

SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

VIDAYAM

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING



TECH MAGAZINE

From Binary to Beyond, We Embrace Tech's Siren Song



**Edge computing
5G And Beyond
AI in Space Exploration
Asteroid Mining
Organic Electronics**

**Technovation 2023
Lectures by Industry
Experts under IEEE**

Alumini Interaction

[HTTPS://WWW.SITPUNE.EDU.IN/B.TECH-ELECTRONIC-TELECOMMUNICATION](https://www.sitpune.edu.in/b.tech-electronic-telecommunication)

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"Technology empowers people to do what they want to do. It lets people be creative. It lets people be productive. It lets people learn things they didn't think they could learn before, and so in a sense, it is all about potential." - Steve Ballmer





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

TECHNOSPHERE

Exploring the World of Technology



“Any sufficiently advanced technology is indistinguishable from magic.” - Arthur C. Clarke

Let's take a thrilling journey into the modern era in this section, where science and fantasy work together to perform their own brand of technological wizardry, changing the world in wondrous and unanticipated ways.

Edge Computing

Unleashing the Potential of Edge Computing; A Game Changer, in Our Digital Era



~ Nithish Ragavendra (S.Y.)

In today's evolving landscape we all crave for faster and more efficient data processing, whether it's within our homes, autonomous vehicles or industries such as manufacturing and healthcare there is an increasing demand for quick data analysis and decision making. This is where edge computing comes into play. A solution that is revolutionizing how we harness the power of data.

What's the Buzz about Edge Computing? Edge computing brings data processing right to its source significantly reducing the time it takes for information to travel between a data center. This enables us to make decisions making it ideal for applications like self-driving cars and real time monitoring systems. Edge computing minimizes the risks associated with transmitting data over long distances by keeping data to its origin. It has completely revolutionised the healthcare industry allowing patient monitoring, providing real time data, in operating rooms and improving the accuracy of diagnoses through AI powered tools. By reducing our reliance on centralized data centers, edge computing helps reduce our carbon footprint and supports global efforts to combat climate change.

This heightened privacy and security are especially critical in fields like healthcare and finance Edge computing bids a farewell to latency; the back-and-forth journey of data and the subsequent delays will become a thing of the past. This ensures experiences for technologies such, as augmented reality and online gaming flawless. Where is edge computing creating an impact? Smart cities are being transformed in terms of traffic management, improving safety by analysing CCTV footage and improving waste management and collection. Industrial advancements in the manufacturing sector due to edge computing is turning maintenance into practicality. Machines and robots can make decisions without depending on data centers thereby reducing downtime and expenses.

With novel technologies come challenges which can be mitigated such as:

THE SCALABILITY CHALLENGE

As edge computing becomes more prevalent, managing a network of edge devices and ensuring their coordination poses a challenge that we must address.

DATA GOVERNANCE

Given the nature of edge computing we need to pay attention to data governance and comply with regulations like GDPR and HIPAA.

AI INTEGRATION

With artificial intelligence entering the realm of edge computing there are endless possibilities for advanced decision making.

In summary, edge computing is poised to revolutionize our landscape. It enables real time data processing, swift decision making, enhanced privacy and security measures all while eliminating delays. As this technology continues to develop we can anticipate its adoption, across sectors leading to increased efficiency, sustainability and responsiveness in our digital realm. Edge computing is an advancement in the field of technology that's here, for the long haul.



5G And Beyond

Connecting Tomorrow: The Evolution of 5G and Beyond - Redefining Communication, Transforming Society.



~ Nitya Sharma (S.Y.)

5G has become an attention-seeking force in the rapidly changing world of technology, offering higher speeds, reduced latency and more connectivity. The journey doesn't end with 5G, though; rather it ushers in a new phase of wireless communication. With the development of 5G and the developments that will come after it, industries and society have the potential to be completely transformed, allowing for innovations that were previously thought to be unattainable. The advancement that came with the origin of 5G is tremendous and astounding.

The fifth generation of wireless technology is 5G, which offers substantial improvements over its predecessors. It provides faster data speeds, lower latency and ability to connect numerous devices simultaneously. These enhancements are important for several applications, such as augmented and virtual reality, autonomous vehicles, smart cities and the Internet of Things (IoT).

KEY FEATURES

5G offers greater data rates possibly up to 20 Gb/s along with lower latency i.e., 1 millisecond latency will allow for real-time communication and ultra-responsive applications. The ability of 5G networks to support a large number of linked devices will enable the rapid development of IoT devices and applications.

BEYOND 5G: WHAT LIES AHEAD

Looking beyond 5G, the focus is on enhancing the existing capabilities and addressing its limitations. The evolution towards the sixth generation (6G) and beyond envisions transformative changes and advancements that will shape the future of communication technology.

6G: PUSHING BOUNDARIES

6G is expected to revolutionize the way we interact with technology and each other. It is anticipated to bring improvements in data speeds, latency, energy efficiency, and connectivity.

Some potential features of 6G might include:

- **Terahertz (THz) Communication:** Utilizing THz frequencies for unprecedented data speeds and bandwidth.
- **Quantum Communication:** Harnessing the principles of quantum mechanics for ultra-secure and instantaneous communication.

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1. **Terahertz (THz) Communication:** Utilizing THz frequencies for unprecedented data speeds and bandwidth.
2. **Quantum Communication:** Harnessing the principles of quantum mechanics for ultra-secure and instantaneous communication.
3. **AI Integration:** Seamless integration of artificial intelligence (AI) into network operations and communication devices, optimizing performance.

ADVANCEMENTS IN AI AND EDGE COMPUTING

Integration of AI and edge computing with 6G will lead to smarter networks and devices. AI algorithms will enable networks to predict and adapt to user behaviour, optimizing network performance and energy consumption. Edge computing will process data closer to its source, reducing latency and enhancing real-time applications.

SATELLITE COMMUNICATION AND LEO CONSTELLATIONS

Leveraging low Earth orbit (LEO) satellite constellations will extend connectivity to remote and underserved areas. High-speed, low-latency satellite communication will become an integral part of the global network infrastructure.

