GOVERNMENT COLLEGE OF TECHNOLOGY,
COIMBATORE - 13

GCT IEEE SB 81571

BROCHURE

2024-25

"EXPLORE AND EXPERIENCE INNOVATION
IN EVERY PAGES"

IEEE

ABOUT

The GCT IEEE Student Chapter (SB-81571) is committed to fostering a dynamic research environment within GCT by engaging in various technical activities with global industry experts, researchers, and scientists worldwide. This dedication extends to supporting students in their academic publications and facilitating the registration of Intellectual Property (IP). Additionally, the IEEE plays a pivotal role in assisting students by endorsing and supporting cutting-edge global conferences across various technological domains within GCT, providing valuable opportunities for networking and knowledge exchange.

VISION

IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. IEEE envisions global recognition for the transformative contributions of technology and technical professionals, fostering a collaborative ecosystem that transcends boundaries. The organization aspires to be indispensable to the world's technical community, driving positive change through cutting edge research, education, and standards development.

MISSION

GCT IEEE's core purpose is to foster technological innovation, research culture and excellence for the benefit of the students in the Government College of Technology and encourage them to pursue their innate enthusiasm for technology in the study area and publish a paper to IEEE. Our Student Branch should value the following things:

PEOPLE

INNOVATION

COLLABORATION

GOVERNMENT COLLEGE OF TECHNOLOGY - COIMBATORE

IEEE

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Patron's Desk

Dr.K.Manonmani ME.,PhD.,

It is my pleasure to commend the GCT IEEE Student Branch for its commitment to fostering innovation and collaboration among students. Through diverse activities and projects, the branch provides a dynamic platform for learning and growth. I applaud the dedication of its members, mentors, and supporters in shaping the future of technology. Together, let us continue to inspire and empower the next generation of engineers and innovators.

Branch Counselor's Desk

Dr.R.Rajeswari ME.,PhD.,MISTE

As the branch counselor of the GCT IEEE Student Branch, I am continually inspired by the enthusiasm and dedication of our student members. Together, we have fostered a vibrant community that thrives on innovation, collaboration, and excellence in technology. Through various initiatives and events, our student branch has not only enriched the academic experience but has also provided invaluable opportunities for personal and professional growth. I am proud to witness the impactful contributions our members make to the field of engineering and beyond, shaping the future with their passion and commitments.

TIMELINE OF EVENTS

START

- BROCHURE CEREMONY
- AN ICEBREAKER SESSION
- INNOVATIVE WAVE
- SOLAR PAINT TECHNOLOGY
- OPENCV: SEE THE UNSEEN
- RECRUITMENT OF ALL TEAM
- BREAKING BARRIERS
- WEBINAR ON AI
- SKYNET 3.0
- AUTOGENIX
- BOARD INSTALLATION'25

END

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EIE - 2025

VICE - CHAIRPERSON
HARIPREETH D M
ECE - 2026

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SRIDHAR S
EEE - 2025

JOINT TREASURER
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SOLAR LEAD

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ROBOTICS CO-LEAD & WEB MASTER

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TESTIMONIAL

NIRANJAN G
CHAIRMAN
BATCH 2025 (EIE)

"My tenure as Chairman has been a defining period of growth, leadership, and collaboration. Leading a vibrant and motivated team over the past year has given me the opportunity to oversee the strategic direction of our organization, while ensuring that our initiatives were both impactful and student-focused.

This role demanded a high level of responsibility, vision, and adaptability. From planning major events to guiding teams through execution, I had the privilege of working alongside dedicated individuals who constantly strived for excellence. Together, we created platforms for innovation, technical learning, and personal development that truly reflected the spirit of our community.

I am proud to have led an organization that upholds integrity, inclusivity, and a forward-thinking mindset. This experience has not only refined my leadership skills but also deepened my passion for serving and empowering others. I leave this role with a sense of accomplishment and immense gratitude for the support, trust, and shared vision of everyone involved."

SARANYA J
SECRETARY
BATCH 2026 (ECE)

"Serving as the Secretary over the year has been a fulfilling and transformative experience. This role provided me with a platform to enhance my organizational, communication, and leadership skills while contributing meaningfully to the growth of our student body.

Throughout the term, I was responsible for coordinating meetings, maintaining records, and ensuring the smooth execution of various events and initiatives. Collaborating with a dynamic team of board members and volunteers allowed me to gain valuable insights into teamwork, strategic planning, and effective execution.

I am grateful for the trust and support I received during my tenure and proud to have been part of a team that is committed to excellence, innovation, and collaboration. This experience has significantly shaped my confidence, responsibility, and readiness to take on future challenges."

AKSHAYA S
SOCIAL MEDIA HANDLER
BATCH 2026(ECE)

"My tenure as the Social Media Handler of GCT IEEE SB-81571 has been a rewarding phase of strategic communication and creative execution.
In this role, I was responsible for managing our digital presence, curating content, and ensuring consistent engagement across platforms. It offered me the opportunity to align our online identity with the vision and values of the Student Branch.

This experience enhanced my skills in content strategy, branding, and collaborative execution, while also deepening my understanding of audience engagement. I am grateful for the trust placed in me and proud to have contributed to a platform that empowered innovation and community building."

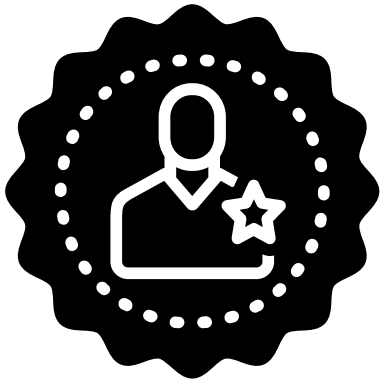
MEMBERSHIP

IEEE is a global organization with a diverse membership spanning across the world. As part of GCT IEEE SB-81571, students have the unique opportunity to engage with a vibrant, multicultural community, gain a global outlook, and collaborate on innovative projects with peers from varied cultural and professional backgrounds.

Membership in IEEE unlocks a wealth of benefits, including unparalleled networking opportunities, access to cutting-edge research and resources, professional development programs, leadership and volunteer roles, and career advancement opportunities. In today's fast-paced, tech-driven world, retaining members is more critical than ever. It ensures a strong, active community, fosters a sense of belonging, and supports IEEE's mission of driving technological innovation and knowledge sharing

At GCT IEEE SB-81571, our members are actively leveraging their memberships to stay ahead in their fields. They gain exclusive access to IEEE's vast repository of publications, research papers, and digital resources, enabling them to stay updated on the latest trends and breakthroughs. This access not only enhances their expertise but also empowers them to contribute to groundbreaking research and innovation within the global tech community.

