



KALINGA
UNIVERSITY



MINDROID

Exploring Excellence

VOLUME 4, ISSUE 1 (January 2025 - June 2025)



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CONSOLIDATED MESSAGES FOR MINDROID

MESSAGE FROM

Prof. G. S. Tomar

Chairperson

IEEE MP Section



It is a distinct honour to convey my heartfelt congratulations to the IEEE Kalinga University Student Branch on the publication of the latest edition of **MINDROID**. This magazine stands as a remarkable reflection of the branch's unwavering dedication to academic excellence, technological innovation, and the holistic development of its members.

The commitment demonstrated by the editorial team and contributors in curating such a thoughtful and engaging publication is truly praiseworthy. **MINDROID** not only highlights the creative endeavours and accomplishments of our student community but also exemplifies the high standards of professionalism and innovation that IEEE represents.

I commend the Student Branch for its persistent efforts in cultivating a culture of inquiry, collaboration, and continuous learning. Through this magazine, you are not only informing and educating but also inspiring peers across the IEEE network to push intellectual boundaries and contribute meaningfully to the advancement of technology.

Each issue of **MINDROID** reinforces the potential and promise of our future engineers and technologists. It is initiatives like this that enhance the visibility of our Section and strengthen the collective voice of IEEE in driving global change.

My sincere appreciation goes to the entire editorial team for their vision, perseverance, and dedication in bringing this edition to life. May your efforts continue to elevate the standards of student-led publications and foster a vibrant ecosystem of innovation and leadership.

Wishing you continued success and an inspiring journey ahead.

Warm regards,

Chairperson, *IEEE Madhya Pradesh Section*

MESSAGE FROM

Rajdeep Mazumder

US Head of Delta One Trading Technology, HSBC

IEEE Senior Member

New York, USA



Reading through this edition of Mindroid was nothing short of inspiring. After more than a decade immersed in building and leading complex trading systems across global finance, I've learned to recognise something rare when I see it: genuine curiosity paired with real intellectual courage. That's exactly what comes through in every page of this publication.

What struck me most is that Mindroid doesn't feel like a typical student magazine. It feels alive. It's a space where bold questions are welcomed, where ideas are fearlessly explored, and where students clearly aren't just learning—they're thinking. In a time when AI, blockchain, and data science are rewriting the rules of nearly everything, having a platform that encourages fresh, unfiltered thought is not just refreshing—it's essential.

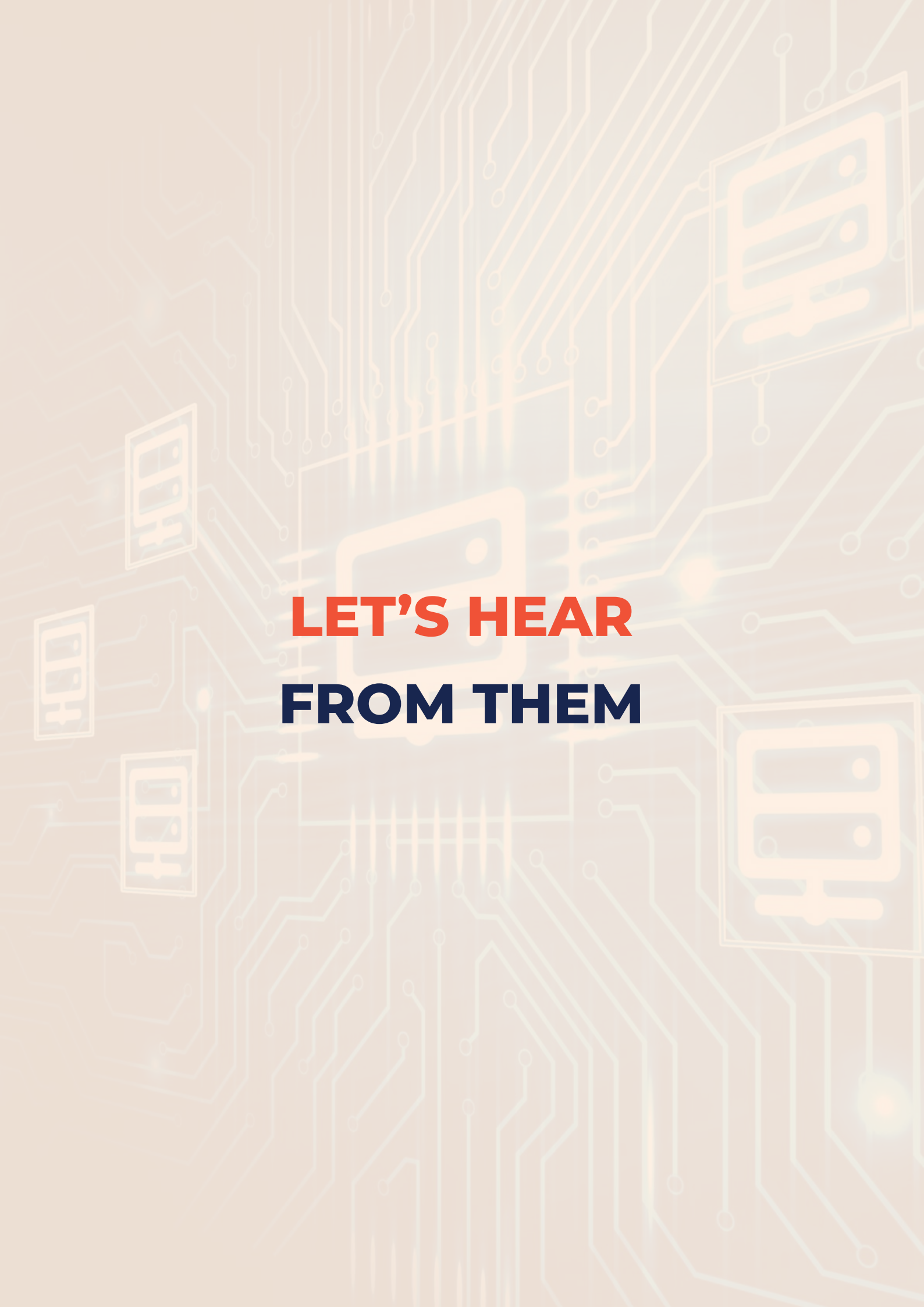
Here's something I've come to believe: innovation doesn't come from fancy job titles or the latest tech. It starts with a simple question—what if?—and the determination to keep asking it until something meaningful emerges. Whether it's about making markets more efficient, designing smarter algorithms, or just solving a real-world problem that matters to someone, the engine behind progress is always the same: people who care deeply enough to try.

Outside of my work at HSBC, I've had the chance to stay closely connected with the academic and research community through IEEE—as a mentor, speaker, and reviewer. And time and again, I'm reminded of how critical it is to bridge those worlds of theory and application. That's why initiatives like Mindroid matter so much. They create that bridge. They ignite conversations. They invite us to listen to voices we might not otherwise hear.

To every student, editor, and faculty member who poured their time, creativity, and energy into this issue—thank you. It truly shows. Keep exploring. Keep pushing the boundaries. Keep asking questions. What you're building here isn't just a magazine—it's a mindset. And that, in today's world, might be one of the most powerful tools of all.

Here's to many more editions, and even more ideas worth sharing.



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LET'S HEAR
FROM THEM

It is with great pleasure that I extend my sincere congratulations to the IEEE Student Branch of Kalinga University on the successful launch of **MINDROID, Volume 4, Issue 1**. This publication reflects the remarkable dedication, intellectual rigour, and collaborative spirit of the students involved in its development.

The continued evolution of **MINDROID** as a platform for insightful discourse and innovative thought is truly commendable. Its content not only showcases the academic and technical capabilities of our students but also contributes meaningfully to the broader dialogue on emerging technologies and advancements in engineering and science.

This milestone is a testament to the vision, commitment, and hard work of the editorial team and contributors. I am confident that **MINDROID** will continue to serve as a valuable medium for knowledge exchange, creative expression, and academic excellence.

Once again, congratulations to the IEEE Student Branch on this noteworthy achievement. I wish you continued success in all future endeavours.



Dr. Rajeev Kumar
Chairman
Kalinga University



Dr. Sandeep Arora
Chancellor
Kalinga University

It is with great pleasure that I extend my warmest congratulations on the release of **MINDROID, Volume 4, Issue 1**, brought forth by the committed and visionary team of the IEEE Kalinga University Student Branch. This publication is a true reflection of the intellectual vigour, innovative spirit, and unwavering pursuit of excellence demonstrated by our talented student community.

Over time, **MINDROID** has established itself as a distinguished forum for the expression of original ideas, pioneering research, and forward-thinking technological insights. This latest edition continues that legacy—featuring compelling content that mirrors the evolving landscape of science, engineering, and innovation.

I deeply appreciate the remarkable collaboration, creativity, and diligence that have shaped this issue. The magazine not only celebrates academic and technical brilliance but also fosters a culture of curiosity, exploration, and growth among our future engineers and thought leaders.

I extend my best wishes to the editorial board, contributors, and the entire IEEE Student Branch for their continued success. May **MINDROID** keep serving as a beacon of knowledge, inspiration, and innovation for the IEEE community and beyond.

MINDROID has consistently served as a distinguished platform for the dissemination of innovative concepts, breakthrough research, and emerging technological trends within the IEEE community. The forthcoming **Volume 4, Issue 1** is poised to offer an engaging and insightful collection of scholarly articles, updates on IEEE initiatives, member achievements, and feature content that showcases the academic and creative excellence of our IEEE student members.

The publication of this magazine stands as a powerful testament to our shared commitment to advancing knowledge, fostering innovation, and contributing meaningfully to the ever-evolving landscape of science and technology. Each edition not only reflects the technical acumen of its contributors but also strengthens the collaborative spirit that defines the IEEE ethos.

I extend my sincere congratulations and best wishes to the IEEE Kalinga University Student Branch for their dedication and success in bringing this edition to life. May **MINDROID** continue to inspire, inform, and elevate the standards of student-led innovation across the IEEE network



Dr. Sandeep Gandhi

Registrar

Kalinga University

MINDROID continues to stand as a vital platform for our aspiring engineers and researchers to articulate their ideas, present original research, and engage meaningfully in the evolving dialogue of science and technology. Each edition reflects the unwavering dedication, ingenuity, and intellectual passion of both our students and their mentors.

This distinguished technical magazine—crafted through the collective efforts of the IEEE Kalinga University Student Branch—captures the essence of innovation, collaboration, and academic excellence that define our institution. It is a proud testament to what can be achieved through vision, teamwork, and a shared commitment to progress.

I extend my sincere congratulations to the editorial board, contributors, and every member of the IEEE Kalinga University Student Branch for bringing **MINDROID, Volume 4, Issue 1**, to fruition. Your work not only enriches the academic environment but also inspires a broader community of learners and leaders.

As we celebrate this achievement, let us recognise the extraordinary effort behind it and draw motivation from the ideas and innovations it presents. May **MINDROID** continue to enlighten, empower, and elevate us in our collective pursuit of excellence.



Dr. R. Shridhar

Vice-Chancellor

Kalinga University

I wholeheartedly commend the IEEE Kalinga University Student Branch for their steadfast dedication to excellence in curating and publishing **MINDROID**. The ingenuity, perseverance, and collaborative spirit demonstrated by the editorial team and contributors are truly commendable. Their efforts have resulted in a publication that not only reflects high standards of academic and creative merit but also embodies the forward-thinking vision of the IEEE community.

I encourage all students, faculty, and members of our academic fraternity to actively engage with **MINDROID**—to contribute, learn, and draw inspiration from the diverse ideas and insightful perspectives it presents. This magazine stands as a vibrant intellectual forum, promoting curiosity, critical thinking, and a deeper appreciation for the transformative impact of technology on society.

On behalf of the institution, I extend my sincere congratulations and best wishes for the continued success of **MINDROID, Volume 4, Issue 1**. May it continue to grow as a beacon of innovation and knowledge-sharing in the years ahead.



Dr. Vijayalaxmi Biradar

SMIEEE, Secretary &
Chairperson IEEE WIE AG
MP Section, Branch
Counsellor, IEEE KU SB
Director IQAC,
Kalinga University



IEEE KU SB **ACTIVITIES**

JANUARY 2025 TO JUNE 2025

IEEE CS SYP HIZE Grand Finale at SRM Institute of Science and Technology

Start Time: **08th January 2025, 10:00 A.M**

End Time: **09th January 2025, 07:00 P.M.**

Venue: **SRM IST, Delhi NCR Campus, India**

Day 1: Insightful Sessions and Industry Interactions

The grand finale of the IEEE CS SYP HIZE began with energy and anticipation at SRM IST, Delhi NCR Campus.