SOCIETY AND INDUSTRY IMPACT

The advancements in 5G and beyond will have a profound impact on numerous sectors: In the health sector, improvised connectivity will facilitate remote patient monitoring, telemedicine and real-time data analysis for better healthcare outcomes. Coming up to the transportation sector, autonomous vehicles will benefit from ultra-low latency and real-time communication, ensuring safe and efficient transportation. Moreover, in smart cities IoT and 6G will enable efficient urban planning, traffic management, energy optimization and public safety. To conclude, 5G and the subsequent advances are paving the way for a highly interconnected future. From 6G to AI integration and satellite communication, the future goals have immense promise, recreating the way we live, work and interact with the world around us.

AI in Space Exploration

Stardust-Powered Space Adventure: AI's Cosmic Revolution



~ Aditi Sathe (T.Y.)

We're all made of stardust, and from the dawn of time, space has beckoned us to venture where no one has before. Fueled by an insatiable curiosity to unravel the universe's mysteries, we're fortunate to have a celestial companion in this journey - Artificial Intelligence, or AI for short. This tech wizard is reshaping the landscape of space exploration, propelling us to reach new cosmic frontiers. Join us as we embark on a stellar ride through AI's transformative role in space exploration.

What and Why is AI?

AI, or Artificial Intelligence, is the driving force behind smart machines that mimic human thinking and learning. It's a game-changer in our tech-driven world, automating tasks, deciphering vast data, enhancing decision-making, and boosting efficiency.

In space exploration, AI emerges as the unsung superstar. Beyond futuristic robots, it interprets the overwhelming cosmic data influx.

Space's vastness fuels our curiosity, leading to missions across our solar system and distant galaxies. AI acts as an army of tireless assistants, sifting through data, identifying patterns, uncovering anomalies, and sparking ground-breaking discoveries. It guides spacecraft adjustments, aids rover decisions, and reveals subtle Earth climate changes, all while making space exploration increasingly autonomous, even millions of miles away. AI is the survival instinct of our spacecraft, propelling us into the cosmos.

What NASA is doing with AI:

1. NASA's Kepler Space Telescope, aided by AI, revealed a new planet, Kepler-90i, marking a tie with our solar system for the most planets around a single star. This breakthrough underscores AI's potential in astronomical discovery.
2. AI, particularly machine learning, enhances NASA's Solar Dynamics Observatory (SDO) by providing real-time calibration for precise solar research, space weather prediction, and astronaut safety. It eliminates the need for calibration rocket flights, extending its utility beyond our solar system.

efficiency, autonomy, and reliability, reducing human intervention, and marks a pivotal step toward space communication advancement.

ESA and its AI endeavours:

1. In 2022, ESA's Discovery initiative backed 12 projects aiming to enhance satellite capabilities with AI and advanced computing. These projects, selected through the "Cognitive Cloud Computing in Space" call, aimed to make satellites more responsive, adaptable, and autonomous. They explored various applications, including AI-equipped satellites for disaster management, methane detection, lunar exploration, and rover autonomy.
2. AI's role in processing Earth observation data extends beyond climate change research. With over 700 Earth observation satellites collecting massive daily data, AI, especially machine learning, is vital for extracting valuable information. ESA's Climate Change Initiative uses AI, including convolutional neural networks, to process satellite data on essential climate variables, aiding climate researchers in addressing environmental challenges both on Earth and beyond.

AI at home with ISRO:

1. ISRO uses AI Path Navigation algorithms to send unmanned robots on space missions for critical data collection.
2. ISRO's machine learning model boosts deforestation detection and highlights AI's importance in space exploration. It enhances reporting frequency by scanning imagery for small-scale deforestation, aiding environmental monitoring on Earth and beyond.

AI isn't just a high-tech tool reserved for space scientists in white lab coats; it's becoming an integral part of our collective journey into the cosmos. Think of it as your trusty space travel companion, helping us boldly go where no one has gone before. Whether it's guiding spacecraft through treacherous terrain or deciphering the secrets hidden within vast datasets, artificial intelligence is like that reliable co-pilot, making space exploration more accessible and awe-inspiring. So, as we all look up at the night sky, let's remember that AI isn't just for rocket scientists—it's for all of us, helping to unlock the mysteries of the universe and make space feel a little closer to home.

Asteroid Mining

"In a quest to meet the never-ending demands of humanity, asteroid mining is no longer just a concept; it's becoming a reality in space exploration."

~ Steve Francis (T.Y.)



Asteroid mining, once a futuristic and hypothetical concept is now turning into reality in the field of space exploration thanks to the never-ending demands of humans. Asteroid mining is found lucrative, for mining crystalline water and other required fuels and resources during the entire course of a space mission. Asteroid mining has been a topic in vogue in the past decade in hopes of extracting and using minerals, already on the verge of depletion on Earth, from floating asteroids, which also pose a potential threat of colliding with our planet daily by either disintegrating in our atmosphere or crashing into isolated areas.

Two buzz words, meteoroids, and asteroids, are mentioned regularly by news agencies and media houses. What is the primary difference between them? An asteroid is a large celestial body that can range from a couple of kilometres to several hundred-kilometres in diameter. These are native to the asteroid belt but are found scattered in the solar system. A meteoroid can vary in origin. These can be fragments from a larger asteroid or a rogue planet and range from 10 to 20 meters in size. These are found throughout the Solar System and even in the vicinity of Earth.

Several minerals on Earth are thought to have originated from asteroids and meteoroids that crashed on Earth during its inception. The rogue planet, which led to the formation of the Moon, also transferred some minerals, such as Iron-Nickel alloys (kamacite and taenite) that are commonly found in iron meteoroids. A lot of diamonds in the crust of the Earth have formed as a result of the high pressure, heat, and impact of asteroids. Sulphide, Iridium, Phosphates, and several other exotic minerals originated from them. The platinum group of metals is the trickiest to get on Earth, but not on asteroids. It is sparingly found in countries such as South Africa, Canada, and parts of the US and statistics suggest that just 30 metric tonnes of Rhodium go towards the development of high-end catalytic converters.

With such exciting and crucial minerals in asteroids, scientists wondered why not directly mine essential minerals from them? This thought led to the possibility of asteroid mining.