In an era, where staying informed and connected is key, IEEE membership provides the tools and platforms needed to thrive in a rapidly evolving technological landscape. By embracing these opportunities, members are better equipped to lead, innovate, and make a meaningful impact in their respective fields.



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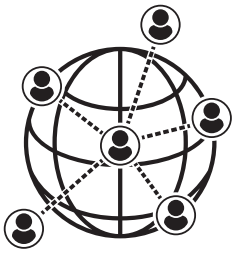
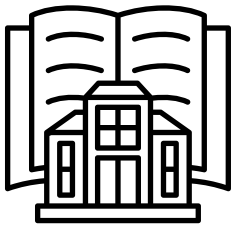
MEMBERSHIP BENEFITS

Connect with professionals, researchers, and peers worldwide.



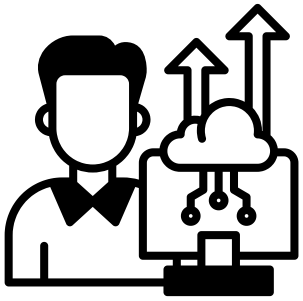
Explore IEEE's vast library of journals, papers, and cutting-edge publications.

Access job boards, mentorship programs, and industry insights.

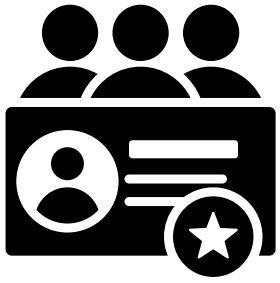


Gain insights into the latest trends and advancements in technology.

Attend workshops, webinars, and certification programs to enhance skills



Enjoy reduced rates on conferences, courses, and IEEE publications.



Take on volunteer roles and lead initiatives to build experience.

Work on global projects and collaborate with diverse teams.

Be part of a global community driving technological progress and innovation.

Showcase your work and gain recognition through IEEE competitions and awards.

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SEMINAR

ICE BREAKERS

August 29, 2024

"The first step toward getting somewhere is to decide that you are not going to stay where you are."
– John Pierpont Morgan

In this engaging session, Sridhar and Ragul introduced the Solar Squad, highlighting its focus on solar energy solutions. Niranjan and Abinav introduced the Robotics Squad, discussing their work on building and programming robots. Meanwhile, Sanjana and Rajesh introduced the IoT Squad, which specializes in smart, connected devices.

The session also featured interactive icebreakers, allowing participants to connect with one another and fostering a sense of community. This interactive start set the tone for future teamwork, creativity, and learning.

- *Abhinav*
- *Rajesh*
- *Sanjana*
- *Niranjan*
- *Sridhar*
- *Ragul*

This session provided participants with a comprehensive overview of the exciting opportunities within these fields, inspiring them to get involved. Additionally, Vivek Poovalingam, a GCT Alumni Executive, emphasized the importance of teamwork and coordination in any successful project, explaining how collaboration and effective communication lead to innovative outcomes and success.

SEMINAR

IOT ON FOCUS: ENHANCING SECURITY AND CONNECTIVITY

September 2, 2024

> "Don't watch the clock; do what it does. Keep going "
> – Sam Levenson

The session served as an exciting gateway to spark curiosity and enhance technical skills. Participants explored how everyday objects become intelligent through embedded systems and IoT. They learned about sensor integration, wireless communication, and cloud storage functionality. The discussion covered how data is securely stored, accessed, and managed online. Emphasis was placed on data privacy and best practices for protecting sensitive information. This provided a strong foundation in modern digital security concepts.

To make learning engaging, the hosts demonstrated website authentication mechanisms. They explained how genuine websites protect credentials while phishing sites steal passwords. Participants saw real-world applications of cybersecurity in everyday browsing. The session also introduced the ESP module, a powerful IoT tool. An interactive Chrome memory game using the ESP module made learning fun. This blend of theory and practice deepened participants' understanding of smart technology.

- Rajesh A
- Sanjana A

SEMINAR

SOLAR PAINT TECHNOLOGY

September 4, 2024

"Innovation is the ability to see change as an opportunity not a threat."
– Steve Jobs

The session covered the topic of solar energy and solar paint technology. The focus was primarily on the innovative technology behind solar paint and its types, including quantum dot, perovskite, and hydrogen-producing solar paint. The leading japanese company in solar technology, Toshiba, was also discussed. The session aimed to highlight recent developments in the solar energy field, with a special focus on futuristic innovations like solar paint technology.

Several attendees participated with great interest and enthusiasm. To further engage the audience, short quizzes on solar technology were conducted, sparking curiosity and excitement among the participants. Attendees showed a keen interest in the subject and actively contributed to the session, making it a remarkable experience. The seminar not only imparted valuable knowledge but also opened up new possibilities for the future of solar technology. It was a successful event that inspired new ideas and perspectives on sustainable energy solutions.

- **Vishal**

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SEMINAR

IEEE PAPER DISCUSSION

September 11,2024

"Research is to see what everybody else has seen, and to think what nobody else has thought." - Albert Szent-Gyorgyi.

The IEEE Paper Discussion Session, held on 11.09.2024 was an interactive and insightful event where students explored research papers under the guidance of the squad leads from the IoT, Solar, and Robotics teams. Juniors were divided into groups, each provided with an IEEE research paper to analyse and discuss.

Following the discussion, students shared their insights, suggested possible improvements, and engaged in a thoughtful exchange of ideas. To encourage active participation, students who contributed well were recognized with a pen as a token of motivation. The session fostered critical thinking and a deeper understanding of research methodologies.

INTRODUCTION TO AI

October 19, 2024

"Artificial intelligence, when used wisely, has the potential to amplify human potential, unlock creativity, and solve some of the world's most pressing challenges." — Fei-Fei Li

Presented by Mukil Saravanan, Chairman of the Founder Board, the online session provided 40 participants with a strong foundation in machine learning (ML) principles and applications. The webinar covered supervised, unsupervised, and reinforcement learning, along with key algorithms like linear and logistic regression. Topics such as feature extraction, loss optimization, and gradient descent were also discussed, helping attendees understand the core of modern ML systems.

The session also introduced deep learning concepts, including CNNs, RNNs, and their applications in image recognition, sequence modeling, and generative AI. Participants explored transfer learning and foundation models, highlighting ML's role in healthcare, finance, and autonomous systems. With an engaging delivery and interactive discussions, the webinar successfully decoded ML concepts and inspired attendees to explore its vast potential.

- **Mukil Saravanan**

IOT SQUAD

"Individually we are one drop, but together we are an ocean of innovation."