The day commenced with a high-impact panel discussion curated by Mr. Rishabh Raj, featuring six prominent speakers from diverse domains:

- Poorva Shrivastava (Entrepreneur): Emphasised financial readiness as a prerequisite for entrepreneurship.
- Dhairya Gangwani (LinkedIn Strategist): Spoke on personal branding and career development.
- Piyush Sharma – Tricky Man (YouTuber): Shared his digital journey and insights into content monetisation.
- Deepak Dubey, Palak Awasthi, Kshitiz Jaiswal: Highlighted perseverance, adaptability, and real-life career progression.

A key highlight was Poorva Shrivastava's in-depth session on startup building, where she presented a practical roadmap for aspiring entrepreneurs.

Technical sessions enriched the day further:

- AI & Industry Trends by Shivam
- A startup innovation tackling cold-storage-free food preservation
- Product Management Insights by Saptarshi Ghosh

The day concluded with a vibrant cultural evening, featuring music, classical dance, poetry, and beatboxing—blending intellect with artistic celebration.

Day 2: Skill Development and Future-Forward Innovation

Day 2 continued the momentum with career-enhancing sessions:

- LinkedIn Branding by Dhairya Gangwani
- Startup Showcase by Anand Ravi (Neurapie, IIT Patna)
- GitHub Copilot Workshop by Harshavardhan Bajoria

Later sessions included:

- Launch of IKonnnect, a learning and networking platform by iLearnings, inaugurated by Poorva Shrivastava
- Interactive Session by Piyush Sharma on content creation strategies
- A forward-looking Industry Panel Discussion on skills for the future workplace

The event concluded with a formal Valedictory Ceremony, honouring participants and contributors.

In the evening, an exclusive interactive session with Anand Ravi offered actionable insights into startup incubation, idea validation, and business scalability.

The IEEE CS SYP HIZE Grand Finale delivered a dynamic combination of leadership development, technical innovation, and cultural celebration. With engaging sessions, industry interactions, and hands-on learning experiences, it proved to be a transformative platform for aspiring technologists and future leaders.

Day 1



Team Kalinga University representing with pride at the IEEE CS SYP HIZE Grand Finale



Delivering ideas during the dynamic pitch session at SRM IST



Inspiring interaction with Jyotika Ma'am during the Grand Finale



Capturing a moment of mentorship and pride with Jyotika Ma'am



Group photo of participants and organisers on Day 1 of the IEEE CS SYP HIZE Finale.

Day 2



IEEE KU SB team receiving the token of appreciation during valedictory ceremony



Dr. Vijayalaxmi Ma'am being presented with a memento for her contribution

Standard Carnival

Date: **07th January 2025**

Time: **10:00 A.M. IST to 04:00 P.M. IST**

Venue: **Kalinga University**

The "Standard Carnival," organised by the IEEE Kalinga University Student Branch (KU SB) in collaboration with the Bureau of Indian Standards (BIS), Raipur, was a vibrant and impactful event held on the Kalinga University campus. The event aimed to raise awareness about the importance of quality standards in both industry and everyday life, especially among students.

Designed to bridge the gap between technical knowledge and real-world application, the carnival featured interactive exhibits, educational activities, and cultural programs. A key highlight was the industry exhibition showcasing BIS-certified products, where students, academicians, and professionals engaged in meaningful discussions about standards, innovation, and quality control.

The carnival also included engaging quizzes, painting competitions, and performances that emphasised the themes of sustainability and learning. A standout attraction was the Robotics Technology Display by Kalinga University students, which showcased cutting-edge projects in automation and AI, inspiring young minds to explore technology-driven solutions.

By bringing together industry experts, educators, and future technologists, the Standard Carnival successfully promoted the value of national and international standards, sustainability, and innovation. It was more than an academic gathering—it was a celebration of knowledge, creativity, and purposeful collaboration.



Group Photograph of the Event



During the Event



Students explore BIS-certified exhibits and robotics displays with keen curiosity



Members of IEEE KU SB explain the kit

STEM Exploration at Education Excellence Conclave

Date: 11th January 2025

Time: 09:30 A.M. IST to 05:00 P.M. IST

Event: **Babylon Capital Naya Raipur, Chhattisgarh**

On January 11, 2025, Kalinga University proudly participated in the One-Day STEM Exploration event held during the prestigious Education Excellence Conclave at Babylon Capital, Raipur. Representing the university were Mr. Ashwan Kumar Sahu, Dr. Anita Verma, and Mr. Abhishek Gupta from the IQAC department, who presented an inspiring display of educational robotics.

The university's exhibit featured cutting-edge mobile robots like **mBot and Codey Rocky**, demonstrating the real-world application of robotics and programming in modern education. These engaging demonstrations captivated students and educators alike, showcasing how hands-on technology can make learning more interactive, creative, and impactful.

The event focused on developing essential 21st-century skills, such as problem-solving, critical thinking, and innovation. Kalinga University's participation underscored its dedication to advancing STEM (Science, Technology, Engineering, and Mathematics) education and preparing future-ready learners.

Through its presence at the conclave, Kalinga University reinforced its role as a leader in promoting experiential learning and technological empowerment. The showcase not only highlighted the university's innovative approach but also inspired attendees to embrace STEM as a powerful tool for shaping a smarter, more creative future for India.



Team member introducing STEM concepts and innovative educational tools



Engaging with visitors to collect insights, and suggestions for further improvement.



Kalinga University team receives a token of appreciation for excellence in STEM education showcase



Group Photograph

Meeting For Planning a One-Day Hands-on Training Session on Python, Coding and Robotics

Date: **24th January 2025**

Time: **10:00 A.M. IST to 06:00 P.M. IST**

Venue: **Kalinga University, Naya Raipur, Chhattisgarh, India**

On January 24, 2025, a strategic planning meeting was conducted at Kalinga University to finalise arrangements for the upcoming "One-day Hands-on Training on Python, Coding, and Robotics" scheduled for January 25, 2025. The event is being organised by the IEEE Kalinga University Student Branch (KU SB) in collaboration with BDS Education.

The meeting brought together key organisers and stakeholders to ensure the seamless execution of the training program. Attendees included:

1. Dr. Vijayalaxmi Biradar – Counsellor, IEEE KU SB
2. Col. N. C. Gupta – Director, Bharat Drone Systems
3. Mr. Pankaj Kabir Panthi – Technical/IT Head, BDS Education
4. Mr. Piyush Srivastava – Chair, IEEE KU SB
5. Mr. Vedant Raj – Vice-Chair, IEEE KU SB
6. Ms. Simpi Kumari – Secretary, IEEE KU SB
7. Ms. Koda Aayushi Rao – Chair, IEEE KU SB WIE Affinity Group
8. Mr. Priyanshu Singh – Chair, IEEE KU SB AESS Chapter

The meeting focused on discussing event logistics, training modules, technical setup, and participant engagement strategies. With contributions from both academic and industry experts, the team laid out a detailed plan to ensure the workshop delivers a high-impact, hands-on learning experience.

This collaborative initiative reflects IEEE KU SB's commitment to promoting technical excellence and innovation through practical education in emerging fields.

One-Day Hands-on Training on Python, Coding and Robotics

Date: **25th January 2025**

Time: **09:00 A.M. IST to 05:00 P.M. IST**

Venue: **Seminar Hall, Kalinga University**

On January 25, 2025, the IEEE Kalinga University Student Branch, in collaboration with BDS Education, successfully organised a One-Day Hands-on Training on Python, Coding, and Robotics at Kalinga University, Naya Raipur. The event brought together 49 participants (44 offline and 5 online), supported by 5 student volunteers and 7 faculty members from the IQAC department under the leadership of Dr. Vijayalaxmi, Director, IQAC. The training featured expert-led sessions by Col. N.C. Gupta, Director of Bharat Drones Systems, introduced the participants to the evolving world of automation, coding, and the significance of internships in the tech industry. He also demonstrated the AirBlock drone, emphasising its safety features and programmability. Mr. Pankaj Kabir Panthi, Technical/IT Head at BDS Education, conducted an engaging, step-by-step coding session beginning with sprite programming and progressing to real-world applications using educational robots like Codey Rocky and mBot. Participants gained hands-on experience in programming robots to perform tasks such as navigating circular and square paths while being introduced to AI and IoT-based extensions. The session further included working with modern programmable boards like Halocode and CyberPi, as well as beginner-friendly tools like the Znatok Electronics 390 Kit and Arduino Starter Kit, which offer snap-on components ideal for learning embedded systems. The event concluded with a certificate distribution ceremony, recognising the active engagement and curiosity of the participants. Overall, the program successfully combined technical skill-building, interactive learning, and practical exposure, reaffirming IEEE KU SB's commitment to promoting innovation-driven, experiential STEM education among students.



Poster of the Event



Honouring our distinguished guest during the inauguration.



A warm welcome to the expert speaker initiating the training session



Lively discussions during programming interactive sessions on coding and robotics



Demonstrating innovative STEM ideas



Exploring Codey Rocky Robot



Dr. Vijayalaxmi addressing the gathering



Group Photograph of the Event

IEEE Membership Benefits Awareness 2025

Date: **25th February 2025**

Time: **09:00 A.M. IST to 10:00 A.M. IST**

Venue: **Auditorium, Kalinga University**

On 25th February 2025, the IEEE Kalinga University Student Branch (IEEE KU SB) successfully conducted the IEEE Membership Benefits Awareness 2025 session, aimed at enlightening students about the wide-ranging advantages of becoming an IEEE member. The session was designed to inspire students to join the global IEEE community and explore its diverse professional, technical, and academic growth opportunities.

The session was led by Dr. Vijayalaxmi Biradar, Director of IQAC, Kalinga University, and Counsellor of IEEE KU SB. In her engaging talk, Dr. Biradar highlighted the numerous benefits that IEEE membership offers to students, including:

- Access to premium technical content through platforms like IEEE Xplore and other digital resources
- Networking opportunities with global industry experts, researchers, and professionals
- Recognition and support via IEEE awards, scholarships, and competitions
- Professional exposure through IEEE-hosted conferences, workshops, webinars, and industrial visits
- Skill enhancement through technical events, coding contests, and mentorship initiatives
- Project funding opportunities through IEEE programs such as IEEE SIGHT, IEEE HTB, and more

The session emphasised how IEEE membership not only adds value to a student's academic journey but also helps build a solid foundation for future careers in technology and engineering. With an enthusiastic response from attendees, the event reaffirmed IEEE KU SB's commitment to fostering a culture of innovation, leadership, and lifelong learning.



Poster of the Event



Students enthusiastically participating in the IEEE Awareness drive



Participants gearing up to explore IEEE membership opportunities



Highlighting the valuable benefits and a global reach of IEEE membership.

Magazine Launch on the Occasion of International Women's Day

Date: **08th March 2025**

Time: **10:00 A.M. IST to 11:30 A.M. IST**

Venue: **Kalinga University, Naya Raipur, Chhattisgarh**

International Women's Day Celebration at Kalinga University

Kalinga University marked International Women's Day with great enthusiasm, celebrating the strength, achievements, and contributions of women from all walks of life. The highlight of the event was the launch of the special edition magazine **WE स्मृति 2.0**, a vibrant collection of inspiring stories and articles penned by homemakers, students, doctors, and professionals. This edition served as a powerful tribute to the diverse voices and talents of women.

Adding depth to the celebration, senior managers from ICICI Bank conducted an enlightening session on Mutual Funds, Equity, and Financial Planning. Their interactive talk offered valuable insights and practical knowledge aimed at empowering women with financial literacy and independence.

The celebration created an atmosphere of encouragement, learning, and empowerment. It was not just a tribute to womanhood but also a platform for sharing knowledge, fostering inspiration, and promoting confidence among women to take charge of their futures. The event concluded on a high note, leaving everyone motivated and proud to be part of this vibrant celebration.



Address by Chief Guest, Pratibha Bharthi



Poster of the Event



During the Session



Magazine Launch



The Magazine "WE स्मृति 2.0"



The Editorial Team



Group Photograph of the Event

15-Day Summer Camp 2025 on Python, Coding & Robotics

Start time: **20th Mar 2025 09:30 A.M. IST**

End time: **11th April 2025 11:30 A.M. IST**

Venue: **MM School, Near Swami Vivekanand Airport, Raipur**

Kalinga University, Naya Raipur, in association with **MM School**, successfully conducted a vibrant and innovative Summer Camp dedicated to Artificial Intelligence, Robotics, and Coding. Aimed at nurturing a passion for technology among school students, the camp turned learning into an exciting hands-on journey of exploration and creativity.

The camp introduced young learners to AI and robotics through interactive lessons and activities. With visual programming tools like **mBlock**, students quickly grasped the fundamentals of coding while having fun building animations and digital games.

Participants also delved into the world of robotics using educational kits like **mBot**, **CyberPi**, and **Codey Rocky**. They programmed robots to perform smart tasks such as obstacle avoidance and joystick-based movements, applying concepts of sensors, logic, and automation.