Several space mining start-ups are seeing a glimmer of hope to start exploration. These startups have already begun designing satellites and robotics for their intended purposes. Several start-ups such as Karman+, Astroforge, and Origin Space have not only aimed to initiate space mining but to also clear space garbage. Astroforge decided to launch its probes, robots, and drills with the help of SpaceX to initiate the mining endeavour, but there has been no significant update on their missions or further developments, but there seems to be hope that they might soon launch their mission towards the end of 2023.

The potential challenges these companies face is that of tracking and analysing the best asteroid for mining as the chances of targeting a flying rock with worthless minerals can be high. Additionally, 95% of the missions will be robotic and remotely controlled which can lead to communication difficulties and power utilisation issues while exploring deep space asteroids. The limit on the amount of material a robot can carry will be affected due to its size, presence of a drilling rig and other equipment, thus making a mission experimental rather than being utility oriented. Government agencies such as NASA also launched missions like OSIRIS-Rex to study and extract minerals.

While asteroid mining is still in its experimental stages it has a promising future. Space mining could become a cornerstone of humanity's spacefaring ambitions which will be in line with the Mars, Moon and other planetary missions.



Organic Electronics and Nano Organic Electronics: Innovation and Sustainability



~ Ananya (F.Y.)

The semiconductor industry has heavily relied on inorganic materials like silicon and gallium arsenide semiconductors, silicon dioxide insulators, and metals for the past forty years. However, as we strive for a more efficient and environmentally conscious society, the need to transition to sustainable alternatives becomes paramount. Silicon, a fundamental material, poses challenges such as limited use in its pure form, high energy requirements for manufacturing, and its non-biodegradable nature leading to toxic e-waste. Therefore, exploring more practical and eco-friendly alternatives is imperative.

In recent times, significant research endeavours have been directed towards advancing the characteristics of organic materials and hybrid combinations (organic-inorganic composites). This emerging field, known as organic electronics or polymer electronics, is at the forefront of interdisciplinary exploration. It revolves around the research and innovation of electronic devices utilizing carbon-based organic materials. Embracing organic electronics, characterized by lower emissions, reduced waste, and improved biodegradability, is a consensus among experts and activists, pointing towards a sustainable future. A renowned polymeric material in this realm is polyaniline, extensively researched for its organic conducting properties, promising advancements in organic components.

The scope of organic electronics is unimaginable; applications would range from electronic implants on organic tissue, similar to a conceptual 'electronic skin', to ultra lightweight computers or even spacecrafts that can be folded like a sheet, and to printable solar cells and flexible automotives. Organic electronics even have the potential to revolutionize healthcare and medicine; think of prosthetic limbs and e-organs. This field is recognized as a multibillion-dollar industry and a key technological enabler for the Internet of Things (IoT).

The extensive scope of this ground-breaking field encompasses all aspects of electronic components, including active devices like Thin Film Transistors (TFTs) and Organic Electrochemical Transistors, as well as passive elements such as resistors, capacitors, inductors, antennas, and interconnects. Additionally, it extends to power-related devices like batteries, photovoltaics (solar panels), and supercapacitors. Already, organic electronic devices like organic light-emitting diodes (OLEDs) have found applications in high-end TVs and smartphones. OLEDs represent a novel approach to illuminating spaces, distinguishing themselves from traditional inorganic LEDs by eliminating the need for point sources like bulbs entirely.

Nano Organic Electronics: The Next Frontier

Researchers are now interested in the practical applications of nanoparticles in this field. The emergence of nano organic devices marks a significant advancement in technology, merging cutting-edge nanotechnology with the versatility of organic materials. Efforts are made to review the important nanoparticles employed as additives to blend with solution-based, organic semiconductors, which would effectively improve performance, reduce energy consumption, enhance functionality and lower costs. The use of nanotechnology allows the electronics to be faster, smaller and more portable. It increases the power of electronic devices, the density of memory chips and helps reduce power consumption. The work done is highly speculative as of yet, but there is extensive promise in the implementation of nanoparticles in high-performance organic electronics device application.

However, this field is still mostly in development and extensive research is required for full actualization of such vast potential. It is understood that contemporary design methods for silicon are largely inadequate for organic electronics. We must expand our understanding of the analogue, digital and mixed signal processing design of various components. Along with which, we must acknowledge the real need for novel and possibly esoteric design methodologies and the co-optimization between circuit design and the other constituents of the supply chain. In conclusion, organic electronics promise flexibility and sustainability, while nano-organic electronics at the nanoscale offer precision and innovation. Together, they revolutionize technology, presenting solutions for diverse industries and environmental challenges, shaping a more sustainable and efficient future.

ATHLETICS

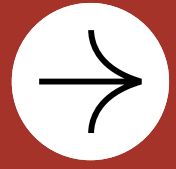


Sports Fest PROTA: A Grand Celebration of Sportsmanship!



"Sports events are the threads that weave together passion, unity and unforgettable moments creating a mosaic of memories that last a lifetime"

"These jerseys not only unified our teams but also stood as a symbol of our spirit and sportsmanship."



~ Priyanka Bansal (T.Y.)

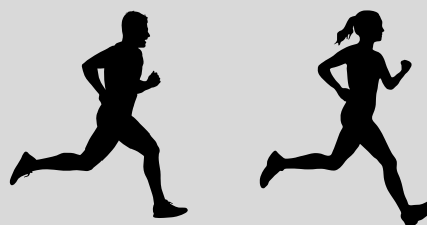
The month of September at our institute, SIT, was nothing short of a whirlwind of excitement and energy. This is because it marked the annual extravaganza of sports and camaraderie - PROTA, the inter-branch sports fest organized by the Sports Council of our institution. The PROTA sports fest brings together students from different branches of SIT to compete in a wide array of sports, fostering a sense of unity and sportsmanship.



This year was no exception as a large number of students from various branches enthusiastically participated in the fest. The festivities commenced with trials to select the best talents, and once the teams were formed, matches were conducted in a spirit of friendly competition. The pleasant September weather added to the joy, creating a perfect atmosphere for sports and fun.