We, the IoT Squad, are a passionate group committed to exploring the limitless potential of the Internet of Things. Our platform enables students to engage in research, hands-on projects, and industrial collaborations, enhancing their technical skills while solving real-world challenges. We aim to build a community of innovators equipped with creativity and leadership to shape the future of IoT.

Perseverance and dedication:

Our success is a result of the unwavering dedication and tireless efforts of our squad members. We consistently indulge ourselves towards the knowledge aspiration by commencing various group discussions, practising software simulations for doing several mini project ideas.

. One significant project, the Orthotic Leg, analyses walking patterns to assist in rehabilitation. It helps track mobility improvements for individuals using support aids. We had the opportunity to present our prototype to the Honourable Deputy Chief Minister, Mr. Udhayanidhi Stalin, and other officials. This experience motivated us to work on more impactful IoT solutions.

Empowerment via knowledge:

We have organized and conducted seminars aimed at expanding knowledge and fostering skills among students. These initiatives have proven to be beneficial for all participants, offering hands-on learning, skill development and industry insights. Several effective sessions were conducted by our members including Introduction to the Microprocessors and Microcontrollers, Cryptography in Cybersecurity and Wi-fi networking. Together, we are not just exploring technology—we are creating it.

Recruitment Hierarchy:

Our IoT Squad recruitment was conducted in three phases to select the most qualified candidates. In Phase 1, 40 participants were assessed on their IoT knowledge, and 20 advanced to the next stage. Phase 2 involved hands-on mini projects using software simulations, testing their ability to design, implement, and troubleshoot IoT systems. Finally, in Phase 3, shortlisted candidates underwent interviews where both technical and non-technical skills were evaluated. Based on their expertise, creativity, and communication skills, 10 outstanding individuals were selected to join our squad.

FACTS

There are over 18.8 billion connected IoT devices worldwide. An average person uses 8-12 IoT devices a day.

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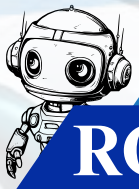

ROBOTICS SQUAD

"We're fascinated with robots because they are reflections of ourselves."

We, the Robotics Squad of GCT IEEE, are a team that embodies innovation and invention. We work in the realm of robotics, striving for a brighter and more delightful future. Our aim is to promote creativity, excellence, and self-sufficiency among people. "Innovation is the art of turning an idea into reality," and we are the artists shaping the future through our ideas and innovations.

Perseverance and dedication:

Our team believes that "skills speak louder than knowledge." We refine our skills by exploring and practicing new technologies in the field of robotics. We also participate in e-Yantra, an annual competition organized by IIT Bombay. This year, one of our teams ranked in the top 50 for hardware-based solutions and in the top 20 for software-based solutions.

Recruitment Hierarchy:

We recruit members based on their technical skills and creative thinking. During the recruitment process for our squad 2024, we conducted two rounds to assess their mental abilities and finalized the members based on their performance in interviews with our leads. Ultimately, out of 60 participants, 9 members were welcomed into our robotics realm.

Empowerment via knowledge:

Sharing knowledge makes us wiser than just learning. We disseminate our ideas and thoughts through sessions and webinars. These sessions serve as stepping stones for development. In our sessions, we cover topics such as ROS, GitHub, MATLAB, OpenCV, Leetcode, and more.

FACTS

Da Vinci,a surgical robot is used in 1,700 hospitals and treated more than 775,000 patients worldwide.

SOLAR SQUAD

"Empowering minds, harnessing solar energy, innovating for a sustainable future."

The Solar Team is a dynamic initiative under the GCT IEEE SB-81571, uniting passionate individuals committed to shaping a brighter and more sustainable future. This team serves as a powerhouse of innovation and knowledge-sharing, dedicated to making meaningful contributions to the renewable energy sector.

Recruitment Hierarchy:

Each year, the Solar Team selects talented individuals through a rigorous process involving tests and presentations. This year, 107 applicants participated, with 36 shortlisted for interviews, and the final 10 members selected based on their performance. Their fresh ideas and dedication drive impactful projects in renewable energy, ensuring continuous innovation and collaboration toward a sustainable future.

Empowerment via knowledge:

The Solar Team aims to equip its members with practical knowledge and technical expertise in solar energy systems. Senior members lead engaging sessions that provide hands-on learning experiences, teaching the fundamentals of solar panel technology and their working mechanisms. These sessions are not limited to theoretical learning; they create opportunities for brainstorming, where members share ideas and collaborate to tackle real-world challenges. By analysing practical problems and generating innovative solutions, the team fosters a culture of critical thinking and creative problem-solving. Through this interactive approach, members not only learn but also gain confidence in applying their knowledge to solve real-life energy issues effectively.

FACTS

Amount of solar energy the Earth receives in 90 minutes from Sun, could power the world for a year.

IEEE

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SKYNET 3.0

“The best way to predict the future is to invent it.”

SKYNET 3.0, an intra-college hackathon organized by GCT IEEE SB-81571, was designed to ignite innovation and problem-solving skills among students. With a prize pool of ₹12,000, this hackathon provided a platform for students to collaborate, ideate, and bring their technical ideas to life. Conducted in three phases, SKYNET 3.0 challenged participants to think beyond conventional solutions and develop impactful projects that address real-world problems.

Phase 1: Idea Submission and Shortlisting

The first phase of SKYNET 3.0 saw an overwhelming response from 40 teams, who registered with their innovative ideas. Participants were given seven predefined themes along with an open theme, allowing them the flexibility to explore and propose solutions beyond the given categories. This phase tested their ability to identify problems, articulate their ideas effectively. After a thorough review of the abstracts, 20 teams were shortlisted for the next stage based on the novelty, feasibility, and impact of their ideas.

Phase 2: Project Presentation and Evaluation

Held on November 11, 2024, was an intensive presentation round where the shortlisted teams presented their projects through detailed PowerPoint presentations. A distinguished panel of three jury members evaluated the teams:

- **Mr. Angappa Velumani, an alumnus of the 2006 EEE batch and founder of Megatech Scientific Instruments and SPAARK Technologies, who provided valuable insights into real-world applications.**
- **Dr. A. Anitha, Associate Professor in ECE with expertise in Medical Electronics, who guided participants on research perspectives and technological advancements.**
- **Mr. S. Dhodraj, a software engineer and an alumnus of the 2022 Electronics and Instrumentation batch, who shared knowledge on AI, software innovation, and critical thinking.**

Their constructive feedback and expertise helped participants refine their concepts and enhance their project ideas. At the end of this phase, eight teams were selected based on their project's feasibility, innovation, and potential impact.