The program emphasised the core principles of STEM education, fostering skills such as problem-solving, critical thinking, and teamwork. Guided by expert mentors, students were encouraged to experiment and innovate throughout the sessions.

The camp concluded with a project exhibition, where students showcased their smart creations, reflecting their learning journey and creativity. It was a week filled with inspiration, tech exploration, and the joy of turning imagination into innovation.



Poster



Session By:
Dr. Vijayalaxmi Ma'am



During the Session



A memorable group photo,
marking the end
of a successful summer camp



Felicitating the participants
of the summer camp



Expressing our gratitude
towards MM School



Closing Ceremony

Community Survey-Kuhera

Date: **22nd March 2025**

Time: **10:00 A.M. IST to 12:00 P.M. IST**

Location: **Kuhera, Naya Raipur, Chhattisgarh**

The community survey conducted in **Kuhera** village aimed to understand the ground realities and identify the major problems faced by the villagers. During this survey, our team visited different parts of the village and interacted directly with the local residents, including elders, women, youth, and farmers. Through these interactions, we tried to get a clear picture of their day-to-day challenges. The survey revealed several basic issues such as a lack of clean drinking water, inadequate sanitation facilities, poor road conditions, limited access to education and healthcare services, unemployment, dependence on traditional farming methods, and a lack of awareness about government schemes.

We observed that most households did not have access to safe drinking water and relied on handpumps or distant sources. Due to the lack of proper toilets, open defecation was still common in some areas. In terms of education, although schools existed, they lacked proper infrastructure and digital learning resources. Healthcare services were almost non-existent, with no nearby health centres or even basic medical facilities. Farmers were still dependent on old farming techniques, with poor irrigation systems. Youth and women had very limited employment opportunities, resulting in weak economic conditions for many families.

This survey taught us that identifying problems is only the first step—true development requires working together with the community to find and implement sustainable solutions. This effort was not just a survey but a meaningful step toward the holistic development of Kuhera village.



Understanding daily challenges through face-to-face conversations with the villagers



Open discussions, identifying key areas of concern in the village

Training on STEM Kit

Date: **24th March 2025**

Time: **12:00 P.M. IST to 02:00 P.M. IST**

Venue: **Kendriya Vidyalaya, WRS Colony, Raipur**

On 24th March 2025, Kendriya Vidyalaya No.1, WRS Colony, Raipur - 492008, organised an enriching training session on STEM Kits exclusively for teachers. The program aimed to enhance teaching methodologies by integrating hands-on STEM learning into the classroom, making science, technology, engineering, and mathematics both accessible and exciting for students.

Renowned educator and STEM expert Dr. Vijayalaxmi was invited as the lead trainer for the session. With her vast experience in the field, she guided teachers on effectively using STEM kits to create interactive and practical learning experiences. Her training focused on how to spark student curiosity, promote critical thinking, and foster creativity through real-world applications of STEM concepts.

The session emphasised not just the educational value of the kits but also how they can be used to inspire students to explore future careers in STEM fields. Teachers learned innovative strategies to engage students actively, turning abstract concepts into tangible learning moments.

Overall, the training was a successful step towards transforming traditional classrooms into hubs of innovation, discovery, and future-ready learning.



During the session

STEM Exploration at Standard Carnival

Date: **28th March 2025**

Time: **02:30 P.M. IST to 06:00 P.M. IST**

Venue: **Palaud, Naya Raipur, Chhattisgarh, India**

Students from the IEEE Student Branch of Kalinga University conducted an inspiring Tech Awareness Camp in Palaud village, aimed at bridging the gap between rural communities and emerging technologies. The camp showcased cutting-edge educational tools such as mBot, Codey Rocky, Avishkaar 5-in-1 Robot, drones, and AR-VR headsets, sparking excitement among villagers—especially school students.

The main objective of the initiative was to introduce the fundamentals of robotics, coding, and emerging tech in a simple, engaging manner. With hands-on demonstrations and easy-to-understand explanations, the team made learning both fun and accessible.

Curious residents flocked to the stalls, eager to experience the wonders of technology firsthand. Children interacted with robots, explored virtual environments through VR headsets, and watched drones in action—all under the guidance of enthusiastic student volunteers.

The event not only ignited interest in STEM (Science, Technology, Engineering, and Mathematics) but also planted seeds of innovation in young minds. It served as a powerful example of how student-led initiatives can bring meaningful change to underserved areas through education and technology.

Overall, the camp was a resounding success, fostering curiosity, inspiration, and a passion for learning within the community.



Group Photograph of the Event

Community Survey-Tandul

Date: **29th March 2025**

Time: **10:00 A.M. IST to 12:00 P.M. IST**

Location: **Tandul, Naya Raipur, Chhattisgarh**

The community survey conducted in **Tandul** village aimed to understand the ground realities and identify the major problems faced by the villagers. During this survey, our team visited different parts of the village and interacted directly with the local residents, including elders, women, youth, and farmers. Through these interactions, we tried to get a clear picture of their day-to-day challenges. The survey revealed several basic issues such as a lack of clean drinking water, inadequate sanitation facilities, poor road conditions, limited access to education and healthcare services, unemployment, dependence on traditional farming methods, and a lack of awareness about government schemes.

We observed that most households did not have access to safe drinking water and relied on handpumps or distant sources. Due to the lack of proper toilets, open defecation was still common in some areas. In terms of education, although schools existed, they lacked proper infrastructure and digital learning resources. Healthcare services were almost non-existent, with no nearby health centres or even basic medical facilities. Farmers were still dependent on old farming techniques, with poor irrigation systems. Youth and women had very limited employment opportunities, resulting in weak economic conditions for many families.

This survey taught us that identifying problems is only the first step—true development requires working together with the community to find and implement sustainable solutions. This effort was not just a survey but a meaningful step toward the holistic development of **Tandul village**.



Interacting with the people



Discussing the Problem of the Villagers

IEEE KU SB 3rd Anniversary Celebration

Date: **04th April 2025**

Time: **04:00 P.M. IST to 05:00 P.M. IST**

Venue: **Kalinga University, Kotni, Naya Raipur, Chhattisgarh**

The IEEE Student Branch of Kalinga University joyfully celebrated its 3rd anniversary, marking a proud milestone of innovation, learning, and community engagement. The event brought together enthusiastic IEEE student members, dedicated faculty, and the esteemed Branch Counsellor to honour three impactful years of technological growth and collaboration.

A highlight of the celebration was the ceremonial cake-cutting, led by the student members and the Branch Counsellor, symbolising unity, shared achievements, and the vibrant journey of the branch. The atmosphere was filled with excitement and pride as members reflected on their contributions and growth.

Since its inception, the IEEE Kalinga University Student Branch has organised numerous technical workshops, seminars, and outreach programs. These initiatives have not only strengthened students' technical skills but also cultivated leadership, teamwork, and a spirit of innovation.

As we celebrate this meaningful occasion, we reaffirm our commitment to the IEEE mission—advancing technology for the benefit of humanity. The branch looks ahead to a future filled with new opportunities, continued learning, and impactful contributions to the tech community.



Poster of the Event



Cake of the Event



Celebration

Two-Day Hands-on Training on Python, Coding and Robotics

Date: **07th-08th April 2025**

Venue: **SJM Institute of Technology, Chitradurga, Karnataka, India, 577502**

A highly engaging and practical **two-day hands-on training program** was successfully conducted, focusing on block-based coding using the **mBlock platform** and robotics integration with **Codey Rocky, mBot, and CyberPi**. The training aimed to introduce participants to the exciting world of **visual programming and educational robotics** in a fun, beginner-friendly environment.

Day 1 began with an introduction to **block-based coding** using mBlock software. Participants explored core programming concepts such as **logic building, loops, conditionals, and event handling**, all through intuitive drag-and-drop blocks. The sessions helped participants strengthen their **computational thinking and algorithmic problem-solving skills**, eliminating the initial barriers of text-based coding.

Day 2 shifted the focus to real-world applications through robotics. Using **Makeblock's Codey Rocky, mBot, and CyberPi**, participants applied their coding knowledge to program robots for **motion control, obstacle detection, sensor-based responses, LED and sound control**, and more. Interactive mini-projects enabled participants to tackle challenges creatively while reinforcing what they had learned.

The event concluded with exciting **project demonstrations**, where participants showcased their creations, followed by **feedback sharing and certificate distribution**. The program was widely appreciated for its **hands-on approach**, especially by **students and beginners** with a keen interest in **STEM, robotics, and coding**.

This training not only sparked curiosity but also empowered learners with the confidence to explore the vast possibilities of programming and robotics.



Participants learning the fundamentals of block-based coding using the mBlock platform



Students engaged in Assembling and Programming Robots



Group Photo of the Event



Students exploring the mBlock5 software

Faculty Development Program at SJM Institute of Technology

Date: **09th April 2025**

Time: **09:00 A.M. IST to 05:00 P.M. IST**

Venue: **Sir M V Seminar Hall, SJMIT, Chitradurga, Karnataka**

The Department of Electronics and Communication Engineering at SJM Institute of Technology successfully organised a one-day Faculty Development Program (FDP) on “IEEE Project Proposal Writing for Successful Funding Acquisition and NAAC/NBA Accreditation: Enhancing Faculty Expertise in Quality Assurance” on 9th April 2025.

This thoughtfully curated program aimed to empower faculty members with the essential knowledge and skills required to develop impactful IEEE project proposals, secure competitive research funding, and deepen their understanding of documentation, data management, and quality benchmarks vital for NAAC and NBA accreditation.

The session was conducted by Dr. Vijayalaxmi Biradar, Director of IQAC, Kalinga University, Naya Raipur, a renowned academician and expert in institutional accreditation and research proposal writing. Dr. Biradar shared practical strategies and valuable insights into enhancing academic quality, improving institutional rankings, and aligning proposal development with the expectations of funding agencies.

The FDP proved to be a highly enriching experience, enabling faculty members to refine their proposal writing capabilities, better comprehend accreditation standards, and contribute meaningfully to their institution's academic advancement.



Poster of the Event



Group Photograph of the Event

Transformation Through the NAAC Accreditation Process

Date: **10th April 2025**

Venue: **Seminar Hall, Building No. 3, KEI Main Campus, Barasat**

Kingston Educational Institute organised an impactful seminar titled “Transformation Through NAAC Accreditation Process” at its main campus in Barasat. The session was graced by Dr. Vijayalaxmi Biradar, Director of IQAC, Kalinga University, Naya Raipur, who served as the keynote speaker.

Dr. Biradar, a distinguished expert in institutional quality assurance, shared deep insights into how the NAAC accreditation framework can drive transformation in higher education institutions. Her session focused on key strategies for achieving excellence through effective preparation, structured documentation, and strategic planning aligned with NAAC criteria.

Addressing a diverse audience of faculty members, academic leaders, and administrators, she emphasised how NAAC not only serves as a quality benchmarking tool but also fosters a culture of continuous improvement, transparency, and accountability within institutions.

The seminar was a vital part of Kingston Educational Institute's commitment to elevating academic standards and promoting a robust internal quality assurance system. It highlighted the institution's proactive approach toward achieving national quality benchmarks and fostering an environment of academic excellence.

The event concluded with an engaging Q&A session, leaving attendees inspired and better equipped to contribute to their institution's journey toward NAAC accreditation and quality enhancement.



Poster of the Event



Felicitation at the event

STEM Exploration at Adarsh Higher Secondary School

Date: **12th April 2025**

Time: **10:00 A.M. IST to 11:30 A.M. IST**

Venue: **Adarsh English Medium Hr. Sec. School, Tatibandh, Raipur**

The IEEE Student Branch of Kalinga University organised an engaging STEM Exploration Session at Adarsh School, Telibandha, Naya Raipur, under the expert guidance of Dr. Vijayalaxmi and her dedicated team. The initiative aimed to ignite curiosity and foster a love for Science, Technology, Engineering, and Mathematics (STEM) among school students.

The session featured interactive learning experiences, where students were introduced to the fundamentals of block-based coding and basic programming in a fun and accessible way. The highlight of the event was the live demonstration of educational technologies such as Codey Rocky, mBot, and drones. These hands-on activities brought abstract concepts to life, making technology both exciting and understandable.

Students participated enthusiastically, exploring how robots work, how coding commands control movement, and how drones operate—all guided by the encouraging support of the IEEE volunteers.

This impactful session not only provided valuable exposure to emerging technologies but also inspired young minds to imagine themselves as future innovators and problem solvers. The event successfully promoted STEM awareness and left students motivated to continue their journey into the world of technology.