Branch pride ran deep during PROTA, with each branch forming its own teams to compete in various sports. Volleyball, dodgeball, cricket, throw ball - you name it, and teams from different branches clashed in these thrilling competitions. It's not just about winning; it's about showcasing teamwork, sportsmanship, and the sheer joy of playing.

One of the most remarkable aspects of PROTA is its sheer diversity. More than 17 sports are featured in the event each year, ranging from classics like cricket and volleyball to KhoKho and Kabaddi. The festival's motto is clear - there's something for everyone, and participation is highly encouraged.



This year, our branch was well-represented by Avinash Shukla and Ananya Huddar, both from the third year. Their dedication and talent shone through as they competed alongside other branches, carrying the hopes of our branch on their shoulders.



Adding to our pride, two members of the Sports Council, Atul and Anusha, hail from our branch. Their dedication to organizing and managing PROTA speaks volumes about the commitment of our branch members towards promoting sports within our institute.

The icing on the cake was our branch's distinctive white jerseys. These jerseys not only unified our teams but also stood as a symbol of our spirit and sportsmanship. Among the many thrilling moments of PROTA, the tennis finals, dodgeball for girls, and badminton were particularly electrifying. These matches showcased the remarkable talent and dedication of our fellow students, leaving spectators in awe.



But PROTA isn't just about competing; it's also about coming together to cheer for different teams. The atmosphere reverberates with chants and applause as supporters rally behind their respective branches. The cheers and encouragement from the sidelines are just as vital as the action on the field, fostering a sense of unity and belonging.

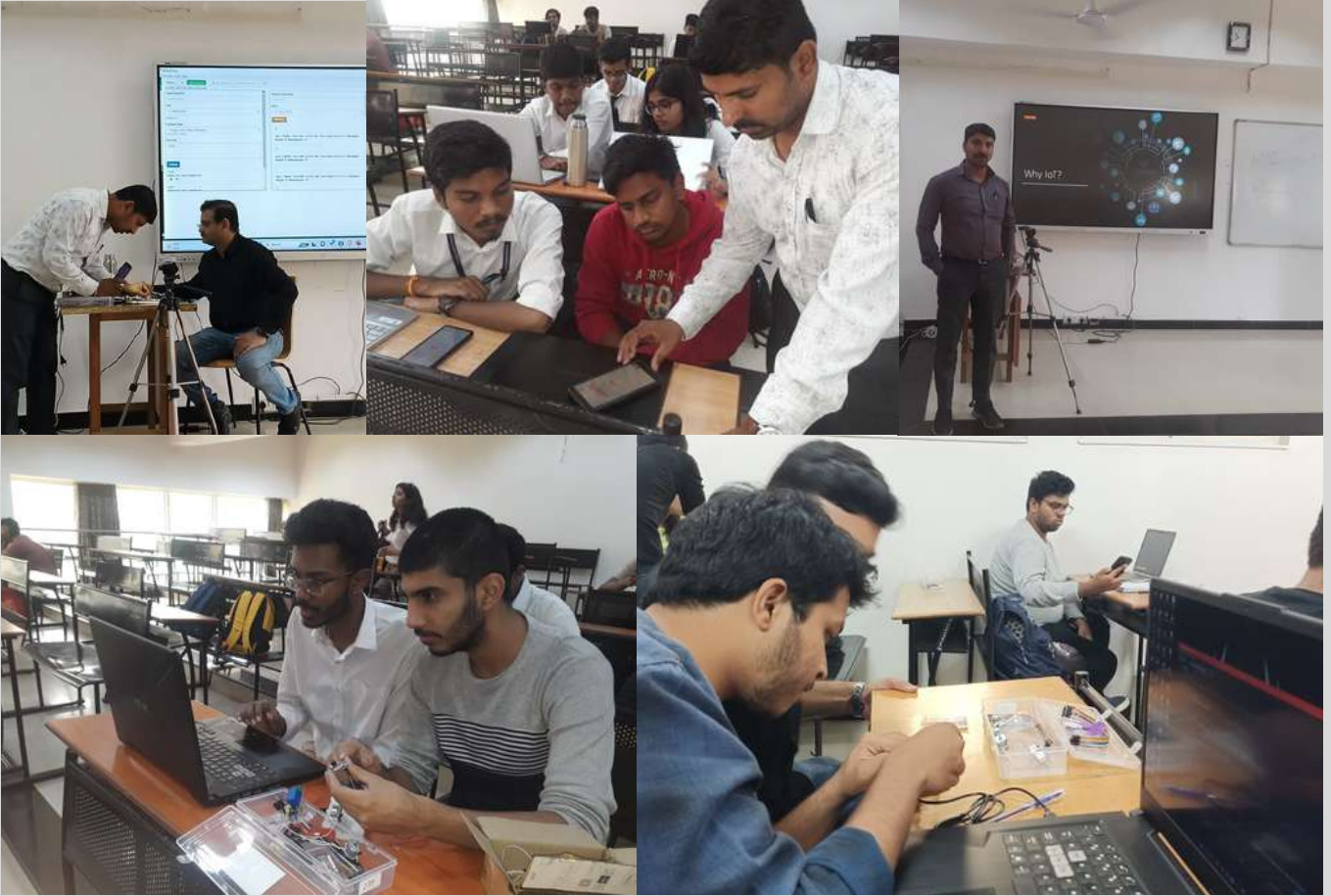
KNOWLEDGE KALEIDOSCOPE



Turning Learning Into a Spectrum of
Possibilities



WORKSHOPS



IoT WS by Coppercloud for TY students



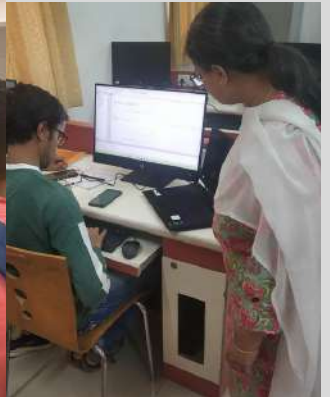
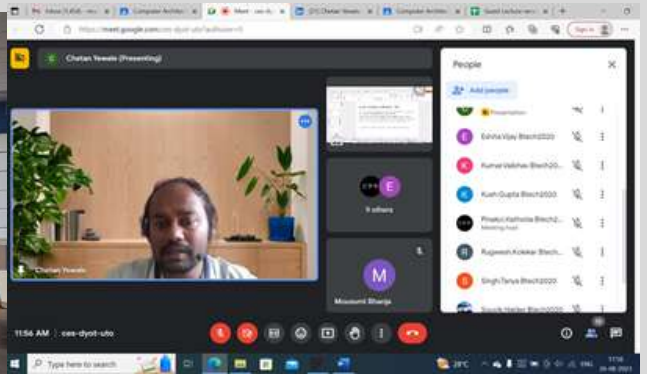
M. Tech Promotion Workshop