Phase 3: Prototype Development and Demonstration

The final phase of SKYNET 3.0 was successfully conducted on February 15, 2025, where the top eight teams presented their working prototypes to an audience of over 40 attendees. The event was graced by the presence of:

- **Dr. Kalaiarasi Arumugam, IEEE Senior Member and IEEE Humanitarian Technologies Board - Events Committee Board Member, who is also an esteemed alumnus of GCT.**
- **Dr. J. Arun Baskaran, from the Department of Industrial Biotechnology, who evaluated the projects and provided valuable guidance.**

The teams demonstrated their technical solutions, problem-solving approaches, and execution strategies in front of the jury and audience. The event was a testament to creativity, innovation, and technical proficiency, highlighting the potential of young minds in addressing complex challenges.

Achievements and Impact

SKYNET 3.0 served as a transformative experience for participants, equipping them with practical problem-solving skills, technical expertise, and teamwork abilities. The event encouraged students to push their limits, gain exposure to industry insights, and refine their project development process. The hackathon fostered a culture of learning and collaboration, inspiring participants to continue exploring new technological advancements.

Gratitude and Acknowledgment

SKYNET 3.0 would not have been possible without the continuous support and guidance of our faculty and organizers. We extend our deepest gratitude to Dr. K. Manonmani, Principal of GCT, for approving the Student Development Fund, which provided essential resources to make this event a success. A special appreciation to Dr. R. Rajeswari, IEEE GCT Branch Counselor, for her unwavering support and guidance in securing the fund, ensuring that every stage of the hackathon was executed smoothly.

A heartfelt thank you to our respected jury members for sharing their valuable time, knowledge, and insights, making this event a meaningful learning experience. Lastly, we appreciate the efforts of our faculty members, volunteers, and participants, whose contributions made SKYNET 3.0 an unforgettable and impactful event.

We also acknowledge the tireless efforts of our IEEE SB executives, who played a crucial role in securing the necessary resources and facilitating the event's success. Their dedication to fostering student innovation and growth has been truly commendable.

WINNERS

After careful evaluation, the winners of SKYNET 3.0 were:

TEAM - TECH SPARKERS

Manish E

Harishkannan R

Jeremiah Reuban N

TEAM - INNOVATERS

Sowndhar P

Vishwa T

TEAM - BRAINIACS

Lokeshwar S

Sriram S

Vijayavarshini M

Varshni S

"Congratulations to all the winners and participants for their hard work and dedication throughout the competition."

AUTOGENIX

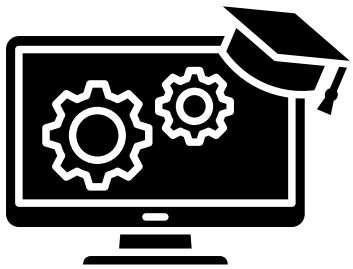
"Where Technology Meets Transformation"

GCT IEEE SB-81571 successfully organized AutoGenix, a two-day hands-on workshop on Industrial Automation, held on February 18-19, 2025. This workshop was designed to provide participants with practical knowledge of automation technologies, equipping them with the necessary skills to navigate the evolving landscape of industrial automation. The workshop featured interactive sessions, hands-on training, and expert insights to bridge the gap between theory and real-world applications.

Workshop Speaker

The sessions were led by Mr. Angappa V, a renowned expert in industrial automation, Founder of Megatech Scientific Instruments & Spaark Technologies, Professor of Practice in the EEE Department at Sri Eshwar College, and a proud alumnus of GCT. With vast expertise in automation and embedded systems, he provided invaluable insights into the field, sharing real-world applications and guiding participants through practical implementations.

His dynamic and interactive teaching approach ensured that students grasped complex automation concepts with ease. Through engaging demonstrations and industry-oriented discussions, he encouraged participants to think critically and explore innovative solution



Workshop Overview

AutoGenix was structured to offer an immersive learning experience, with a focus on both foundational and advanced automation concepts. Participants had the opportunity to work with cutting-edge software tools, gain exposure to industrial automation technologies, and understand how these concepts are applied in real-world scenarios.

With over 200 participants from various institutions, the event was a testament to the growing interest in automation technologies and their role in modern industries.

Day 1: Introduction to Automation & Hands-on Learning

The first day of the workshop focused on fundamental concepts in industrial automation, including:

- **Introduction to Industrial Automation** – Understanding the significance of automation in modern industries.
- **Automation Systems & Control Mechanisms** – Overview of control systems, sensors, and actuators.
- **Industry Trends & Applications** – Real-world examples of automation in manufacturing and process industries.

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Day 2: Automation & Real-World Applications

The second day continued with a deeper understanding of automation concepts and their applications. Mr. Angappa V guided participants through:

- **Basics of Control Systems & PLC Programming** – Understanding programmable logic controllers (PLCs) and their role in automation.
- **Simulation-Based Circuit Design** – Exploring automation concepts through circuit simulations.
- **CECO Client & HMI** – Introduction to Human-Machine Interface (HMI) and working with CECO Client.

After the theoretical session, hands-on training commenced, introducing participants to circuit simulation and automation exercises using industry-standard tools. Participants gained practical experience with TINA, an industrial-standard tool for circuit simulation, and CADe, which further enhanced their understanding of automation systems. These tools provided an interactive learning experience, allowing participants to engage in real-time problem-solving and software-based circuit design

Participants implemented block diagram logic and ladder logic in CECO Client, reinforcing their learning. The session encouraged active discussions, troubleshooting real-time issues, and collaboration, allowing participants to exchange ideas and enhance their skills using industry tools.

Tools learnt in AutoGenix

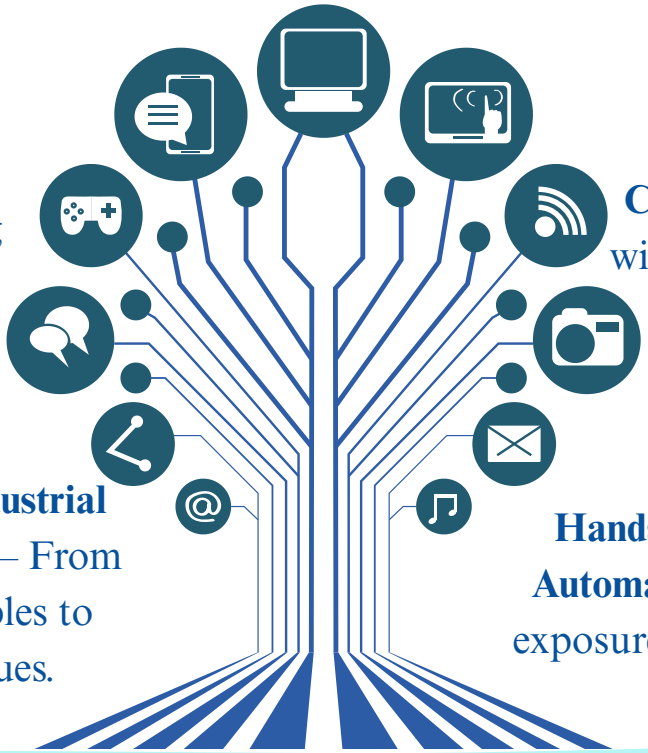
Throughout the two-day workshop, participants gained hands-on experience with various automation tools, including:

- **TINA – A powerful circuit simulation tool for electronic design, enabling real-time analysis and testing.**
- **CECO – A software platform used for control system modelling and automation simulations.**
- **SimulIDE – An open-source simulation tool for embedded systems, offering real-time debugging capabilities.**
- **CADe– A specialized tool for circuit design and automation workflows, used in industrial applications.**

Key Takeaways from AutoGenix

Exposure to Real-World Applications– Learning through case studies and simulations.

Industry-Relevant Skill Development– Equipping participants withessential automation skills.



Networking & Collaboration – Engaging with like-minded peers and enthusiastic students in this field.

Understanding of Industrial Automation Concepts – From fundamental principles to advanced techniques.

Hands-on Experience with Automation Tools– Practical exposure to industry-standard software.

CONCLUSION

AutoGenix, successfully bridged the gap between theory and practice, providing a comprehensive learning experience in industrial automation. The enthusiastic response from participants underscored the growing interest in automation technologies.

GCT IEEE SB-81571 sincerely thanks Mr. Angappa V and all participants for making AutoGenix a success.

BROCHURE CEREMONY

21.02.2024

“A well designed brochure is like a piece of art that tells a story.”

The brochure unveiling event, held on February 21, 2024, marked a significant milestone for GCT IEEE SB-81571. The event was graced by the presence of esteemed alumnus Mr. Vignesh Radhakrishnan (EIE-2015), Lead Consultant at ThoughtWorks, along with Mrs. Yogalakshmi, who shared valuable insights on industry trends and innovation. His experiences and guidance motivated students to strive for excellence in their professional journeys.

The event concluded with the official unveiling of the brochure, reflecting the club’s journey and achievements of the tenure 2023-2024. Under the guidance of Mr. Suntrakanesh Subramanian, the event successfully inspired collaboration, leadership, and technical growth among IEEE SB-81571 members.

ACHIEVEMENTS

A LEGACY OF EXCELLENCE IN IOT, ROBOTICS, AND SOLAR INNOVATION

The IEEE Student Branch of Government College of Technology (GCT) has consistently excelled in fostering technological innovation and advancing solutions in IoT, robotics, and solar technologies. Here are some of our significant achievements:

Achievements of IoT Squad

The IoT Squad has achieved groundbreaking advancements in assistive technology, transforming mobility for individuals with lower limb impairments.

ORTHOTICS LEGS

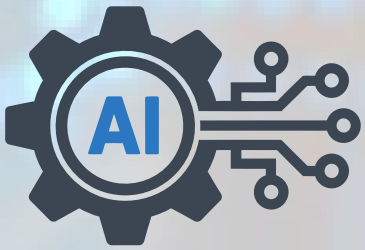
Integration of IoT Technology: Developed smart **Orthotics legs** capable of real-time connectivity with healthcare professionals, enabling personalized care and remote monitoring.

Advanced Sensor Utilization:

The Incorporated IMU sensors for precise kinematic data analysis, enhancing gait performance and biomechanical assessments.

Enhanced User Experience:

Designed intuitive interfaces for seamless customization, feedback, and control.



AI-Powered Adaptations:

Implemented artificial intelligence and powered actuators to dynamically support users' strength and endurance.

Improved Accessibility:

Enabled remote communication with healthcare providers, reducing the need for frequent in-person visits and offering greater independence to users.

These innovations exemplify IoT Squad's commitment to improving lives through technology, fostering independence, mobility, and well-being for countless individuals.

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Achievements of Robotics squad

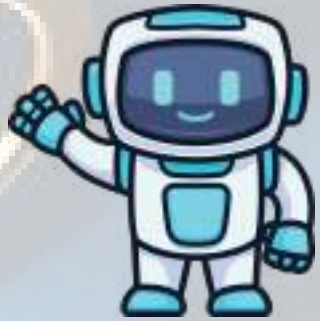
The robotics squad showcased their remarkable talent and dedication by participating in the prestigious e-Yantra competition as two distinct teams. Their innovative projects and collaborative efforts highlighted their technical skills and creative problem-solving abilities.

Team 1: **EcoMender Bot**

This team focused on developing the EcoMender Bot, a solution-driven project aimed at promoting sustainability and eco-friendly practices.

Team Members:

Abinav K(Mentor)	**EIE BATCH 2025**
Elakkiya R	**IT BATCH 2026**
Minusri B	**EIE BATCH 2026**
Haripreeth DM	**ECE BATCH 2026**
Jenet Stacey P	**EIE BATCH 2026**



Team 2: **Warehouse Drone**

The second team worked on an advanced **Warehouse Drone** project designed to streamline warehouse operations with automation and efficiency.

Team Members:

Venkatesa Perumal R	**CSE BATCH 2025**
Karthiga M.	**ECE BATCH 2026**
Sundari K.	**CSE BATCH 2025**
Visalini K.	**CSE BATCH 2025**

Both teams displayed exceptional dedication and teamwork throughout the competition. Their participation was invaluable, as they effectively applied their knowledge and skills to address real-world challenges.

Ambassador for IEEEXtreme 18.0

Mr. Rajesh A (EIE BATCH 25) has been selected as an Ambassador for **IEEE Xtreme18.0**, the prestigious global coding competition hosted by **IEEE**. This remarkable achievement not only highlights his exceptional skills but also his dedication to fostering innovation and collaboration in the tech community.

INDIVIDUAL ACHIEVEMENTS

Mohammed Yassir I (ECE BATCH 2026), as a part of the dynamic squad "Techy Freakz," showcased exceptional skills and innovation at the IoT Hackathon held under the Naan Mudhalvan Program on 17th October 2024 at Suguna College of Engineering, Coimbatore. Competing against talented participants, the team secured 2nd place with their outstanding project. This achievement highlights their technical expertise and knowledge.

Manish E and **Lokeshwar S**, EEE BATCH 2026 students, displayed remarkable innovation and technical prowess by securing 1st place in the Mini Project Competition conducted by the IEEE Student Branch of SKCT (SB13131) on 30th August 2024. Their project, titled "Automated Bus Ticketing" demonstrated an ingenious approach to enhancing public transportation efficiency and convenience through automation.