Young students captivated by the live robotics demonstrations at Adarsh School



Sparking interest in STEM through fun, hands-on coding discussions



Guiding curious minds toward a future in innovation and technology

10-Day Summer Camp 2025 on Python, Coding & Robotics

Start time: **01st May 2025 07:00 A.M. IST**

End time: **10th May 2025 08:00 A.M. IST**

Venue: **Adarsh Vidyalaya, Mowa**

Kalinga University, Naya Raipur, in collaboration with **Adarsh Vidyalaya**, Mowa, Raipur, successfully organised a vibrant and educational week-long Summer Camp on Artificial Intelligence, Robotics, and Coding. Designed to ignite curiosity and creativity among young minds, the camp offered a dynamic platform for school students to explore the rapidly evolving world of technology in a fun, engaging, and hands-on environment.

Throughout the camp, students were introduced to the exciting fundamentals of AI, robotics, and block-based coding using beginner-friendly platforms like mBlock. Expert trainers and educators carefully structured the sessions to blend knowledge with enjoyment, helping children understand how machines can “think,” sense their environment, and perform intelligent actions.

Participants engaged in practical, interactive learning as they worked with educational robots such as **mBot**, **Codey Rocky**, and **CyberPi**. They learned to program these robots to complete real-world tasks like **line-following**, **obstacle avoidance**, and **joystick-controlled navigation**. In addition to robotics, students also explored their creative side by developing **games**, **animations**, and **interactive digital projects** using logical thinking and coding skills.

The camp strongly emphasised **STEM (Science, Technology, Engineering, and Mathematics)** education, aiming to foster critical problem-solving abilities, collaborative teamwork, and confidence in using modern technologies. It gave students a rare opportunity for early exposure to the innovative tools and concepts that are shaping the future.

One of the key highlights of the camp was the **final project showcase**, where students proudly presented their creations. Their projects reflected not only their technical understanding but also their creativity, perseverance, and enthusiasm for learning. From obstacle-avoiding robots to interactive storytelling and games, the exhibits captured the spirit of innovation that the camp aimed to instil.

With expert guidance and personal mentoring provided throughout the week, each participant felt encouraged and empowered. The energetic atmosphere, combined with hands-on exploration, made the summer camp an unforgettable experience filled with learning, laughter, and technological discovery.

Key Highlights of the Camp:

- Introduction to Artificial Intelligence and machine thinking
- Basics of robotics, sensors, and movement
- Block-based coding and logical thinking using mBlock
- Programming real robots: mBot, Codey Rocky, and CyberPi
- Game and animation development projects
- Collaborative activities and teamwork
- Final exhibition of student-created tech projects

The Summer Camp at Kalinga University proved to be more than just an introduction to technology—it was a celebration of young minds discovering the joy of building, programming, and innovating for the future.



Student exploring mBlock



Student testing the Robot



Collaborative teamwork fuels innovative ideas and solutions



Student testing the Robot



Certificate Distribution



Group Photo

10-Day Summer Camp 2025 on Python, Coding & Robotics

Start time: **01st May 2025 08:00 A.M. IST**

End time: **10th May 2025 10:00 A.M. IST**

Venue: **Adarsh Vidyalaya, Tatibandh**

Kalinga University, Naya Raipur, in partnership with **Adarsh Vidyalaya, Tatibandh, Raipur**, hosted an engaging week-long Summer Camp centred on Artificial Intelligence, Robotics, and Coding. This educational initiative provided an immersive experience for school students, encouraging them to dive into the world of emerging technologies through practical learning and creative experimentation.

Students explored the basics of AI and robotics, learning how intelligent systems process data and respond to their surroundings. Using tools like **mBlock**, they were introduced to visual programming, enabling them to build and control their own digital creations.

Hands-on sessions allowed participants to work directly with interactive robots such as **mBot**, **CyberPi**, and **Codey Rocky**. From coding obstacle-avoiding vehicles to joystick-operated robots, students transformed their ideas into working prototypes.

The program emphasised **STEM education**, aiming to develop logic, teamwork, creativity, and technological fluency. The camp culminated in a **project showcase**, where students confidently presented their work, highlighting their growth in both knowledge and skills.

This transformative camp served not just as a learning opportunity but as a celebration of youthful imagination and innovation.



Event Poster



Students learning interesting STEM concepts



Hands-on learning as students assemble



Students testing their robotic prototypes with precision and excitement



A cheerful group moment with enthusiastic participants



Participants receiving certificates



Certificate Distribution



Participants gather for a proud group photo

10-Day Summer Camp 2025 on Python, Coding & Robotics

Start time: **01st May 2025 11:00 A.M. IST**

End time: **10th May 2025 12:00 P.M. IST**

Venue: **Venkateshwar Signature School, NH- 06, Near International Cricket Stadium, Raipur, Chhattisgarh, India**

In a collaborative effort with **Venkateshwar Signature School, NH-06**, Kalinga University, Naya Raipur, organised an impactful week-long Summer Camp focused on Artificial Intelligence, Robotics, and Coding. The initiative was aimed at introducing school students to future-ready technologies in a playful and educational environment.

Participants were introduced to AI concepts, such as machine learning and automation, and learned how coding can be used to design smart applications. With the help of beginner-friendly platforms like **mBlock**, students developed interactive games, animations, and logic-based programs.

The camp featured engaging robotics sessions using **mBot**, **Codey Rocky**, and **CyberPi**, allowing students to apply their knowledge to build robots that could perform tasks such as line tracking, obstacle detection, and movement control via joysticks.

The focus on **STEM learning** ensured that students gained valuable insights into science, technology, and engineering through collaborative projects and real-time coding challenges. The week concluded with a **project demonstration**, where students proudly shared their creations with peers and mentors.

This vibrant and empowering experience encouraged students to explore their potential and envision themselves as future innovators.



Students immersed in a foundational STEM lessons



Engaging robotics session bring ideas to life



Student exploring mBlock5 software



Proud recognition of effort and learning with a certificate of participation



Students learning interesting STEM & Robotics concepts



Participants receiving certificates



Participants receiving certificates

IEEE Women in Engineering International Leadership Conference

Dates: **15th-16th May 2025**

Venue: **Signia by Hilton, San Jose, California, USA**

The 10th IEEE Women in Engineering International Leadership Conference (WIE ILC) brings together over 1,000 global leaders in STEM to foster professional and personal growth for mid- and senior-level women technologists. The conference serves as a global platform to build leadership capacity, promote innovation, and inspire sustained impact in the technology sector.

Objectives:

- To deliver cutting-edge leadership and professional development content through high-impact sessions, workshops, and keynote addresses.
- To create meaningful connections between participants and leading organisations for recruitment, collaboration, and mentorship.
- To offer structured peer-to-peer networking and mentoring opportunities that promote mutual growth and support.
- To continually innovate the conference format and delivery, ensuring engaging, relevant, and impactful experiences for all attendees.

Outcomes:

- Enhanced leadership capabilities and strategic thinking tailored for AI driven and rapidly evolving tech environments.
- Expanded professional networks and access to global thought leaders, mentors, and hiring companies.
- Improved understanding of industry trends, challenges, and opportunities across diverse sectors of STEM.
- Increased visibility and empowerment of women leaders in engineering and technology.



Dr. Vijayalaxmi
(Program Committee Co-Chair)
at the event



Volunteers of IEEE WIE ILC 2025



Torch-Bearers of IEEE MP
Section – Dr. G. S. Tomar
(Chairperson) & Dr. Vijayalaxmi
(Secretary & WIE Chair) – at
IEEE WIE ILC 2025



Global leaders and delegates unite to celebrate
the resilience of Women in Technology



Contributing insights during expert panel discussion



Group photo with global leaders

The background is a light beige color with a complex pattern of thin, light green circuit lines. Scattered throughout the background are several stylized, light green computer monitor icons. The text is centered in the middle of the page.

ACHIEVEMENTS **&** **RECOGNITIONS**

Received Certificate of Appreciation for Contribution as a Judge of the 2025 IEEE Women in Engineering Awards



Received an IEEE R10 Professional Certification Grant 2025



Program Committee Co-Chair – IEEE Women in Engineering International Leadership Conference during 15th-16th May 2025, San Jose, USA



Selected as Entrepreneurship Ambassador under IEEE Region 10 (ACEI)

Madhya Pradesh Section			
Professional Lead	Dr. Vijayalaxmi Biradar	Madhya Pradesh Section	Kalinga University, Raipur, Chhattisgarh
Professional Lead	Dr. Ashish Kumar Singhal	Madhya Pradesh Section	Rajiv Gandhi Prodyogiki vishwavidhyalay Bhopal
Member	Dr. Namrata Tapaswi	Madhya Pradesh Section	Acropolis Institute of Technology and Research, Indore
Member	Suhel Ahamed	Madhya Pradesh Section	Guru Ghasidas Vishwavidyalaya, Bilaspur
Member	Brijesh Patel	Madhya Pradesh Section	MATS University, Raipur, Chhattisgarh
Member	Dr Manish D Sawale	Madhya Pradesh Section	Oriental Institute of Science and Technology, Rajiv Gandhi Technological University, Bhopal
Member	Dr. Nitika Vats Doohan	Madhya Pradesh Section	SAGE University, Indore

Selected as Secretary & WIE Chair, IEEE Madhya Pradesh Section



Certificates of Appreciation received from MM School, Nakti, Raipur, for the successful completion of a 15-Day STEM Summer Camp from 20th March to 5th April 2025



Received approval for the establishment of the IEEE Computer Society Chapter under the IEEE Kalinga University Student Branch



Cecelia Jankowski
Managing Director
Member and Geographic Activities
Phone + 1 732 562 5504
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13 June 2025

Vedant Raj
Kotni Naya Raipur
Raipur, Chhattisgarh 492101
India

Dear Vedant Raj:

Congratulations! It is a pleasure to inform you that the requirements of the Member and Geographic Activities Board Operations Manual have been met and the IEEE Computer Society Student Branch Chapter at the Kalinga University has been formed. The effective date of this Student Branch Chapter formation is 11 June 2025.

On behalf of the IEEE and its members, I would like to welcome your Branch Chapter to the student program. If you have any questions or need assistance, please do not hesitate to contact our Student Services department at:

Student Services
IEEE Member and Geographic Activities Department
445 Hoes Lane
Piscataway, NJ 08854

student-services@ieee.org, email
+1 732 562 5527, phone
+1 732 463 9359, fax

Sincerely,

Cecelia Jankowski

Cecelia Jankowski
Managing Director
Member and Geographic Activities

cc: T. Hashimoto – Region 10 Director
N. Tungkasikij – Regional Student Representative – South Asia Pacific
N. Leelawat – Region 10 Student Activities Chair – South Asia Pacific
H. Washizaki – Computer Society President
A. Seely – Computer Society Vice President - Membership and Geographic Activities
Y. Liu – Computer Society Geographic Activities Committee
G. Tomar – Madhya Pradesh Section Chair
S. Kumar – Madhya Pradesh Section Student Activities Chair
V. Biradar – Student Branch Counselor
P. Srivastava – Student Branch Chair



ARTICLES

Electronics: A Future Forged in Innovation, Driven by New Expertise

The electronics industry is undergoing a phenomenal transformation, driven by relentless innovation and the convergence of groundbreaking technologies. This evolution is not only reshaping our daily lives through smarter devices and interconnected systems but also creating a vibrant landscape of new job roles and demanding a highly specialised workforce.

One of the most significant trends is the miniaturisation and integration of electronics, leading to advancements in flexible and printed electronics. This enables incredibly thin, lightweight, and bendable devices, powering next-generation wearables, foldable displays, and sophisticated medical sensors. Complementing this is the rise of Quantum and Neuromorphic Computing, promising exponentially faster data processing and brain-like intelligence for complex applications.

The pervasive influence of Artificial Intelligence (AI) and Machine Learning (ML) is revolutionising every facet of electronics, from design automation and predictive maintenance to smart manufacturing and self-optimising networks. Dedicated AI hardware (NPUs, TPUs, custom ASICs) is enabling efficient on-device AI, giving rise to Edge AI for real-time processing without cloud dependency.

Furthermore, the push for energy efficiency and sustainability is fostering innovations in low-power components, biodegradable materials, and energy harvesting technologies. The ongoing development of 5G and the advent of 6G are also revolutionising communication, enabling ultra-low latency and massive machine-type communications for smart cities, industrial automation, and immersive experiences.

These innovations are creating a demand for diverse and specialised skill sets, giving rise to new job roles such as:

- **Embedded Systems Engineers:** Developing the hardware and software for intelligent, integrated devices.
- **IoT Solutions Architects:** Designing and implementing interconnected systems for smart environments.
- **VLSI Design Engineers:** Crafting the complex integrated circuits that power modern electronics.
- **AI and Machine Learning Engineers (with an electronics focus):** Applying AI to Optimise electronic design, manufacturing, and functionality.
- **Robotics and Automation Engineers:** Developing and deploying robotic systems for efficient production.
- **Quantum Computing Engineers:** Specialising in the development and application of quantum hardware.
- **5G/6G Network Engineers:** Designing and maintaining next-generation communication infrastructure.