WORKSHOPS



AI-Enabled IoT Workshop Diploma Students

SEMINARS



CREATIVE CHRONICLES



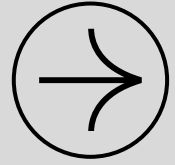
A Spotlight on the Imaginative World



"Creativity knows no age, and within the youthful hearts and minds of our students, we find the seeds of imagination that will shape our future."

Crown

G.S Varsha (T.Y.)



Story of a girl who wanted a crown
Bedazzled and jeweled
Beacause everyone's crowned
selflessly and recklessly gave herself away
became a clown In promise of a crown
Took years but soon realized
The crown that glittered and shined
After all was a crown of thorns

She bled but didn't realize
Was pained but didn't despise
Felt Burdened but would apologise
Wiping away the blood dripping
she smiled away holding
onto this fragile little thing hoping
That It will all pass but
After all it was a crown of thorns

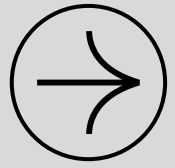
Constantly guilty Constantly rude
Constantly distant Constantly cold
Constantly weary Constantly owed
Constantly judged but Constantly crowned

Years to rip it off her head
As she got up and left
the crown soaked in blood
once desperately wanted
Her wounds bleed and gaped
With eyes that held back tears
bruises and scars on her face
a friend there to embrace
the injured heart that's lighter than ever
After all it was a crown of thorns



A Little Rain for Ease

Anoosha Kanungo (T.Y.)



I don't see romance in rains
somehow,
I'd take an umbrella or not go out.
But tonight, I long for it.
I long for the rain.
I want the soft wind
Like an arm around the shoulder, To
put me at ease
And ruffle through my hair like it
does the leaves;
Make the storm in my chest recede.
I want it to rain, if only a drizzle.
The sky may rattle if it wants to.
Raindrops clapping against earth,
Like emotions on a stony soul.
When I can't let out the pain I feel,
I want the rain to show me.

How's life going? " It's gettin' Real "

Eshita Vijay



At the crossroads of innovation,
where concepts entwine,
A fervent mind seeks horizons to align.
Dreams take wing with logic's tender embrace,
Life's grand tapestry,
a dance filled with grace.

Within halls of discovery,
wisdom's echo hums,
Late-night vigils,
where solutions overcome,
"How's the journey?" a question to explore,
An odyssey unfolding,
emotions to the core.

Equations and prose meld harmoniously,
A symphony of passion,
a life lived joyfully.
Chasing goals akin to shooting stars' gleam,
Life gains vibrancy,
like a waking dream.

Obstacles surmounted,
each challenge a chance,
To rise,
evolve,
in life's intricate dance.
Through nights awake, tests of resilience faced,
I seek to thrive,
with determination encased.

Reality forms, a picture so complete,
Threads of experience woven neat.

I write,
create,
as life paints its hues,
Seeking purpose in moments I choose.



The Visual Chronicles

A Collection of Student's Photography

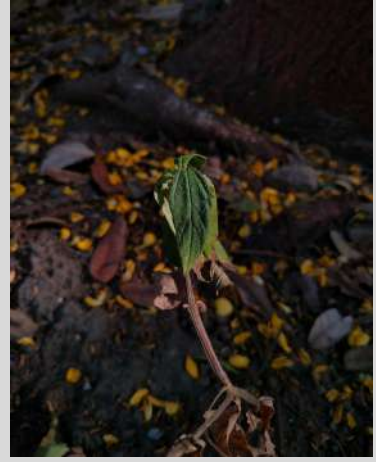
G.S Varsha



Labdhi Mandovara



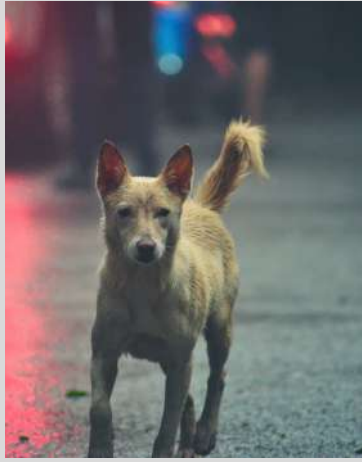
Akshat Soni



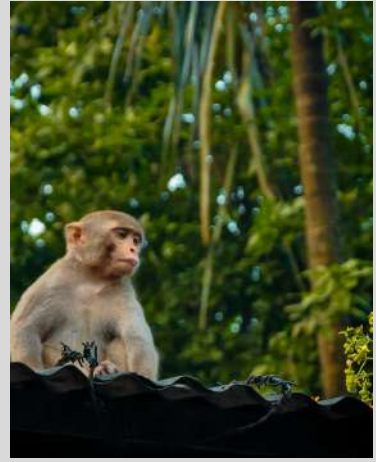
Adrish Purkayastha



Adrish Purkayastha



Adrish Purkayastha



Akshat Soni



Labdhi Mandovara



Akshat Soni



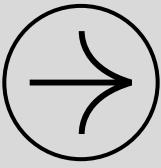
SYMBITECH 2023



EXPLORING INNOVATION, ONE IDEA AT A TIME:

Recapping the electrifying moments of SYMBITECH 2023, where tech innovation and creativity converged for an unforgettable experience





"Reflecting on the remarkable moments of SymbiTech 2023 that once electrified our senses and sparked our imagination. In this article, we transport ourselves back in time to revisit the vibrant atmosphere and groundbreaking innovations of a past techfest, reminiscing about the excitement and inspiration it brought to the world of technology."