Kamalesh E, **Abilash C**, and **Jai Alwin M** secured 1st place in Research Innovation Launchpad at iDEATHON 2024, organized by IIT Ropar - AWaDH as part of SAMRIDHI 4.0. Their project, Stubble Burning Monitoring and Management System, focuses on addressing agricultural waste challenges while promoting sustainable practices. This recognition highlights their creativity in tackling real-world problems.

Club collaboration

"Coming together is a beginning, staying together is progress, and working together is success." — Henry Ford

"Breaking Barriers", organized by GCT IEEE SB-81571 in collaboration with the Coding Club of GCT, was an impactful event conducted on October 17th, 2024.

SANJAY S (IT-2025) and THANMUGHIL (IT-2025) kickstarted the session with an engaging introduction that highlighted advancements in artificial intelligence, its potential to transform industries, and technical benefits such as leveraging machine learning algorithms for predictive analytics and addressing real-world challenges with innovative solutions.

The session, focused on the "AI Revolution", helped not only Skynet participants in selecting hackathon problem statements but also benefited the students who attended by enhancing their understanding of AI and its real-world applications. This collaborative effort emphasized teamwork and innovation, preparing everyone to tackle AI-driven challenges.

Alumni support

Mr. Vivek Poovalingam, a respected alumnus, **graced the Icebreaker session**, held on 29/08/2024 by **GCT IEEE SB-81571**, with his inspiring presence. The **Icebreaker session** aimed to introduce the club and its three squads—IoT, Solar, and Robotics to over 80 enthusiastic students. The squad leads shared their contributions, activities, and future plans, giving students an overview of the club's vision. **Mr. Vivek Poovalingam's** presence added immense value to the event, motivating the students with his insights and fostering a spirit of innovation. The session ended with the game **"Connections," making it memorable.**

On 11/11/2024, Mr. V. Angappa Velumani and Mr. S. Dhodraj S graced Skynet 3.0 - Phase II as distinguished jury members.

Angappa Velumani, an esteemed alumnus of the **Government College of Technology (GCT), Coimbatore**, from the **2006 Electrical and Electronics Engineering (EEE) batch,** is the Founder of Spaark Technologies. With extensive experience in industrial automation, he has been instrumental in bridging the gap between academia and industry. He served as a jury panelist for **Skynet 3.0 Phase II**, offering valuable insights and assessments. Additionally, he conducted a two-day workshop, **"Autogenix"** on industrial automation, equipping students with practical knowledge.

Dhodraj S, a distinguished graduate of the **Government College of Technology (GCT), Coimbatore,** is skilled software engineer with a strong background in **AI and machine learning.** He served as a jury panelist for **Skynet 3.0 Phase II**, where he provided valuable insights and evaluations. With expertise in software development and AI-driven solutions, he has contributed significantly to the tech industry. His involvement in mentoring and guiding students reflects his dedication to fostering innovation and technical excellence.

On **15/02/2025**, **Dr. Kalaiarasi Arumugam,** an esteemed alumna of the **Government College of Technology (GCT), Coimbatore,** has made significant contributions to engineering and research. She has served as the **Deputy Director at Sri Shakthi Institute of Engineering and Technology** and is a **Senior Member of IEEE**. She actively contributes to the IEEE Humanitarian Technologies Board - Events Committee. She also graced GCT IEEE as a jury panelist for Skynet 3.0 Phase III, providing valuable insights and assessments. Her dedication to advancing engineering education and humanitarian technological initiatives continues to inspire students and professionals alike.

On 21/02/2024 **Vignesh Radhakrishnan, Lead Consultant at ThoughtWorks,** honored the **Government College of Technology (GCT), Coimbatore,** as the **chief guest for the brochure ceremony**. An **alumnus of GCT,** he played a key role as the **Event Manager for TEDxGCT in 2014**. With over eight years of experience in the technology sector, he has contributed to renowned companies like Texas Instruments and Zoho. At **ThoughtWorks**, he specializes in software development and consulting, bringing innovative solutions to the industry. Beyond his professional journey, he actively shares knowledge on social media, offering valuable insights on technology and career growth.

Suntrakanesh Subramanian, a distinguished alumnus of the **Government College of Technology (GCT), Coimbatore,** served as the **past Chairperson of the IEEE Student Branch (SB-81571).** With a strong background in technology and leadership, he played a key role in driving **IEEE initiatives at GCT**. His continued guidance and mentorship have been instrumental in shaping the club's growth, inspiring students to excel in technical and professional domains. Through his valuable insights, he continues to support and empower the next generation of engineers.

Athignegamuthu S, a notable alumnus of the **Government College of Technology (GCT), Coimbatore,** served as the **past Vice Chair of the IEEE Student Branch (SB-81571).** He has been an integral part of the **IEEE community**, providing valuable insights and guidance to the club. With expertise in technology and innovation, he actively supports and mentor students, helping them navigate their technical and professional journeys. His contributions have played a key role in strengthening the student branch and fostering a **culture of learning and collaboration.**

ARTICLE

SIMPLE IOT ARCHITECTURE FOR REAL-TIME DATA PROCESSING

INTRODUCTION

The Internet of Things (IoT) is transforming the way we interact with devices, enabling real-time monitoring and control of physical systems. In this article, I will describe a simple yet effective IoT architecture that I have built. This architecture follows a structured pipeline where sensor data is collected, transmitted to a central MQTT broker, processed by a backend application, and then stored in a database. The processed data is subsequently used for analytics and displayed on frontend applications for user interaction.

DATA COLLECTION AND TRANSMISSION

The core part of this system is a microcontroller connected with sensors that monitor different parameters. These can include temperature, humidity, or even pressure. Microcontrollers read all the data, prepare it to be sent across, and this is done very efficiently and without much weight via MQTT, an MQ Telemetry Transport messaging protocol.

One good reason for its use in IoT applications is due to its lower bandwidth usage. It uses the publish-subscribe model. It acts as a microcontroller, being an MQTT client, and publishes the sensor data onto an MQTT broker running on the EC2 instance. This runs in the cloud and is also the Mosquitto MQTT broker, which can be considered to be the core messaging hub for the system.

MESSAGE PROCESSING AND DATA STORAGE

As the data from sensors comes to the MQTT broker, a backend application processes, analyzes, and stores that in a structured format. For creating the backend application, there may be one used like the Flask or Django framework along with it, also providing a RESTful API in order to access the backend in an efficient manner; the stored data is managed and kept in relational databases like PostgreSQL and MySQL.

