a memorable event, rich in technical knowledge and networking opportunities. It successfully provided attendees with a comprehensive look into the future of smart grid technology, communication networks, and 5G innovations. By bridging academic insights with industry applications, the symposium supported IEEE's mission to prepare the next generation of engineers for impactful careers.

DAY 3

Overview

The IEEE EduConfluence: Bridging Student Members for Future Directions was an enriching event aimed at guiding students and young professionals toward emerging fields in engineering and technology. The event featured expert-led sessions covering cutting-edge topics like blockchain, image forensics, and data science, alongside celebrations of IEEE milestones and collaborative discussions among professionals.

Morning Sessions

The EduConfluence commenced with two technical sessions that provided insights into blockchain scalability and deep learning applications in image forensics.

1. Session by Dr. Kalpesh Kapoor

Dr. Kapoor, a Professor at the Indian Institute of Science Education and Research, Pune, delivered a talk on the Scalability of Blockchain Networks. His session highlighted the challenges of expanding blockchain networks to meet growing data demands, covering essential aspects of scalability solutions, consensus mechanisms, and their real-world applications. Students and young professionals found this session particularly relevant as blockchain continues to expand into numerous sectors.

2. Session by Dr. Puneet Goyal

Following Dr. Kapoor, Dr. Puneet Goyal, Associate Professor at IIT Ropar, led a session on Applied Deep Learning in Image Forensics. Dr. Goyal demonstrated how deep learning techniques are transforming image forensics, with applications ranging from detecting manipulated media to enhancing digital security. Attendees gained valuable knowledge on using deep learning for reliable and efficient image analysis, a field growing in importance with the rise of digital media and AI.

Afternoon Session

The afternoon featured a session on data science, a topic gaining significant attention for its applications across industries.

Session by Dr. Vikrant Karale

Dr. Karale, a Data Scientist with TCS's Advanced Quantz and Analytics (AQuA) division, presented Introduction to Data Science. His talk offered an accessible introduction to data science concepts, tools, and practical applications. Dr. Karale covered topics like data preprocessing, model building, and visualization techniques, encouraging students to explore data science careers. The session resonated with participants, sparking interest in the potential of data-driven insights for solving real-world problems.

IEEE VTS 75th Anniversary Celebrations and Valedictory Program

From 3:40 PM to 4:30 PM, the event celebrated the IEEE Vehicular Technology Society's (VTS) 75th anniversary, commemorating its legacy and contributions to vehicular technology advancements. Following the celebrations, the valedictory program concluded the open portion of the event, with speakers reflecting on the sessions and emphasizing the importance of interdisciplinary learning and networking.

IEEE Education Society YP Committee Meeting

The day ended with an exclusive IEEE Education Society Young Professionals Committee meeting. This invite-only session provided a platform for young professionals to discuss future directions, mentorship, and strategies to foster a collaborative environment within IEEE. The committee focused on enhancing engagement for the younger community members, helping them with professional advancement, and resource lines to make it meaningful to the IEEE network.

Conclusion

IEEE EduConfluence bridged the knowledge bridge of academics with practices, handing students the thrust of fast-evolving technological paradigms. Expert sessions, professional networking, and celebrations marked the event, extolling the commitment of IEEE in preparing young engineers for impactful careers that are created from such challenges set for a brilliant future. It educated attendees on current advancements while inspiring them to become contributors to IEEE's journey of innovation and excellence.



ACHIEVEMENTS

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FACULTY

Another feather in the cap!

A moment of pride for the Department of Electronics and Tele-communication SIT at Symbiosis Institute of Technology Pune as we proudly congratulate Dr Pritesh Shah and Dr Sumit Kumar for being listed among the top 2% scientists by Stanford/Elsevier for 2023! Your dedication and innovation has brought laurels to the department and the institute!

SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Department of Electronics and Telecommunication

Congratulates

Dr. Pritesh Shah
Professor and Head Department of E&TC

Dr. Sumit Kumar
Professor & Incharge Embedded Systems

For being among the top 2% Scientists by Stanford / Elsevier for 2023 !!!!!

SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)
(Established under Section 3 of the UGC Act, 1956) | Re-accredited by NAAC with 'A++' grade | Awarded Category - I by UGC

STUDENTS



Congratulations to Riya Ganguli, from Department of Electronics and Tele-communication SIT (Batch 2020-24), for securing a pre-placement offer of 26.19 lakhs from NVIDIA! During her internship semester, she worked with the company as a tools development intern, earning a stipend of 40,000 per month.

This achievement is a true testament to her hard work and dedication!

Congratulations to Steve Francis for starting an internship at University of Waterloo, Canada under AICTE Mitacs!!

As a third-year Electronics and Telecommunication Engineering student, this is a fantastic achievement and a testament to hard work and dedication. The University of Waterloo is known for its cutting-edge research and innovation, and we are sure that Steve will make the most of this incredible opportunity.

We wish him great success as he has embarked on this new journey. Keep up the great work, and continue to reach for the stars!



5G HACKATHON

We are proud to recognise that two teams from our department participated in the thrilling 5G/6G Hackathon organized by DoT, TCOE at IIIT Hyderabad, leading to remarkable achievements.

Securing an impressive 2nd place in the highly competitive 5G/6G Hackathon, the team of students Nithish Raghavendra, Gaurish Malhotra, and Nitya Sharma demonstrated exceptional innovation and technical expertise in next-generation communication technologies. Tasked with tackling complex challenges in the realms of ultra-fast connectivity and low-latency communication, the team designed a cutting-edge solution that pushed the boundaries of what's possible with 5G and laid the groundwork for future 6G advancements. Their project showcased deep understanding and practical implementation, impressing the judges with its potential real-world impact. This achievement reflects the team's dedication, creativity, and forward-thinking approach to revolutionizing the future of connectivity.

Here is what our HOD Dr Pritesh Shah Sir said:

I extend my heartiest congratulations to Nitya Sharma, Nithish Raghavendran (both third year E&TC students) and Gaurish Malhotra (second year E&TC student) who participated in the prestigious 30-hour 5G and 6G Hackathon 2024 and secured an impressive 2nd position among 1,000+ submissions from across India and bagged a cash prize of INR 1.5 Lakhs!

From a pool of 115 shortlisted teams out of almost 4,000 who applied, a total of 115 teams were divided into three regional groups. Top 16 teams from each group made it to the finals in their respective regions after a fierce competition. Among these finalists, our student team earned an outstanding position, highlighting the innovative prowess coming from SIT's 5G Use Case Lab. Mentioned below are the students from both the teams that participated in this prestigious hackathon, and the problem statements they worked on.

Team 1: 5G broadcasting by an IoT Enabled Rover Surveillance System for Hilly country Border Using Raspberry Pi & 5G Communication.

- Nithish Raghavendra
- Gaurish Malhotra
- Nitya Sharma
- Faculty mentors: Dr Prabhat Thakur, Dr. Harikrishnan R

Team approaches :-

Team 1: A 3-stage solution to their problem statement was envisioned and brought to life using a Raspberry Pi rover that was developed with IoT sensors and cameras which enabled real-time video and data collection. The overall system was, of course, implemented through 5G tech for ultra-fast, high speed, low-latency communication. The switch used also provided flawless data transmission that ran even in harsh areas of terrain, allowing for more efficient surveillance responsiveness.



Team 2: Network reliability in high-speed 5G/6G environments by creating an AI-driven solution for predicting network failures and optimizing maintenance schedules.

- Aditya Sthawarmath
- Adrish Purkayastha
- Alankar Tripathi
- Kautik Verma
- Faculty mentor: Dr Prabhat Thakur

Team 2: The approach to the solution utilized various technologies for enforcing network reliability in high-speed 5G/6G environments, chief among them were Data preprocessing, Feature engineering, Model selection and training, API development, optimization and validation.



THE TEAM



Nitya Sharma, TY
Team Head



Nithish Ragavendara, TY
Co- Head



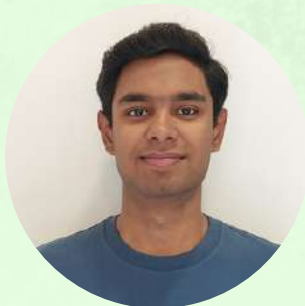
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