TREASURE CIRCUIT-O-RAMA

EVENT COORDINATOR: Dr. Prabhat Thakur

Treasure - O - Rama was a unique and thrilling event that was conducted over the course of two days 20th & 21st September 2023. The team consisted of Team Lead Akshat Soni, and Volunteers, Aditi Naringe, Raghav Sadh, Yaduraj Pawar, Kushal Soni and Tanish Verma. It combined the excitement of a treasure hunt with technical challenges. This event was designed to test the participants' problem-solving skills, teamwork, and technical knowledge in a fast-paced and competitive environment. Teams of two competed against each other, navigating through a series of stages, completing tasks, solving riddles, and ultimately building functional circuits.

Treasure - O - Rama offered an exciting, fun, and a challenging experience for the participants. It combined physical dexterity with technical knowledge, making it a comprehensive competition. The Temple run theme and the coin collection aspect added an adventurous element, and an extra layer of excitement for the participants.

Participants not only had to be quick thinkers and problem solvers but also team players. The combination of games, riddles, technical challenges, and a competitive time limit made Treasure - O - Rama the highlight of the Techfest, guaranteeing participants an unforgettable experience.

The Winning and Runner-Up Teams:

Winners:

Member 1 - Samridhhi Shrivastava

Member 2 - Tanvi Jain

Member 3 - Arshisman

College: SCAC

Runner ups:

Member 1: Raj

Member 2: Aditya

College - SSPU



The Event Team



The Winning Team

WIRED FOR HEIST

EVENT COORDINATOR: Dr. Prabhat Thakur

Event Tech Deets:

Event Duration: 10 minutes

Event Stages: 5

“Wired for the Heist” was an event organized during the Techfest on 20th & 21st September 2023. The event was organized under the Electronic Design Club. The team consisted of Deval Shah, Head EDC Club, Co-Leads, Anushka Sinha and Mansi Kanakamedala, Volunteers, Nandan Divgi, Ayusha Mohanty, Bharath Nair, and Milind Shibli.

The electronics driven event was staged like a Bank Heist. Participants had to solve 5 ciphers (cryptogram), after which they were rewarded with passwords to unlock the gate to the next level. At the completion of the final stage, teams were given access to the vault filled with money and diamond props. If any team ran out of time before solving the final stage, they were arrested and sent to photobooth for mugshots. Ciphers were electronic based which required a prerequisite of basic circuitry and electronics knowledge.



Glimpses of the Event



Behind the Scenes





SYMBITECH AND IEEE



A quick look at what the IEEE Student Branch and the Symbitech Team accomplished, along with the people who made the collaboration an unprecedented success

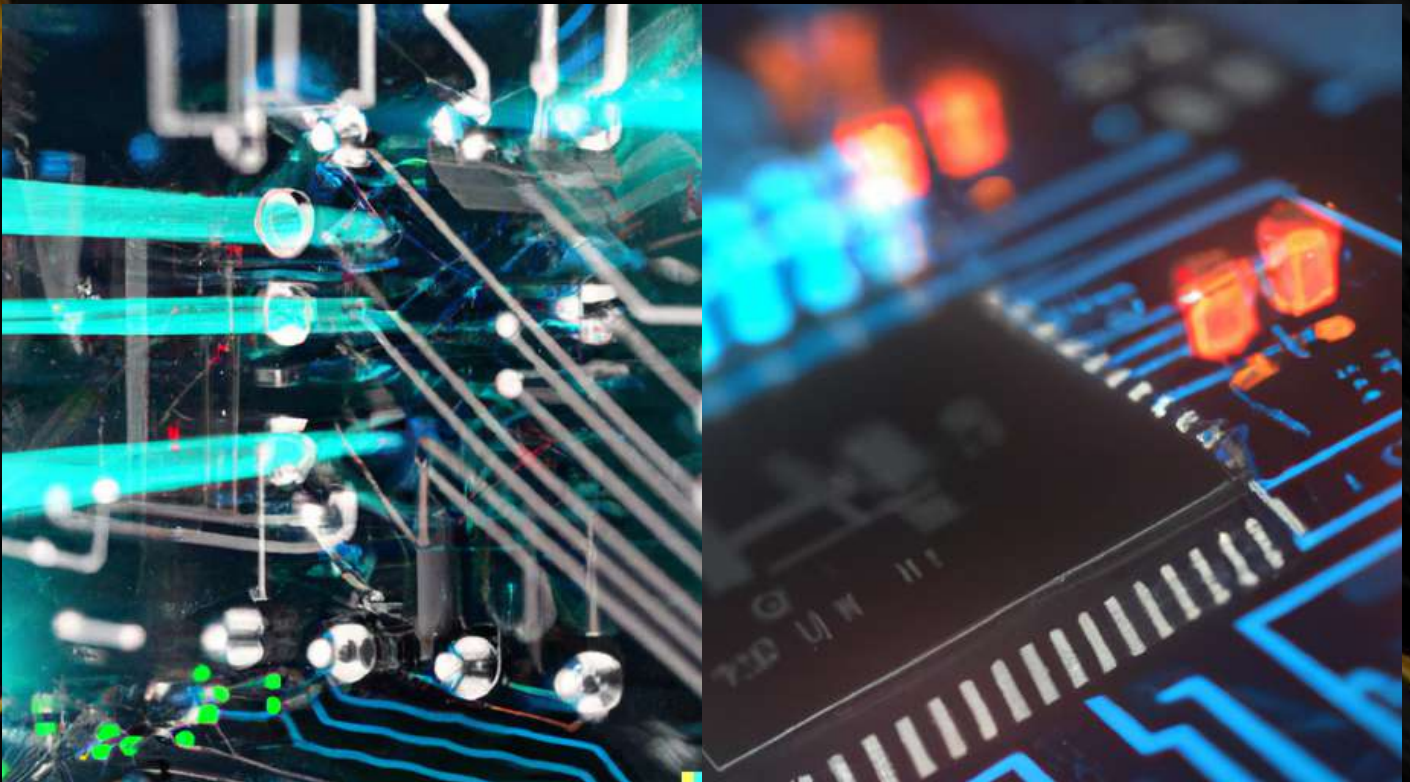
The team who made it all possible



MAKERS' CORNER

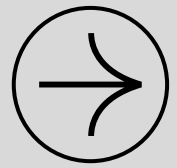


In this section, we proudly present the remarkable projects by the brightest minds. From solving real-world problems to unleashing their creativity, students share their journey, techniques, and insights, inspiring readers to embark on their own paths of hands-on exploration and discovery.