The data is persisted in a database, which will allow for historical analysis. The schema of the database is also designed to efficiently handle time-series data, thereby allowing quick retrieval and visualization. In addition, the backend application also ensures validation and filtering of data before it is stored, thus maintaining the integrity of data.

ANALYTICS AND MACHINE LEARNING INTEGRATION

The most important feature of this IoT architecture is the ability to collect meaningful insights from the data. The backend application acts as a bridge between raw sensor data and analytics tools.

ML models are integrated into the system to analyze historical patterns, predict trends, and detect anomalies in real-time.

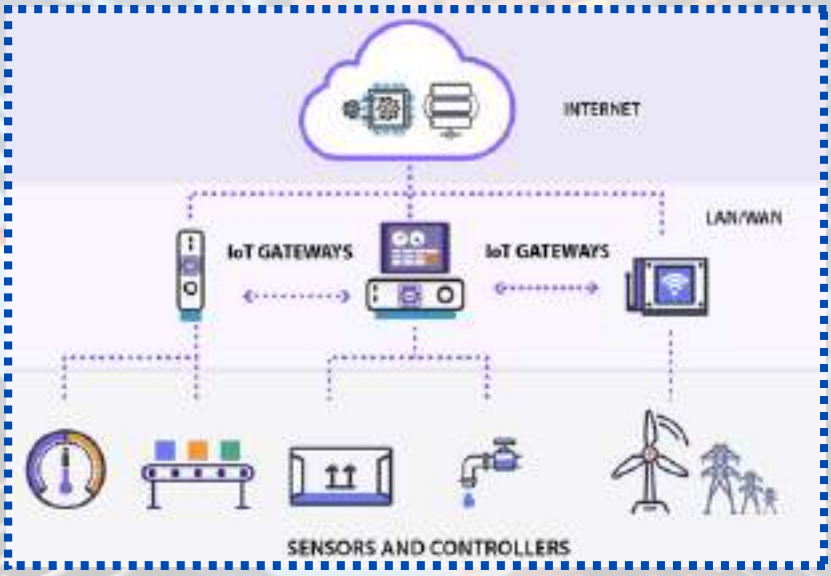
For example, if the system is monitoring environmental conditions, an ML model can identify unusual temperature fluctuations that might indicate a fault in a machine or an upcoming weather anomaly. The insights generated from these models are crucial in decision-making processes and proactive maintenance strategies.

DATA VISUALIZATION AND USER INTERACTION

Once the data is processed and analyzed, it needs to be presented to the user in an intuitive way. The frontend or mobile application fetches relevant data from the backend and displays it in real time. To achieve real-time updates, WebSocket are used for continuous data streaming. The backend sends processed data to the frontend through a WebSocket connection, and this way, users will always have instant updates without refreshing the application. This approach makes the system efficient for monitoring and decision-making based on live data.

SOME KEY FEATURES OF THE FRONTEND:

- **Live data streaming: Real-time sensor data is updated, keeping the user in touch with the latest updates.**
- **Graphical representation: The data is represented graphically through charts and graphs to make it easier to understand the trends.**
- **User alerts: The ML model will trigger notifications if an anomaly is detected.**
- **Control features: Depending on the use case, users may be able to send commands back to the IoT device.**



CONCLUSION:

This is a very simple IoT architecture that has the advantage of structuring the process of data gathering, transmission, processing, and analysis. Leveraging MQTT for lightweight communication, robust backend data processing, and analytics with the use of machine learning, it provides great insight to users through interaction with the data on the frontend or mobile application.

This architecture can be further extended by adding more sensors, improving ML models, and optimizing database performance. With rapid advancements in IoT, cloud computing, and AI, such architectures will continue to evolve and enhance even more powerful solutions for data-driven decision-making.

A FLIGHT INTO THE FUTURE: ROBOTIC INSECTS REVOLUTIONIZING POLLINATION

INTRODUCTION

In a groundbreaking leap towards agricultural innovation, researchers at MIT have unveiled a new generation of robotic insects designed to mimic the agility and efficiency of natural pollinators. These tiny, bug-sized bots, weighing less than a paperclip, boast impressive capabilities—hovering for nearly 17 minutes and performing acrobatic feats like double aerial flips—all while being 100 times more efficient than their predecessors.

KEY FEATURES OF THE ROBOTIC INSECTS

- Lightweight Design: Weighs less than a paperclip, enhancing mobility.
- Flight Duration: Can hover for up to 17 minutes—100 times longer than previous versions.
- Advanced Maneuverability: Performs aerial flips, rolls, and precise trajectory tracking.
- Improved Wing Mechanism: Features single flapping wings to boost efficiency and flight control.
- Potential for Autonomy: Can be equipped with sensors and tiny batteries for independent operation.
-

INSPIRATION FROM NATURE

The inspiration behind these mechanical marvels comes directly from nature. Traditional robotic insects struggled with endurance and maneuverability, falling short when compared to their natural counterparts like bees. However, by studying the anatomy and flight mechanics of these natural pollinators, the MIT team has engineered a more robust and agile design. Each robot now features four individual units with a single flapping wing, enhancing lift forces and flight stability.

ADVANCED ENGINEERING AND DESIGN

One of the most remarkable advancements is the reengineering of the robot's actuators—artificial muscles crafted from layers of elastomer and carbon nanotube electrodes. This new configuration minimizes mechanical strain and optimizes the robots' power efficiency, allowing for precise, controlled movements.

TECHNOLOGY STACK

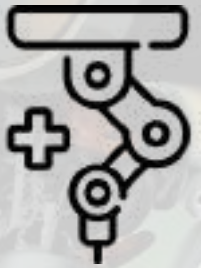
- Developing these robotic insects involves a sophisticated combination of hardware and software technologies, including:
- Artificial Muscles & Materials: Soft actuators made from elastomer and carbon nanotube electrodes.
- Embedded Systems: Microcontrollers and real-time computing platforms for autonomous flight control.
- Machine Learning & AI: Algorithms for navigation, swarm intelligence, and adaptive flight control.
- Computer Vision: Tiny onboard cameras and sensors for obstacle detection and trajectory planning.
- Wireless Communication: Low-latency communication modules to enable swarm coordination.
- Battery & Power Management: Miniature energy-efficient power sources to extend flight durations.