- **Power Electronics Engineers:** Focusing on efficient energy conversion and management systems.
- **Sustainability and Green Electronics Specialists:** Developing environmentally friendly electronic solutions.

The future of electronics promises continued growth and unprecedented opportunities, but it necessitates a workforce that is adaptable, possesses interdisciplinary skills, and is continuously upskilling to meet the demands of this rapidly evolving field.



Dr. Neeta Nathani

Professor, Department of Electronics & Communication Engineering,
Gyan Ganga Institute of Technology and Sciences, Jabalpur, M.P.

Bringing Lessons to Life: Immersive Learning with XR

Extended Reality (XR), which encompasses Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR), is transforming the educational sphere, offering a chance to build interactive and 3D learning experiences. It enables students to experience the material at a much deeper level. Biology students are able to fly through the human body virtually, engineering students can construct devices in virtual rooms and history students can observe historical events as they unfold. XR de-clutters complicated matters, accommodates all the learning styles, and improves comprehension and memory. Among its primary benefits are the provision of real-life experiences without the associated real-world risks or expenses; medical students can practice surgery or science students can carry out experiments in virtual and safe laboratories. XR is also closing the education gap since it can present enriching learning experiences to students in remote or under-resourced locations. Devices such as Google Expeditions and Class VR are assisting schools in embracing XR, and as technology prices continue to drop, it is anticipated that their use in classrooms will increase. Nonetheless, the implications of expensive set-up, teacher training and equal access are still a challenge. These obstacles need to be overcome to realise wide-scale adoption. All in all, XR is revolutionising the education sector by making learning more immersive, inclusive, and focused on the needs of the 21st-century.



Dr. Saroj Nayyar

Assistant Professor, Faculty of Education,
Kalinga University

Forensic Reformation: Crime-Scene Investigation Transfigured by Predictive Analysis and Intelligent Imaging

Artificial Intelligence (AI) has found its way into the field of forensics, creating revolutionary potential in terms of crime detection, crime investigation, and resolution. AI-based forensic reconstruction, which utilises deep learning algorithms, 3D models, and predictive analytics to help transform the analysis and interpretation of crime scenes. Facial reconstruction of the skeletal remains can now be done with code accuracy using AI, voice pattern analysis to identify a suspect, and even behavioural prediction using psychological and digital profiling. Such developments considerably speed up the investigations and make them more reliable. Most innovative imaging solutions with AI allow building complex, interactive 3D models of crime scenes. Such virtual reconstructions enable forensic experts, police and legal teams to re-enter the scene and review it together, or even in separate geographical settings. It minimises the chances of human error and false conviction. Along with such promising aspects, the implementation of AI in forensic science also faces significant issues related to data privacy, AI bias, and the necessity to establish common legal and ethical principles as soon as possible. As AI technologies develop, they will become an essential instrument in maintaining justice and improving the accuracy of investigations and will transform the idea of forensic science in the future.



Ms. Samiksha Nayyar

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Piezoelectric Roads – Converting Traffic into Power

Imagine roads that generate electricity as vehicles drive over them. This futuristic concept is becoming a reality through piezoelectric road technology, where energy is harvested from mechanical stress using piezoelectric materials embedded beneath the road surface.

These materials produce an electric charge when pressure is applied—such as from vehicle tires. When strategically installed, they can convert vibrations and compressive force into usable electricity, which can power streetlights, traffic signals, or even feed into the grid.

What makes this innovation ground-breaking is its dual benefit: it uses existing infrastructure and transforms wasted mechanical energy into renewable power. Countries like Israel and Italy have initiated pilot projects to test this technology under real-world traffic conditions. Similarly, Japan has implemented piezoelectric flooring in crowded train stations like Tokyo and Shibuya, proving the technology's viability in high-traffic environments.

In a country like India, where vehicle density is high, piezoelectric roads could serve as micro power stations—especially in urban zones. With advancements in materials and energy storage, this innovation offers a smart, sustainable approach to city planning.

It represents a bold step toward green infrastructure, blending civil engineering, electronics, and energy systems for a cleaner future.



Mr. Anugrah Ashish Kumar

Lecturer, Department of Electrical Engineering,
GEMS Polytechnic College, Aurangabad, Bihar

Echoes of the Earth: Envisioning Tribal Wisdom for a Sustainable Future

Native tribes, so-called primitive people, are actually the keepers of the ancient knowledge and eco-friendly existence. The sense of respect towards nature leads them to a lifestyle that expresses a kind of harmony between humans and nature, which the modern world needs to rediscover. Their centuries-old experience in agriculture, herbal medicine, forest conservation and communal living can provide low-tech, low-impact solutions to the current ecological disasters. Water harvesting and natural farming are some of the practices that are eco-friendly, as well as resilient and innovative. The reconstruction of tribal wisdom does not imply romanticising poverty and remoteness, but rather the incorporation of their sustainable principles into present-day life. Their cultural richness in terms of art, music, dance and oral traditions contributes to the world's diversity, and they ought to be maintained. However, modernisation has brought about those communities to be faced with serious threats such as displacement, loss of land, as well as cultural erosion. In order to preserve and hereby empower the native cultures, we need to both respect their identity and build their heritage by means of educating and using technologies. The combination of old wisdom with recent innovations is a way to have a more ethical, inclusive, and sustainable future. The songs of tribal people are the echoes of the planet- we have to hear them and learn, or they will be gone forever.



Dr. Sanjay Yadav

Assistant Professor

Indira Gandhi National Tribal University,

Amarkantak, M.P.

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6G Communication - Future of connectivity.

As the digital age progresses, the demand for rapid, clever and more reliable communication networks is increasing. After the Global roll-out of 5G, researchers and engineers are now taking the next revolutionary jump: 6G communication is focusing on communication. It is expected to roll out by 2030, the aim of 6G is to change our way of connecting, dialoging and experiencing.

Unlike its predecessor, the 6G terahertz will work in the frequency band, which will provide 100th times faster data speed than 5G. This will enable real-time holographic video calls, fully autonomous transport and ultra-responsive smart systems. With the expectation of delays lower than 1 millisecond, this will strengthen important applications in remote surgery, industry automation and enhanced augmented reality (AR) experiences.

The 6G will also integrate Artificial Intelligence (AI) directly into the network core, making the communication system intelligent, adaptive and energy-efficient. Therefore, it is essential to provide a prospective vision of the 6G and the key enabling technologies for realising future networks.



Sneha Raghuwanshi

B.Tech Student

Electronics and Communication Department

Oriental Institute of Science and Technology, Bhopal

Quantum Simulation and Annealing

Fulfilling the value of quantum computing, quantum simulation and annealing are new methodologies in the field of affordable quantum computing that enable us to address complex problems that conventional computers cannot best. Quantum simulation is a universal quantum computer that can simulate many-particle systems. Quantum simulating makes use of principles (like superposition and entanglement) to represent and manipulate information efficiently, allowing accurate modelling of molecular structures, chemical reactions, and material properties. This ability speeds up discoveries in chemistry, material science, and drug development, as it enables insight into phenomena such as superconductivity and protein folding.

Quantum annealing is a specialised optimisation technique. Its double-value contains the ability to locate the global minimum of an objective function, through iterative changes in the parameters if a quantum system. Quantum annealing utilises quantum tunnelling to traverse intricate energy topographies, providing effective solutions for optimisation challenges in logistics, scheduling, and machine learning disciplines. D-Wave Systems was one of the early companies to demonstrate the practical utility of quantum annealing in industries. Both methods tap into the properties of quantum mechanics and give us the ability to calculate things that are impossible for classical systems. These methodologies have the potential to revolutionise a wide array of fields, from new materials and drugs to financial portfolios and cybersecurity, making quantum simulation and annealing an exciting prospect.



Vaishnavi Shendre

ECE Dept.

Faculty of Engineering and Technology Exclusively for Women,
Sharnbasva University, Kalaburagi

Mining in Blockchain

Blockchain technology is transforming the digital landscape by offering a decentralised, transparent, and tamper-proof system. At the heart of blockchain lies the mining process, where powerful computers compete to solve intricate cryptographic puzzles, validating transactions and securing the network. This complex yet efficient process is driven by cutting-edge technologies such as consensus algorithms like Proof of Work (PoW) and Proof of Stake (PoS), as well as cryptographic hashing techniques that ensure data integrity. The applications of blockchain mining extend far beyond cryptocurrency. It serves as the backbone for secure financial transactions, peer-to-peer exchanges, and digital asset management. Moreover, blockchain mining enables transparent supply chain tracking, seamless cross-border payments, and self-executing smart contracts. Industries like healthcare harness blockchain to safeguard sensitive data, while it is also being explored in governance for transparent and immutable voting systems. Mining in blockchain offers a multitude of advantages, such as heightened security, as the decentralised structure makes it virtually impossible for malicious actors to manipulate data. It also fosters trust and accountability, as each transaction is publicly recorded on an immutable ledger. By eliminating reliance on central authorities, blockchain mining promotes autonomy and democratises control, making it a cornerstone of future technological advancements.



Vajreshwari Warad

Faculty of Engineering and Technology Exclusively for Women
Sharnbasva University, Kalaburagi

Statistical Speech Processing

Statistical speech processing has revolutionised human-computer interaction, making voice-enabled technologies more efficient and user-friendly. It is a field which uses probabilistic methods, such as Hidden Markov Models (HMMs), Gaussian Mixture Models (GMMs), and neural networks, to handle the variability and uncertainty in speech. Statistical speech processing is essential for bridging the gap between humans and machines, enabling seamless communication through voice. Leveraging statistical models, it enhances accuracy, scalability, and adaptability, driving innovations in artificial intelligence, human-computer interaction, and global communication.

Statistical speech processing is very prominent for its robustness, which handles variability in accents, noise, and speaking styles effectively, and can process large datasets and adapt to new languages or dialects. It helps in reducing manual effort in designing rules or templates for speech analysis and facilitates cross-lingual communication, which is used in virtual assistants and transcription services. It also performs conversion from text to natural-sounding speech. Also detects emotions in speech for customer service or mental health monitoring. Statistical speech processing provides the facility of speaker Identification, which verifies identities in security systems and is flexible in nature, making it applicable across diverse tasks like emotion detection and language translation. Hence, this concludes that statistical speech processing plays a very immaculate role in binding both humans and machines together to improvise and modify the technology in the field of speech processing.



Shreya Venkatesh

ECE Dept.

Faculty of Engineering and Technology Exclusively for Women

Sharnbasva University, Kalaburagi

Latest Innovations in HRM: A Brief Overview

The field of Human Resource Management (HRM) is undergoing significant transformation, driven by rapid technological advancements and evolving workforce dynamics. Among the most prominent innovations is the integration of **Artificial Intelligence (AI)** in recruitment and talent acquisition. AI-driven platforms are now capable of automating resume screening, analysing candidate profiles, and conducting preliminary assessments, leading to enhanced efficiency and reduced human bias.

Another key development is the use of **People Analytics**, which involves collecting and analysing employee data to inform decisions on performance management, retention strategies, and organisational development. These insights allow HR professionals to proactively address workforce challenges and design data-informed interventions.

With the widespread adoption of hybrid and remote work models, digital solutions for **virtual onboarding, learning, and development** have become essential. Interactive platforms and AI-based learning tools are enabling personalised, scalable training experiences.

The emphasis on **employee well-being** has also led to the incorporation of wellness technologies, such as mental health apps and stress monitoring tools, into HR strategies. Furthermore, technology is facilitating stronger **Diversity, Equity, and Inclusion (DEI)** practices through digital audits, training modules, and real-time feedback mechanisms.

These innovations collectively position HR as a strategic driver of organisational resilience and competitive advantage.



Prof. (Dr.) Shikha Agrawal

Principal

Graduate School of Business

Item Sorting using IOT and MQTT

Item Sorting using IoT and MQTT is a technology-based solution that utilises Internet of Things (IoT) sensors, Message Queuing Telemetry Transport (MQTT) protocol, and cloud computing to automate and optimise the sorting process of items in various industries. Traditional sorting techniques can be slow, laborious and vulnerable to mistakes. (colour, barcode, RFID) detecting items, the MQTT protocol enabling device communication, and cloud computing, storing and processing data. Devices and actuators perform sorting actions, creating an efficient and accurate system that optimises sorting processes and improves productivity. Real-time Accident Detection Instantly detects accidents and sends alerts to emergency services. Emergency Response enables quick response and dispatch of emergency services. Industries such as manufacturing, retail, e-commerce, healthcare, automotive, aerospace, and food processing, including real-time accident detection, emergency response, traffic management, warehouse management, supply chain optimisation, inventory management, quality control, and logistics and shipping. Increased efficiency, automated sorting reduces manual labour and increases speed and accuracy. Improved Accuracy IOT sensors minimise errors, ensuring accurate sorting and reduced waste. IoT-based sorting systems can be easily scaled up or down to accommodate changing demands.