STOCK PRICE PREDICTION OF NIFTY 50 USING DEEP LEARNING MODELS

Ayush Churi, Sahil Agrawal, Aaryan Shakti, Jeetisha Khotale



Because stock prices are dynamic and nonlinear, predicting their movements can be difficult. However, precise predictions can be made by developing an appropriate model with the appropriate variables and parameters. Our method combines sentiment analysis with Natural Language Processing (NLP) including macro and micro factors like global economic conditions, unexpected events, political crises, and companies' financial performance. Using different models like LSTM, Cat Booster, and Random Forest of Deep Learning in the NIFTY 50 dataset of the National Stock Exchange (NSE), the model that provided us with the lowest error was taken into consideration for creating a front-end predictor. The RMSE is evaluated in the models to understand the accuracy of the prediction.

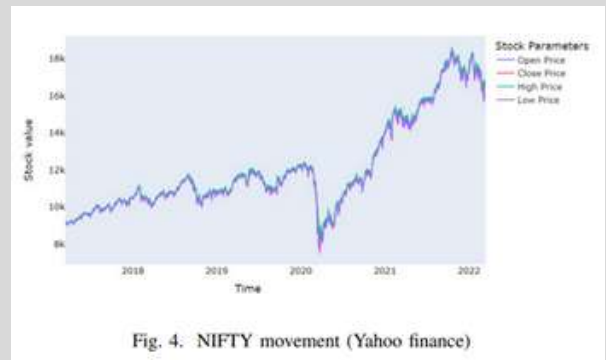


Fig. 4. NIFTY movement (Yahoo finance)

First, we tried different kinds of combinations of the LSTM model with different epochs and batch sizes and layers of neural networks. Using the hit and try method, we tried different kinds of combinations like 100 epoch size batch size 32 8 layers, 100 epoch size batch size 32 6 layers, 100 epoch size batch size 64 4 layers, 150 epoch size batch size 32 6 layers. After applying various hit-and-try methods, the four-layer model with 100 epoch size model is completely optimised, which gave us a mean absolute error of 0.018.

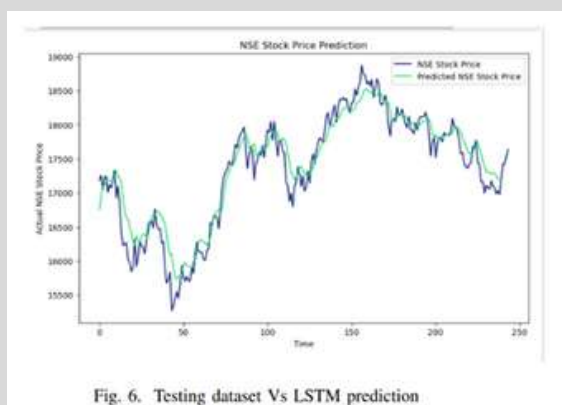
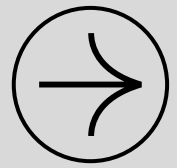


Fig. 6. Testing dataset Vs LSTM prediction

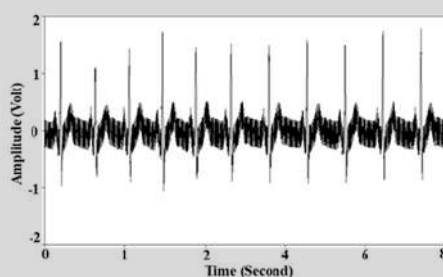
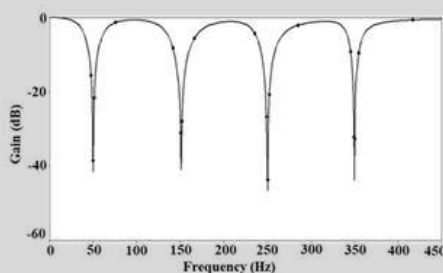
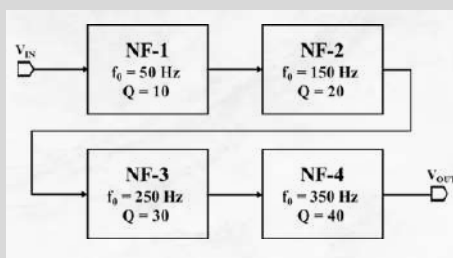
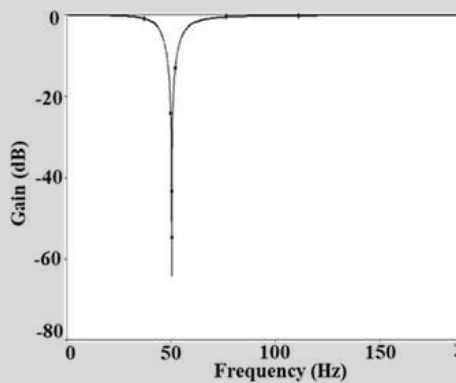
In the new sentiment analysis, first, after proper visualization of the data, we calculated the subjectivity and polarity of the sentiments, which gave us the negative, positive and neutral values of the news which were later applied in the celestial LSTM all this complete setup was in the end applied in the cat booster regression and random forest aggressive. After applying random forest and cat booster regression, we calculated that the root means square error value was 0.016 in CAT booster regression and 0.015 in random forest. The minimum root means square error value was given by random forest regression. Therefore, we consider random forest regression as the final model for prediction.

Our research covers a wide range of industries and uses, offering analysts and investors insightful information. We present a novel approach to stock market analysis by fusing deep learning and sentiment analysis, which may improve forecasting accuracy and facilitate decision-making in a volatile market.

PLI CANCELLATION FROM BIOMEDICAL SIGNALS USING A VDTA-BASED COMB FILTER



Chandan Kumar Choubey, Anoosha Kanungo, Anshika Srivastava, Amit Gupta



The medical field has come to depend on technology more than ever for observing patients, thanks to the detection of biomedical signals from various organs of the body. They are low-frequency signals that require utmost precision in recording, which means that there should be no scope for disturbance in any part of the medical equipment. Yet there are many sources of noise which can contaminate readings and can lead to improper diagnosis, and in turn, treatment of the patient.