POTENTIAL APPLICATIONS IN AGRICULTURE

Robotic insects have the potential to revolutionize agriculture through precision pollination, offering a viable solution to declining bee population and ensuring food security. These advanced bots could facilitate smart farming by enabling efficient crop pollination in controlled environments such as multilevel warehouses, maximizing yields while reducing reliance on traditional outdoor farming. Additionally, their deployment promotes sustainability, minimizing the need for chemical pollinators and supporting eco-friendly agricultural practices. With their ability to operate autonomously in large numbers, these robotic pollinators provide a scalable solution, allowing mass pollination efforts that can be tailored to different farming needs.

INCOME GENERATION AND COMMERCIAL PROSPECTS

Beyond agriculture, these robotic insects hold immense potential for economic growth. One promising avenue is Pollination-as-a-Service, where farmers could subscribe to robotic pollination services, ensuring efficient and reliable crop production. This innovation also paves the way for Agri-Tech Startups, creating opportunities for businesses to develop and commercialize smart pollination solutions. Additionally, the technology could attract government funding, as investments in sustainable farming and eco-friendly agricultural practices continue to grow. Beyond farming, these robotic insects could find cross-industry applications, such as disaster response, environmental monitoring, and even military reconnaissance, further expanding their commercial viability.



THE FUTURE OF ROBOTIC INSECTS

The vision of Kevin Chen, senior author and head of the Soft and Micro Robotics Laboratory, extends even further. Chen's team is now pushing the boundaries of this technology with aspirations to extend flight durations to over 10,000 seconds and enhance the robots' precision to land and take off from the centre of flowers.

CONCLUSION

As our world grapples with the declining populations of natural pollinators, innovations like these are not just remarkable feats of engineering—they could be essential tools in securing the future of food production. Supported by the U.S. National Science Foundation and a MathWorks Fellowship, this research exemplifies the transformative potential of merging biology with technology.

A NEW DAWN: FUTURISTIC SOLAR POWER TECHNOLOGIES SHAPING THE ENERGY LANDSCAPE

INTRODUCTION

As the global demand for clean energy surges, researchers and engineers are pushing the boundaries of solar power technology, unveiling next-generation advancements that promise higher efficiency, durability, and adaptability. From ultra-thin perovskite solar cells to space-based solar farms, these innovations are paving the way for a sustainable and energy-abundant future.

REVOLUTIONARY SOLAR TECHNOLOGIES

1. Perovskite Solar Cells: The Future of High-Efficiency Photovoltaics

One of the most promising developments in solar energy is perovskite solar cells, which have the potential to outperform traditional silicon panels due to their high efficiency, lightweight nature, and lower manufacturing costs. Unlike conventional solar panels, perovskites can be printed on flexible surfaces, allowing for seamless integration into buildings, vehicles, and wearable technology.

2. Space-Based Solar Power (SBSP): Harvesting Energy Beyond Earth

Scientists are exploring space-based solar farms, where satellites equipped with massive solar arrays capture uninterrupted sunlight and wirelessly transmit energy back to Earth via microwave or laser beams. This method eliminates weather disruptions and ensures 24/7 energy production, potentially generating unlimited clean power.

3. Transparent Solar Panels: Turning Windows into Power Sources

Transparent solar panels utilize organic photovoltaics or quantum dots to absorb specific light wavelengths while allowing visible light to pass through. These futuristic panels could transform skyscrapers, car windows, and even smartphone screens into power generators, significantly reducing dependency on traditional power grids.

4. Floating Solar Farms: Utilizing Water Surfaces for Energy Production

With land becoming scarce, floating solar farms offer a unique solution by installing solar panels on lakes, reservoirs, and oceans. These systems not only maximize solar exposure but also help reduce water evaporation, making them an ideal choice for arid regions.

5. Solar Paint & Solar Textiles: The Next Wave of Energy Harvesting

- **Solar Paint: Embedded with photovoltaic nanoparticles, this special paint can convert sunlight into electricity when applied to walls or rooftops.**
- **Solar Textiles: Wearable fabrics with woven solar fibers could power wearable electronics, medical devices, or even military equipment, making energy portable and accessible anywhere.**

ENGINEERING INNOVATIONS AND TECHNOLOGY STACK

Developing futuristic solar technologies involves cutting-edge advancements in:

- **Quantum Dot & Nanotechnology: Enhances light absorption and conversion efficiency.**
- **Artificial Intelligence & Machine Learning: Optimizes solar energy production and storage.**
- **Wireless Energy Transmission: Enables space-based solar power to be sent to Earth.**
- **Advanced Energy Storage Systems: High-capacity batteries and supercapacitors improve solar power reliability.**

APPLICATIONS AND FUTURE PROSPECTS

1. Sustainable Smart Cities

Next-gen solar technology can power entire cities, reducing carbon footprints while ensuring energy independence. Solar-integrated buildings, roads, and transportation systems will drive the transition to fully renewable urban infrastructure.

2. Space Exploration and Colonization

Solar energy will be critical in powering lunar bases, Mars colonies, and deep-space missions, eliminating the need for fuel-dependent energy sources in extraterrestrial environments.

3. Disaster Relief and Rural Electrification

Portable solar solutions can provide immediate power in disaster-stricken areas or electrify remote villages, bridging the global energy divide and enhancing quality of life.

ECONOMIC AND COMMERCIAL VIABILITY

The commercialization of futuristic solar power technologies opens avenues for:

- **Green Tech Startups: Companies focusing on solar innovation will see massive market growth.**
- **Solar-as-a-Service (SaaS): Subscription-based solar power solutions for businesses and households.**
- **Government Incentives & Investments: Countries will invest heavily in solar research for energy security and climate goals.**

CONCLUSION

With the fusion of solar technology, AI, and advanced materials, the future of renewable energy looks brighter than ever. Whether it's space-based solar farms, transparent panels, or solar-powered cities, these breakthroughs could redefine how we generate, store, and utilize energy, leading us toward a cleaner, more sustainable world.

This revolution in solar technology is more than just an engineering marvel—it is a necessity for humanity's future.

BROCHURE TEAM

DESIGNING TEAM

1. *SIVARAMAKRISHNAN S - ECE'26*
2. *JAI ALWIN M - ECE'27*
3. *PRADEEPAN R - ECE'27*
4. *PERARASU BB - EEE'27*
5. *ABILASH C - ECE'27*
6. *INDRAKUMAR G- EIE'27*
7. *KAMALESH E - ECE'27*

CONTENT TEAM

1. *AKSHAYA S - ECE'26*
2. *NANCY INFANCIA M - ECE'26*
3. *MANIKANDAN J - ECE'26*
4. *AKSHAYA SHREE K - ECE'27*
5. *PRADEEPAN R -ECE'27*
6. *RAVI PRASATH NK - ECE'27*
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8. *SHREYA S - EIE'27*
9. *SATHAIYA PILLAI M - EIE'27*

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