IoT-based item sorting using the MQTT protocol offers a revolutionary solution for industries seeking to optimise their sorting processes.



Sakshi

ECE Dept.

Faculty of Engineering and Technology (Exclusively for Women)

Sharnbasva University, Kalaburagi

AI in the Classroom: Transforming Education for the Future

Artificial Intelligence (AI) in education is not merely a sci-fi concept; it is a reality that is changing the way we teach and learn today. AI has the potential to completely transform the conventional classroom with intelligent tutoring programs and individualised learning pathways. There are many exciting prospects to increase student engagement, improve results, and lessen the workload for teachers when AI is implemented in educational settings. But it also brings with it difficulties that need careful consideration. In the learning environment, artificial intelligence can be used to improve professionalisation, automate repetitive tasks, give immediate feedback, and identify learning gaps. AI technologies will play an increasingly important role in classrooms as they develop. Emerging fields include emotion-sensing systems for mental health support, AI-assisted curriculum building, and predictive learning models. AI will be a potent tool for providing inclusive, equitable, and high-quality education for everyone if it is implemented carefully. Following a few steps to implement AI in the classroom can help us identify educational goals and identify challenges that AI can answer, such as increasing engagement or reducing effort. Additionally, teach teachers how to use AI effectively by equipping them with pedagogical strategies and digital literacy. Frequent workshops and training sessions are crucial for general development.



Dr. Neha Bharani

Associate Professor,
SOC, IPS ACADEMY
Indore (M.P)

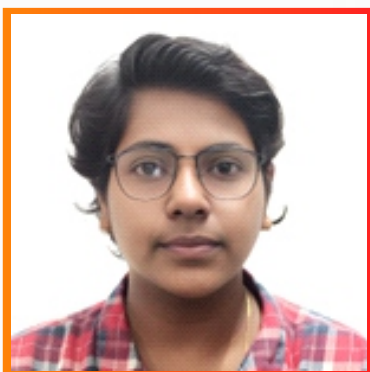
Latest Innovations in Documentation and Coding with AI

Artificial Intelligence (AI) has been a major development in coding and documentation. AI tools now help generate well-structured, correct documents with minimal human input. They employ Natural Language Processing (NLP) capabilities to recognise context, proofread grammar, and organise content effectively. ChatGPT and Grammarly are examples of tools that enable professionals to write efficiently and quickly.

In software coding, AI has transformed the way code is written. Intelligent editors like GitHub Copilot and Claude make real-time suggestions, flag errors, and even generate complete functions. This significantly boosts development speed and improves code quality. AI also simplifies testing, debugging, and translating code from one programming language to another. It proves especially useful for beginners by offering helpful suggestions and learning support.

Moreover, AI-powered documentation tools can automatically generate technical manuals, user guides, and reports by gathering and presenting information systematically. This process is efficient and helps avoid inconsistency.

These advancements greatly increase productivity while reducing the risk of human error. As AI continues to evolve, it opens up new opportunities for individuals to grow and learn. It sparks curiosity and motivates people to explore and develop new skills in a more innovative and efficient environment.



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CRISPR 3.0 and Gene Editing Therapies

CRISPR stands for clustered regularly interspaced short palindromic repeats. It refers to a natural DNA sequence found in bacteria, further adapted by scientists as a powerful gene editing tool. The latest version of CRISPR 3.0 takes things even further. Unlike other methods that cut DNA to disable or fix genes, CRISPR 3.0 use new tools like base editing, prime editing, and RNA-targeting. This allows the scientists to make tiny, precise changes to DNA or RNA, often just a single letter, without breaking the genetic code. This reduces the risk and often improves the accuracy.

CRISPR 3.0 is already being tested in clinical trials for diseases like sickle cell anaemia, beta-thalassemia, and some cancers. For example, a doctor can reprogram a patient's immune cells to better recognise and attack the tumour cells. This gene editing can happen either in vivo or ex vivo. CRISPR 3.0 may allow us to treat genetic disease before symptoms even appear. But this power also raises ethical questions, especially when it comes to editing embryos or reproductive cells. Strong global rules and oversight are essential.

It helps us to cure, changing lives through precision medicine.



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AI and Machine Learning: Revolutionising Education

The integration of Artificial Intelligence (AI) and Machine Learning (ML) into education is transforming the way we learn and teach. These technologies are enabling personalised learning experiences, automating administrative tasks, and enhancing student outcomes. AI-powered tools analyse student performance data to create tailored learning plans, ensuring that each student progresses at their own pace.

One of the most significant innovations is the development of adaptive learning platforms. These platforms use ML algorithms to adjust the difficulty and content of course materials based on individual student performance. For example, struggling students receive additional resources, while advanced learners are challenged with more complex topics.

Another breakthrough is the use of AI for automated grading and feedback. This not only reduces the workload for educators but also provides instant, data-driven insights to students. Additionally, AI-driven tutoring systems are emerging, offering one-on-one support to students outside the classroom.

However, challenges such as data privacy and equity in access to technology must be addressed to ensure inclusive implementation. As AI continues to evolve, its potential to revolutionise education is vast, promising more engaging, efficient, and personalised learning experiences for all.



Dr. Lubhawani Tripathi

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Optimising Performance: AI and the Art of Smart Sports Measurement

The future of sports is rooted in data, and Artificial Intelligence (AI) is transforming how we gather and utilise this crucial information. In training academies and professional leagues globally, **AI-driven measurement** innovations are revolutionising athletic performance. Traditionally, assessing an athlete's technique relied on coach observation; today, high-speed cameras and wearable sensors precisely measure biomechanics, force output, and even subtle fatigue indicators by analysing movement patterns invisible to the human eye.

Furthermore, integrated tracking systems provide continuous, real-time measurements of speed, acceleration, heart rate, and recovery metrics during practice and competition. AI algorithms then process these vast datasets, moving beyond simple statistics to offer actionable insights. This allows coaches and trainers to precisely measure and apply only the necessary adjustments to training regimes and recovery protocols, significantly reducing injury risk and optimising peak performance. This fusion of AI with accurate measurement technologies isn't just about efficiency; it's about building a more sustainable and productive athletic future.



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AI-Based Smart wheelchair

Artificial intelligence has transformed various aspects of our lives, and now it's revolutionising the world of assistive technology. AI-based Smart wheelchairs are designed to empower individuals with mobility impairments, providing them with independence, autonomy, and enhanced quality of life. The differently abled and/or elderly people require assistance for their movement generally; such an assistance-providing tool is a wheelchair.

AI-based smart wheelchairs use a combination of technologies. AI wheelchairs integrate advanced technologies such as computer vision, machine learning, sensor fusion, Internet of Things (IoT), GPS, software and programming, connectivity and communication and Mapping. These technologies enable the wheelchair to navigate complex environments, detect obstacles, and adapt to the user's preferences and habits. Additional features include voice control, touch interfaces, and haptic feedback, allowing users to effortlessly interact with the surroundings. Hence, the smart wheelchairs can be accessed both in manual and automatic modes. Smart wheelchairs have numerous applications like indoor and outdoor navigation, remote monitoring and smart home automation, personalised assistance and care, safety and security, rehabilitation, medical alert systems, research and development, such as algorithm development and Data collection. The AI-based smart wheelchairs also offer several advantages, including increased mobility and accessibility, health monitoring, improved safety with reduced risk of accidents, collision avoidance with people or vehicles, fall detection and alert or emergency services. It also serves to improve manoeuvrability and helps in voice or head movement control. Some smart wheelchairs use brain signals in the form of electroencephalography (EEG) signals to provide movement assistance.



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Biotechnology in the Agriculture Field

Biotechnology in agriculture involves various scientific methods to manipulate microorganisms, plants and animals to support environmental sustainability, productivity and quality of food.

Some of the methods involve genetic engineering and tissue culture, to name a few. Biotechnology works to develop either plants or plant varieties that enable them to have the mechanisms to be resistant to pests and diseases. Some examples of crops that have been genetically developed are: the Papaya varieties to resist the ring-spot virus, and the Bt Cotton and Bt Corn are sometimes also referred to as GMO (Genetically Modified Organisms). These GMO crops are meant to assist crop farmers in production, improvements on yield and crop quality, while also reducing their impacts on the environment due to their reduced pesticide application.

Biotechnology can also be used to create crops that will have greater food value due to improved nutritional content, such as Golden Rice (vitamin A), etc.

Biotechnology as a science has the opportunity to reduce pesticide and all chemical use, provides better food yield quality, and can potentially lessen some crop farmer displacement in reducing some of their input costs in competing with lower food prices and fresher food quality for the end user consumer.



Md Tawis Ansari

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3D Chiplet Integration: The Next Leap in Semiconductor Design

As technology advances, traditional chip designs face limits in power, performance, and size. A breakthrough solution is 3D chiplet integration—an innovation that stacks multiple chiplets vertically to form a compact, high-speed system.

Unlike flat 2D chiplets, 3D integrated chiplets use through-silicon vias (TSVs) and advanced packaging to create shorter interconnections, resulting in lower latency and improved energy efficiency. This vertical stacking not only saves space but also enables faster data exchange between different chiplet layers. This architecture enables combining different types of chiplets—logic, memory, and analogue—into one system, opening doors for high-performance computing, AI accelerators, and next-gen smartphones.

Leading companies like AMD, TSMC, and Intel are investing in 3D packaging technologies to overcome Moore's Law limits. By enabling heterogeneous integration, 3D chiplets reduce die size, boost modularity, and simplify design updates.

This approach not only improves performance but also supports better heat management and scalability. It is quickly becoming the standard for future VLSI systems.

For electronics engineers, mastering 3D chiplet design offers exciting research and career opportunities in the era of miniaturised, intelligent systems.



Ms. Pallavi S A

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The Exoplanet Revolution: Unveiling the world beyond our thoughts

For Numerous decades, homosapiens gazed at stars and other celestial objects and asked: **“are we alone?”** Earlier, it was just a myth which has now become a real fictional story. All credit goes to the amazing discoveries and research about the planets outside our solar system. Resulting from the new tools and desire to learn, the search for life beyond our solar system is no longer a wish.

We have discovered so many exoplanets, the first confirmed exoplanet around a sun-like star in 1995, 51 Pegasi b We have now catalogued over 5000 confirmed exoplanets, with many more to be confirmed. Various Space missions changed the vision of humanity, especially missions carried by NASA. They explained that the planets are not rare; our galaxy is surrounded by them. One of the missions, named TESS (Transiting Exoplanet Survey Satellite), continues the legacy, diligently scanning nearby bright stars for transiting exoplanets, providing a prime target for more detailed studies.

What does it all mean for us? Every new discovery brings us closer to answering that question: “are we alone?” But finding many exoplanets gives us thousands of places where life could exist. The search continues, driven by the exciting ideas that somewhere out there, another world is full of life, just waiting to be found.



Jain Krish Jesal

EEE

GEC Bhuj

Cyber Law & Data Privacy: Shielding the Digital World

In today's rapidly evolving digital landscape, Cyber Law plays a pivotal role in safeguarding individuals' rights and protecting data from unauthorised access, manipulation, or misuse. With the rise in online transactions, e-governance, and social networking, the threat to data privacy—also termed as information confidentiality—has significantly grown.

Cyber Law encompasses legal policies that govern cybercrimes, electronic contracts, and digital evidence. The Information Technology Act, 2000, serves as India's primary statute addressing these concerns. Under this law, identity theft, hacking, phishing, and data breaches are deemed criminal offences.

Data privacy refers to the individual's control over their personal information shared online. Recent reforms such as the Digital Personal Data Protection Act, 2023, have enhanced citizens' rights by ensuring transparency, consent-based data sharing, and accountability from data handlers.

In conclusion, strong cyber laws and ethical enforcement mechanisms are indispensable to fostering a secure, trustworthy, and resilient digital ecosystem. Legal professionals must stay informed and contribute actively to shaping robust frameworks that balance technological innovation with human rights protection.



Alisha

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Revolutionising Energy Distribution with Hybrid HVDC Circuit Breakers

High Voltage Direct Current (HVDC) systems are key enablers for long-distance, efficient power transmission. However, the challenge lies in quickly and safely interrupting fault currents—something traditional AC breakers cannot achieve in DC networks. Hybrid HVDC circuit breakers, combining mechanical switches with PWM-based power electronic converters, offer an innovative solution. These breakers enable fast fault isolation while minimising system losses and stress on equipment. The integration of these systems with renewable energy grids ensures not only stability but also a significant reduction in blackout risks. As the global shift toward clean and decentralised energy systems continues, such advanced switching technologies will become foundational pillars of tomorrow's smart grids.



Ibrahim Muhammad Kende

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Legal Technology & Virtual Courts

The integration of legal technology has transformed the Indian judicial system, especially during and after the COVID-19 pandemic. Virtual courts have emerged as a modern solution to reduce pendency and improve access to justice.