In the 4th semester, I began working on a VLSI project under Dr Chandan Kumar Choubey, along with Anshika Srivastava, to combat this. One of these sources is the power line, and it causes a noise of 50 Hz in the read signal. We designed a VDTA-based notch filter to remove the 50 Hz noise. In VDTA – voltage differencing transconductance amplifier- the transconductance element reduces the number of external resistors and, using bias currents, transconductance gain is easy to tune. This makes the VDTA apt for analog signal processing and generation in current mode blocks. Cadence Virtuoso and PSPICE software tools were employed to construct the circuit, and it was tested on the MIT-BIH Arrhythmia database.

Further, on cascading 4 such notch filter together, we obtained a comb filter that could also remove the harmonics of the PLI. The proposed filter was able to remove the main PLI frequency (50 Hz)

and upto three of its odd harmonics (150, 250, 350 Hz). Compared to pre-existing filter designs, this filter halved the number of passive elements in the circuit and reduced the MOS count nearly one-fourth.

We documented this in a research paper titled “PLI Cancellation from Biomedical Signals using a VDTA-based Comb Filter”, which got accepted by the 2023 ASIANCON. I got the chance to present this paper with my mentor in the conference, held at PCCOE in August.



CHANGING LIVES WITH LOVE

- SERVICE LEARNING



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ALUMNI REFLECTIONS



In this section, our esteemed graduates reflect on their unique journeys, sharing the insights, experiences, and life lessons that have paved their path to achievement. Their stories serve as a testament to the enduring impact of our institution and the invaluable contributions of our dedicated educators.

Join us as we delve into the wisdom of those who have thrived and learn from the mentors who have guided them.

Engaging in Alumni sessions can prove valuable to discover previously undiscovered, innovative, and novel career opportunities. Interacting with alumni can help students explore uncharted paths and find a passion that they can follow! Esteemed alumni have conducted guest lectures and seminars to motivate students in diverse fields such as robotics, entrepreneurship ventures, Six Sigma and career opportunities abroad.

Sr. No.	Name of the alumnus/alumna	Designation	Batch	Date of the event	Topic name	Event
1	Mr. Anirudh Srivastava	Co founder and director, Mobketeing Infotech Pvt. Ltd.	2013-17	10th September 2022	Entrepreneurial journey of building an ad tech start-up	Online lecture
2	Mr. Shashwat Bajpai	Senior Associate Software Engineer, Mathworks	2015-19	17th September 2022	Introduction to building desktop apps using app designer	Online lecture
3	Mr. H. Sairaam	Senior Associate, Amazon	2017-21	24th September 2022	Make an effective career path	Online lecture
4	Ms. Niharika Saxena	Officer at CitiCorp Services	2013-17	1st October 2022	5 pointers to level up	Online lecture
5	Mr. Aditya Prakash	Pursuing MS in Robotics, University of New South Wales, Australia	2014-18	8th October 2022	Robotics, learning it & beyond	Online lecture
6	Ms. Saaloni	Certified Prince2 Practitioner	2012-16	15th October 2022	Six Sigma	Online lecture
7	Mr. Pranjul Khanna	Deputy General Manager, Schneider Electric.	2009-13	5th November 2022	Industrial Automation	Online lecture
8	Ms. Seepja Payasi	Software Engineer, Persistent Systems	2018-22	19th November 2022	E&TC to Software Engineering	Online lecture
9	Alumni meet	2018-22 batch students	2018-22	10th December 2022		Offline meet
10	Mr. Mihir Kavishwar	Co founder Dandelion, US	2014-18	Mar-23	Career opportunities abroad	Online lecture



Alumni Lecture Series

Department of Electronics and Telecommunication

TOPIC : Make an Effective Carrier Path

H.Sairaam
Sr.Associate, Amazon
2017 - 2021



24th Sept, 2022
10.00 am, IST

Alumni Lecture Series

Department of Electronics and Telecommunication

TOPIC : 5-Pointers to Level-Up

Niharika Saxena
Officer at CitiCorp Services
E&TC 2013-2017



1st Oct, 2022
10.00 am, IST



Alumni Lecture Series

Department of Electronics and Telecommunication

TOPIC : Robotics, learning it and beyond

Aditya Prakash
Pursuing MS in Robotics
from Univ of New South
Wales, Australia.
E&TC 2014-2018



8th Oct, 2022
10.00 am, IST



Alumni Lecture Series

Department of Electronics and Telecommunication

TOPIC : Six Sigma

Saaroni
2012-2016 batch,
Certified Prince2 Practitioner
Six Sigma green belt
Ex- Bank Of America, Alstom
Indian Institute of Foreign
Trade



15th Oct, 2022
10.00 am, IST



Alumni Lecture Series

Department of Electronics and Telecommunication

TOPIC : Industrial Automation

Pranjul Khanna
2010-2013 batch,
Deputy General Manager
Schneider Electric



5th NOV, 2022
11.00 am- 12.00 pm, IST



Alumni Lecture Series

Department of Electronics and Telecommunication

TOPIC : E&TC to Software Engineering

Seepja Payasi
Batch 2018-22,
Presently working with
Persistent Systems



19th NOV, 2022
10.00 am- 11.00 pm, IST

Mr. Mihir Kavishwar – Online lecture was conducted by Mr. Mihir Kavishwar for the 2020-24 batch students.

Alumni interaction session during the induction program of 2022-26 batch. We had two alumni from the 2016-20 batch Amisha Kuwarbi and Pranshu Verma and one from 2017-21 batch Tanay Agrawal. Amisha is working with Acquia as an associate support Engineer and Pranshu is working with Amazon. Tanay is doing for M.S. from Berlin University, Germany. The first year E&TC students interacted with the alumni and got answers to a lot of queries.



THE TEAM



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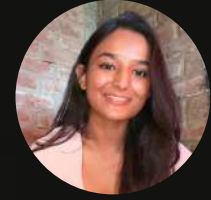
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