Under the Information Technology Act, 2000, and relevant amendments in the Civil Procedure Code and Criminal Procedure Code, e-filing, digital evidence, and video conferencing have become legally accepted tools in court proceedings.

Benefits include saving time, reducing travel costs for litigants and lawyers, and minimising delays. Virtual courts have particularly helped in traffic challan cases, bail hearings, and urgent matters. Platforms like eCourts, VIDYO, and Jitsi Meet are widely used.

Moreover, legal AI tools assist lawyers in drafting, legal research, and case management, enhancing accuracy and productivity. These innovations promote transparency and efficiency in the justice delivery system.

In conclusion, legal technology and virtual courts signify a digital leap in India's judicial landscape. With proper training and infrastructure, these tools can make justice faster, fairer, and more inclusive for all.



Tania

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Vertical Farming with AI & Robotics

Overview:

Vertical farming is an advanced agricultural technique where crops are grown in vertically stacked layers, often indoors, using **controlled environment agriculture (CEA)**. It does not rely on soil or natural sunlight—instead, it uses hydroponics (water-based nutrient systems), **LED lighting**, and **climate control systems**.

Key Technologies Involved:

1. AI (Artificial Intelligence):

- Monitors temperature, humidity, pH, and nutrient levels in real-time.
- Predicts plant diseases or nutrient deficiencies early.

2. Robotics & Automation:

- Robots are used to plant, harvest, and package crops.
- Automated conveyor systems move trays of plants between growing, inspection, and harvesting stations.
- Reduces labour cost and increases consistency.

3. IoT & Sensors:

- Sensors track every aspect of plant health

Companies: Plenty (USA), Infarm (Germany), and Aero farms.

Advantages:

- **Uses 90% less water** than traditional farming.
- **No pesticides** or herbicides needed.
- Grows crops **year-round**, regardless of climate.
- **Local production** reduces transportation costs and food waste.

Future Potential:

Vertical farming could **revolutionise food production** in megacities, deserts, and even space missions. As climate change disrupts traditional farming, vertical farms offer a **sustainable, scalable, and resilient** solution for feeding the future.



Venkatram Sravya

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Personalised Learning: AI and the Art of Smart Educational Measurement

The future of education is rooted in data, and Artificial Intelligence (AI) is transforming how we gather and utilise this crucial information. In institutions worldwide, AI-driven measurement innovations are revolutionising learning practices. Traditionally, assessing student progress relied on standardised tests; today, AI platforms precisely measure learning styles, engagement levels, and even early signs of comprehension gaps by analysing subtle interaction patterns invisible to the naked eye.

Furthermore, adaptive learning systems and educational apps provide continuous, real-time measurements of a student's performance on assignments, quiz scores, and time spent on topics. AI algorithms then process these vast datasets, moving beyond simple grades to offer actionable insights. This allows educators to precisely measure and apply only the necessary interventions and personalised learning paths, significantly reducing learning waste and optimising academic outcomes. This fusion of AI with accurate educational measurement technologies isn't just about efficiency; it's about building a more sustainable and productive learning future.



Kakisu Yau Alhassan

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AI-Powered Predictive Analytics

AI-Powered Predictive Analytics refers to the advanced use of artificial intelligence and machine learning to anticipate future trends, behaviours, or events by analysing historical and real-time data. Unlike traditional analytics, which relies heavily on static models and assumptions, AI-driven systems learn from data patterns, continuously evolve, and improve the accuracy of their predictions over time. This enables organisations to transition from reactive decision-making to a proactive, foresight-driven approach. The predictive analytics process typically begins with gathering data from multiple sources. This raw data undergoes cleaning and transformation to make it suitable for analysis. In healthcare, it helps detect early signs of illness and guides treatment choices. In retail, it supports demand forecasting and personalised marketing. The integration of tools like Natural Language Processing (NLP) further allows organisations to make use of unstructured text data, enhancing the richness and reliability of predictions. AI-powered predictive analytics is revolutionising the way data is used to shape decisions and strategies. By enabling faster, smarter, and more informed choices, it enhances operational efficiency, reduces uncertainty, and provides a competitive edge. As AI technologies become more accessible and advanced, predictive analytics will continue to transform industries and empower data-driven innovation across the globe.



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NEURAL-ML-PROSTHETICS

Neural-ML Prosthetics are changing how artificial limbs work by making them smarter and more connected to the human body. These new prosthetics use special sensors that read signals from the brain or muscles and machine learning (a type of artificial intelligence) to understand what the user wants to do- like move a hand.

Over time, the prosthetics “learns” how the person moves and thinks, making it easier and more amazing that some of the devices can send signals back to the brain, letting the user actually feel things like pressure, texture or temperature.

These high-tech limbs are already being tested in hospitals, and some patients have been able to move in ways that were impossible before. In the future, these prosthetics could even enhance human abilities beyond what's considered normal.

This powerful mix of brain science and AI is opening the door to smarter, more personalised recovery for people who've lost limbs.



ROHIT PERUA

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India's Big Success in Air Defense: Operation Sindoor

India showed great strength in air defense during *Operation Sindoor* on May 8–9, 2025. This mission was carried out after a terror attack in Pahalgam that killed 26 people. Indian forces stopped over 500 enemy drones and missiles that were sent to hit 15 military and civilian places.

Three powerful systems were used together:

- **Akash SAM** – Made in India, it can shoot targets up to 45 km away and hit four at a time.
- **MR-SAM** – Made with help from Israel, it can reach up to 100 km and is good against fighter jets, missiles, and drones.
- **S-400** – Bought from Russia, it has a long range of 400 km and can follow 300 targets and shoot 36 at the same time.

These systems were connected through India's command networks called IACCS and Akashteer. Working together, they formed a strong shield that protected all the important places.

This operation proved that India can use different air defense systems together very well. It also showed that India is now one of the leading countries in modern air defense. The success of Operation Sindoor made the world notice India's growing power and smart planning.



Priyanshu Singh

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Neuralink: When Thoughts Become Actions

Seriously, it's like something straight out of a movie, right? The idea of our brains hooking up with tech. That's pretty much the gist of what Elon Musk's Neuralink is trying to pull off with brain-computer interfaces, or BCIs. Basically, they're working on these almost invisible threads – thinner than your hair! – that could be put into the brain. These would then, like, read what your brain's up to and even send it signals. Imagine just thinking to control your phone or a robotic arm! And it's not just talk – they've actually started their first human trial, which is huge news. The upsides? Man, they could be game-changing. Helping folks with paralysis move again or talk, maybe even finding new ways to deal with stuff like memory loss or severe depression. But then you gotta wonder about the other side of the coin. Like, who's in charge of this? What happens to our private thoughts? Does it change who we are? It's super fascinating, a bit freaky maybe, but definitely something I'm keeping my eye on. Makes you think! As a computer science student, I find this intersection of biology and technology absolutely thrilling — like witnessing the future being built today.



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The Upcoming Wave of Physical AI: Transforming Industries

The technological landscape stands at a pivotal inflexion point. Physical AI, the integration of artificial intelligence with tangible systems capable of perceiving and interacting with the real world, is rapidly emerging as the next transformative frontier. This revolutionary convergence represents a fundamental shift from digital-only AI applications to embodied intelligence that can physically manipulate our environment.

Market Opportunity and Scale

The economic implications are staggering. Industry leaders project Physical AI represents a \$50 trillion market opportunity, encompassing manufacturing (\$16 trillion), construction (\$12 trillion), and logistics (\$9 trillion). This dwarfs today's entire software industry at \$700 billion, positioning Physical AI as potentially the largest industrial sector globally.

Technological Convergence

Several factors have created this tipping point. Hardware costs have dramatically decreased, making advanced robotics accessible to organisations of all sizes. Edge computing capabilities have matured, enabling sophisticated on-device processing. NVIDIA's leadership in this space, with platforms like Omniverse and Cosmos world foundation models, provides the infrastructure for creating synthetic training environments that bridge simulation and reality.

Current Applications and Innovations

The transformation is already underway. Humanoid robots from companies like Engine AI, Figure AI, and Boston Dynamics Atlas are demonstrating unprecedented dexterity and adaptability for industrial, domestic, and emergency response applications. Manufacturing giants, including Hyundai, Mercedes-Benz, and Foxconn, are implementing multi-robot fleets for material handling and assembly line optimisation.

Future Implications

Unlike traditional AI requiring human oversight, Physical AI systems operate autonomously, working continuously while improving through data and model updates. This creates a 24/7 productivity engine that extends AI's impact beyond software into every physical industry, fundamentally reshaping global labour markets and economic structures.

The upcoming wave represents more than technological advancement; it's the foundation for the next industrial revolution, where intelligent machines seamlessly integrate into our physical world, amplifying human capabilities while creating unprecedented economic opportunities across trillion-dollar industries.



Anant Gangwar

Vice-Chairperson (IEEE Computer Society)
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Plastic Waste to Road Construction: A Step Towards Sustainable Development

Plastic pollution is a growing problem in India. Every day, tons of plastic waste like bags, bottles, and wrappers are thrown away, which harms the environment and blocks drains. To solve this issue, scientists have developed a new method of using plastic waste to build roads. This process not only helps reduce plastic pollution but also makes roads stronger and more durable.

In this method, plastic waste is collected and cleaned properly. After cleaning, it is cut into small pieces and mixed with hot bitumen, the black material used in road construction. The mixture of plastic and bitumen is then spread on roads like normal construction work. The plastic helps increase the flexibility of the roads and prevents cracks and potholes, especially during heavy rain or extreme heat.

Plastic roads have many benefits. They last longer, reduce maintenance costs, and help manage plastic waste. These roads are also water-resistant, making them ideal for Indian weather conditions. Many cities in India, like Chennai, Pune, and Delhi, have already used this technology with great results. It is a low-cost, eco-friendly, and smart solution for building better roads and protecting the environment.



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SenseiBot: A Talking Robot to Teach Good Touch and Bad Touch

In today's world, teaching children about personal safety is very important. To make this learning simple and engaging, a talking robot named SenseiBot has been developed. SenseiBot is designed to help children easily understand the difference between good touch and bad touch through interactive communication.

SenseiBot responds when touched on different body parts like the head, hands, shoulders, and private areas. It plays pre-recorded voice messages to explain whether the touch is safe or not. For example, when touched on the head, it says, "Touching the head gently is a good touch." But if someone touches the private area, it immediately responds, "No one should touch here. Inform a trusted adult."

SenseiBot also uses voice guidance, simple movements, and light signals to make the learning experience more effective. Its friendly appearance and interactive responses help children feel comfortable while learning about personal safety. SenseiBot serves as a helpful companion for parents, teachers, and caregivers to educate children about body safety in a clear, memorable, and child-friendly way, promoting confidence and awareness among young learners.



Koda Aayushi Rao

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LifeSync: A Smart Solution for Modern Caregiving

LifeSync is a powerful mobile application developed to meet the growing challenges of caregiving and health management in today's fast-paced world. Tailored for working professionals, students, and families, the app simplifies the care of elderly or chronically ill individuals.

The platform features a structured medication scheduler with smart reminders and real-time alerts to prevent missed doses. It allows users to track vital health parameters like blood pressure, glucose levels, and heart rate, with clear reports and personalised insights.

LifeSync also includes a daily task manager to help organise home responsibilities, including appointments and wellness routines. With an intuitive design, voice prompts, large text, and multi-language support, the app ensures accessibility for all age groups.

By promoting adherence, supporting proactive health monitoring, and reducing caregiver stress, LifeSync empowers users to manage care effectively while maintaining their own routine. It is a reliable digital companion for those striving to balance professional life, personal health, and caregiving responsibilities.



Simpi Kumari

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Secretary of IEEE Kalinga University Student Branch

Bytes and Budgets: The Role of Financial Education in Computer Science and Engineering

As the tech world continues to expand, finance is becoming a crucial aspect of computer science and engineering. Today, engineers are not just writing code — they are helping build products, launch startups, and manage digital systems where financial knowledge plays a key role.

Finance directly affects many areas of an engineering professional's work. In startups, engineers must understand budgets, funding, and profits to help the business succeed. Even in big companies, decisions about using cloud services, software licenses, or development tools often depend on cost and financial planning. With fintech, blockchain, and AI-based financial apps on the rise, engineers are also designing systems that move and manage money — making financial acumen even more important.

Because of this growing intertwined relationship, financial education is now a necessary skill for engineers. It helps them understand salary frameworks, stock options, optimisation of project costs, and investment risks. With this knowledge, they can make better personal decisions and contribute more to their companies or startups.

In short, financial education is not just helpful — it's essential. It allows engineers to build smarter, more efficient, and financially sound solutions. As the gap between technology and finance closes, being skilled in both is a major advantage.



Piyush Srivastava

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Transparent Solar Panels

The solar energy market is witnessing transformations due to technological advancements, and one of them is the development of transparent solar panels. With innovations and new solar power technologies, they will prove to be a game-changer in the clean and renewable energy landscape. These solar panels can be deployed in windows of buildings, on mobile phones, and on laptops. This would reduce the need for large areas of land and roofs to install the panels. They replace traditional glass windows with solar panels, turning buildings into solar producers. It is believed that solar cells must absorb light to generate energy, but these panels have been built using a transparent luminescent solar concentrator. They are designed to absorb invisible wavelengths that direct energy to the edges of the panel for converting sunlight into electricity. Transparent solar panels will increase the battery life of mobile phones and laptops. Their incorporation into the windows and rooftops of vehicles will help meet a vehicle's energy requirements. They can be used in a greenhouse to allow plants to receive sunlight and generate electricity. Due to these unique abilities, transparent solar panels will fulfil a major part of the energy requirements.



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The Psychology of Self-Priority

Modern life is deeply structured around outward validations of success, relationships, and responsibilities. But it is well said that “Unless you love yourself, you cannot love anybody else.” Self-prioritising is not selfishness; it's essential psychology.

When we constantly prioritise others, we unconsciously create internal fragmentations. Emotional neglect accumulates like a silent dust, eventually results in mental fatigue and hormonal imbalances, and identity erosion. The brain under chronic stress downregulates serotonin, leading to mood instability and burnout.

Yet we continue. We serve. We suppress our emotions because society romanticises selflessness without teaching us emotional boundaries. But healing begins when you stop outsourcing your peace. No one is coming to save you. Calmness is a neurological reset, activated when we intentionally slow down, breathe, reflect, and reclaim our inner space.

The truth is, your mind is your only sanctuary. Others may support, but the inner realignment is yours alone to make. Healing is not selfish. It is self-preservation, scientifically, spiritually, and psychologically.



Tanish Kumar Karwekar

Head Designer, Anunaad
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REWRITING REALITY!

What if there is a world where your thoughts shape visuals and your body powers devices? Sounds futuristic? But not anymore.

One of the most groundbreaking innovations today is Generative AI. From text and images to music and code, generative AI tools like GPT-4 and DALL·E are transforming the way we create. Artists, marketers, developers—even students—are using AI to brainstorm ideas, build prototypes, and generate content in seconds. This blend of human creativity and machine intelligence is opening doors to faster innovation and personalised experiences across every industry.

The second marvel? Smart Wearable Tech with Energy Harvesting. These next-gen wearables not only track health metrics but also harvest energy from your body—through motion, heat, or even sweat. No more charging bands every night. Devices like self-powered fitness trackers and temperature-controlled fabrics are making healthcare more sustainable, real-time, and user-friendly.

Both these technologies signal a shift—not just in what we can do, but how we live. The future isn't waiting anymore. It's already adapting, creating, and charging—on its own. **The age of passive technology is over. The era of intuitive, intelligent, and self-sustaining tech has begun.**



Ananya Mishra

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The Human Upgrade

Imagine your mind could control machines, and machines could, in turn, heal you? No, this isn't a sci-fi plot—it's today's tech reality.

New technology emerged - Brain-Computer Interfaces (BCIs). These groundbreaking systems allow direct communication between the brain and external devices. From helping paralysed individuals move robotic limbs to enabling people to type using just their thoughts, BCIs are unlocking the true potential of the human mind. With companies like Neuralink pushing boundaries, the mind-machine merge is closer than ever.

The second innovation reshaping the future is Bioprinting. Using 3D printers, scientists are now printing human tissues—skin, cartilage, and even early-stage organs. This technology promises a revolution in medicine: no more donor shortages, faster healing, and truly personalised transplants.

Both these innovations aren't just changing lives—they're extending and enhancing them. Where technology once served, it now partners with our biology in ways once unimaginable.

From decoding thoughts to printing life, today's tech is not just smart - it's human-aware. We are no longer building machines to assist us. We're building extensions of ourselves. Tomorrow isn't arriving - it's being engineered and thought by thought.



Parth Parik

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BrahMos Missile

The BrahMos missile derives its name from the Brahmaputra River in India and the Moskva River in Russia. It is a joint venture between India's DRDO and Russia's NPOM and represents a significant milestone in global missile technology. With a current range of 290 km (extendable to 400 km) and a speed of Mach 2.8, BrahMos is a long-range, ramjet-powered supersonic cruise missile that can be launched from land, air, sea, and submarines.

Weighing 2.5 tones, the missile is equipped with advanced technologies that showcase India's growing defense capabilities. BrahMos has a two-stage propulsion system: a solid-propellant booster and a liquid-fueled ramjet engine. Its fire-and-forget capability, pinpoint accuracy, and ability to perform in complex terrains and adverse weather make it a formidable asset. The missile cannot be intercepted easily and ensures precision strikes.

India has established two defense corridors in Uttar Pradesh and Tamil Nadu to boost indigenous production. A BrahMos Aerospace Integration and Testing Facility has been inaugurated in Lucknow, further strengthening production.

The Philippines became the first international buyer of BrahMos, highlighting its global appeal. More than a weapon, BrahMos symbolises India's strategic strength and technological advancement in modern warfare.



Mrs. Sudarshini Chakure

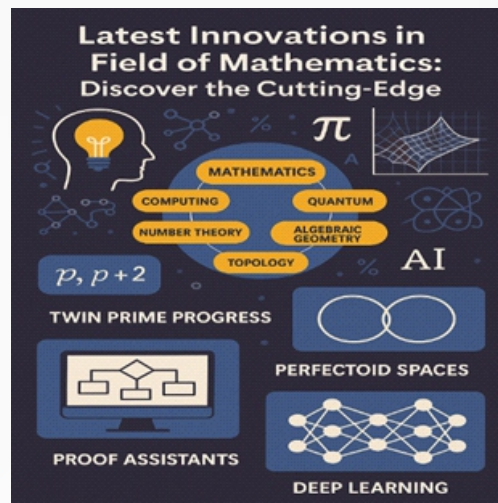
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Mathematics is The Silent Engine of Tomorrow's Breakthroughs

In a world driven by data and discovery, math is no longer limited to chalkboards; it's the beating heart of new ideas. Imagine this: Thanks to Zhang and Maynard's work on prime gaps, prime numbers can now open cryptographic vaults. What are Peter Scholze's perfectoid spaces? They connect algebraic universes and turn geometry into a tool for solving problems in more than one dimension. Now there are proof helpers like Lean and Coq that digitise rigour and get rid of human error. These tools were made by people like Kevin Buzzard. Topology is turning abstract shapes into keys for understanding quantum physics, and Jacob Rasmussen is linking knot theory to the fabric of space-time.

Field	Innovation	Contributor(s)	Application
Number Theory	Prime gaps	Zhang, Maynard	Cryptography, Number Theory
Algebraic Geometry	Perfectoid spaces	Peter Scholze	Arithmetic Geometry, Hodge Theory
AI & Optimization	Overparameterization theory	Sanjeev Arora	Deep Learning, Generalization
Topology	Khovanov homology	Jacob Rasmussen	Quantum Field Theory, Knot Theory
Logic	Proof assistants (Lean)	Kevin Buzzard	Verified Theorems, Formal Systems
Cryptography	Post-quantum systems	NIST	Secure Communication
Medicine	TDA in genomics	Gunnar Carlsson	Cancer Research, Biomedical Data
Climate Science	PDE & stochastic models	Shuckburgh, Palmer	Weather and Climate Forecasting
Finance	Lévy-based models	Fouque & others	Risk Analysis, Market Modeling

Artificial intelligence? It thrives on mathematical understanding. Sanjeev Arora's research explains why more complicated neural networks not only work, but also work better than simpler ones. And what about quantum computing? Shor's and Grover's beautiful algorithms are getting us closer to unbeatable speed and security. NIST's post-quantum cryptography makes sure we're ready for the quantum leap. arithmetic is not only fixing issues; it is also predicting the future. For example, the Langlands program uses arithmetic to figure out how the universe works, and topological data analysis is used to find cancer. Platforms like AlphaTensor and Polymath are making cooperation a creative force, and people all around the world are using tools like ArXiv, GeoGebra, and Brilliant to explore this realm.



Mathematics isn't just advancing it's awakening. It is the code that makes up the universe, the blueprint for biology, the reasoning behind AI, and the language of the most audacious questions of the future. Welcome to a time when equations not only describe the world, but also help us change it.



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CARBON SEQUESTRATION

Carbon sequestration implies the transfer of atmospheric CO₂ into other long-lived global pools, including oceanic, pedologic, biotic and geological strata, to reduce the net rate of increase in atmospheric CO₂. There are two basic methods of carbon sequestration: direct and indirect. The direct method is implemented by immediately binding carbon compounds at the source of its formation—before it enters the atmosphere. Bounded carbon is stored for a long period of time in specially designated landfills that are properly protected and environmentally friendly. The second method of sequestration—indirect—involves the use of plants that bind CO₂ in photosynthesis or when carbon compounds are bound in a soil environment. Engineering techniques of CO₂ injection in deep ocean, geological strata, old coal mines, oil wells, and saline aquifers, along with mineral carbonation of CO₂ constitute abiotic techniques. Sequestration as a function seeks to reduce net GHG emissions through the long-term storage of CO₂, achieving carbon neutrality in the case of fossil carbon storage (i.e., CCS) or negative emissions in the case of biogenic carbon (as in BECCS) or DA.



Anushka Pandey

Oriental Institute of Science and Technology
Social Media Coordinator MP SECTION

The Future of Artificial Intelligence in Healthcare

Artificial Intelligence is shaping the future of healthcare in ways we couldn't imagine a decade ago. As a student, I believe AI has the power to make healthcare smarter, faster, and more accessible for everyone.

Today, AI is helping doctors detect diseases like cancer, heart problems, and even eye disorders much earlier with more accuracy. Machines can analyse thousands of reports in seconds – something that would take humans hours. This saves lives and time.

In the future, AI will be used in robotic surgeries, personal health monitoring devices, and virtual health assistants. Imagine getting basic medical advice at home from an AI Chabot, or your smart watch warning you before a serious health issue occurs.

For countries like India, where there is a shortage of doctors in rural areas, AI can become a game-changer. It can bridge the healthcare gap and bring expert guidance to the most remote villages.

Of course, AI is not here to replace doctors - it is here to support them. If used ethically and smartly, AI can make the dream of affordable and quality healthcare a reality for all.



Anuj Kumar

B.Pharmacy Student

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AI FOR INDUSTRY 4.0

Artificial Intelligence (AI) is a cornerstone of Industry 4.0, revolutionising how industries operate by enabling smarter, data-driven decision-making. AI enhances space automation, predictive maintenance, and real-time analytics, leading to increased efficiency, reduced downtime, and improved product quality.

In manufacturing, AI-powered robots work alongside humans, learning from experience and adapting to new tasks. Predictive analytics uses machine learning to forecast equipment failures before they occur, saving costs and preventing production delays. Additionally, AI optimises supply chains by analysing vast amounts of data to predict demand, manage inventory and streamline logistics.

AI also supports quality control through computers. A vision system that detects defects with greater accuracy than human inspection. Combined with IOT devices, AI enables a connected ecosystem where machines communicate and self-optimize.



Artificial intelligence is at the heart of Industry 4.0, which marks a new era of intelligent automation and smart manufacturing. AI enables machines to learn from data, make decisions, and improve performance without direct human input. It connects with technologies like the Internet of Things (IoT), cloud computing, and big data to create highly efficient and adaptive industrial systems.



Basanti Ghanti, Pavitra Anantreddy

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COGNITIVE RADIO NETWORKS

“Smart signals make smarter connections — that's the future of wireless”

INTRODUCTION:

Today, wireless devices like mobile phones and Wi-Fi are used everywhere. These devices need radio signals to work. However, the radio spectrum is limited and sometimes gets overcrowded. Cognitive Radio Networks (CRNs) help solve this issue by using the unused parts of the spectrum smartly.



WHAT ARE COGNITIVE RADIO NETWORKS?

CRNs are systems that can sense which part of the radio signal space is free. A cognitive radio can listen to the surrounding area and find an empty space to send its data. It can also switch to another signal if the current one gets busy.

WHY ARE THEY USEFUL?

These networks help reduce problems like slow connections, call drops, and interference. CRNs are helpful in crowded places like cities, events, or during emergencies when communication is important.

CONCLUSION:

Cognitive Radio Networks are a smart solution for better wireless communication. They make sure that no signal space is wasted and that devices work smoothly even when many users are connected.



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3.	Goon Shah	Student	15.	Amit Kumar	Student
4.	Namala Mahesh	Student	16.	Bhavana Sharma	Student
5.	Vishal Raj	Student	17.	Sai Smita Sarangi	Student
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