

BNM Institute of Technology

An autonomous Institution under VTU

IEEE Signal Processing Society (SBC14831C)

List of Events Organized during 2025-26

Sl. No	Event Title	Date	No. of Participants
1	Report on EEG Awareness, Exposure and Demonstration Programme – 3 sessions	6 th , 12 th and 18 th August, 2026	25 per session
2	IEEE SPS EXECOM Meeting - Planning of Upcoming Events and Activities	1 st August, 2026	7
3	Technical Visit & Research Exposure: Advanced EEG Signal Processing and Brain Mapping at NIMHANS	28th July, 2026	5
4	Artificial Intelligence and Digital Forensics: A Much-Needed Alliance	2nd July, 2026	36
5	Faculty Interaction on Academia–Industry Synergy and Collaborative Innovation	20th June, 2026	22
6	Tech Rx HealthTech Series Webinar : Healing the Future with Digital Twins	18 th June 2026	29
7	Industry Visit – U R Rao Satellite Centre (URSC), Bengaluru	19th June, 2026	137
8	NadiCare – A HealthTech Hackathon	14th March, 2026	145

9	Industrial Workshop on Brain Signal Processing	18th, February, 2026	64
10	Annual General Body Meeting (AGM) 2026	14th, February, 2026	70
11	Idea Exchange on Neuro-technology	2nd January, 2026	5
12	Bid2Build	October 17, 2025	50
13	Inside the Network: Life of a Packet & Routing Fundamentals	25th July, 2025	120
14	EntreprenYOU: Crafting Your Startup Story in College	23rd, July, 2025	80
15	Artificial Intelligence in Drug Discovery: Bridging High-Content Screening to Target Discovery	4th July, 2025	140

IEEE SPS BNMIT Office Bearers

Sl. No	Name	Position Held
1	Harsha M S	Chair
2	Devasmitha Pathak Shrisharvari S	Vice-Chair
3	Nagaraja M Adhya Prashanth	Secretary
4	Maanya Naveen Kumar Sindhu M N	Treasurer
5	Kirtan Mohan	Webmaster

Faculty Advisor: Dr. Jyoti R Munavalli

Title of the Event: Industry Visit – U R Rao Satellite Centre (URSC), Bengaluru

Date: 19th June 2026

Time: 09:00 AM IST to 04:00 PM IST

Venue: U R Rao Satellite Centre (URSC), ISRO, Bengaluru

Organizing Unit: IEEE Signal Processing Society (SPS), B.N.M. Institute of Technology

1. Overview

An industrial visit to the U R Rao Satellite Centre (URSC), Bengaluru was organized by the IEEE Signal Processing Society (IEEE SPS) – BNMIT, in association with the Department of Electronics and Communication Engineering, as part of the SPS Day celebrations. The visit was organized for 7th semester students to provide practical exposure to India's satellite technology and space programs.

The primary objective was to help students understand the satellite development lifecycle, engineering subsystems, testing procedures, and the applications of Electronics and Communication Engineering in space technology.

2. Introduction to URSC and ISRO

The visit began with an informative session on URSC and its role in India's satellite and space programs. The centre is named after Dr. U. R. Rao, a pioneer of India's satellite program. Students were introduced to the growth of ISRO, from its early satellite missions to advanced communication, remote sensing, navigation, scientific, and planetary exploration missions.

Major milestones such as Aryabhata, Chandrayaan-1, Chandrayaan-2, and Chandrayaan-3 were discussed, highlighting India's progress in space research and technology.

3. Satellite Development and Engineering

A major focus of the visit was the satellite development lifecycle, covering mission planning, design, development, integration, testing, and launch. Experts explained the major subsystems required for satellite operation, including:

- Communication systems
- Power generation and management
- Thermal control
- Attitude and orbit control
- Payload systems
- On-board electronics and data handling
- Structural and mechanical systems

The sessions demonstrated how electronics, communication, signal processing, control systems, mechanical engineering, and computer science are integrated to develop a functional spacecraft.

4. Satellite Testing and Quality Assurance

Students were introduced to the rigorous testing and quality assurance procedures followed before a satellite is launched. The importance of clean-room environments, precision, reliability, and environmental qualification was emphasized.

The major testing procedures discussed included vibration testing, acoustic testing, thermal vacuum testing, electromagnetic compatibility testing, and environmental qualification testing. These procedures ensure that satellites can withstand the extreme conditions during launch and operation in space, where even a minor failure can affect an entire mission.

5. ISRO Missions and Space Programs

The visit also provided insights into India's ongoing and future space programs, including the Indian Data Relay Satellite System (IDRSS), Gaganyaan human spaceflight mission, and future planetary exploration programs. Students gained an understanding of the evolving role of satellite technology in communication, navigation, Earth observation, scientific research, human spaceflight, and deep-space exploration.

Documentaries on the Chandrayaan missions and satellite manufacturing process further enhanced the learning experience by providing visual insight into India's achievements in lunar exploration and spacecraft development.

6. Exhibition and Learning Outcomes

The visit concluded with a tour of the exhibition area, where students observed models of various ISRO satellites and spacecraft. The exhibits helped students relate the concepts discussed during the technical sessions to actual space missions.

The industrial visit provided valuable exposure to:

- Practical satellite design, development, integration, and testing.
- The interaction of multiple engineering subsystems in spacecraft.
- Environmental and qualification testing.
- India's achievements and future developments in space technology.
- Applications of Electronics and Communication Engineering in aerospace systems.
- The importance of reliability, precision, and quality assurance in space missions.

The experience helped bridge the gap between academic learning and real-world engineering applications, while encouraging students to explore careers and research opportunities in satellite communication, signal processing, embedded systems, aerospace engineering, and space technology.

7. Acknowledgement

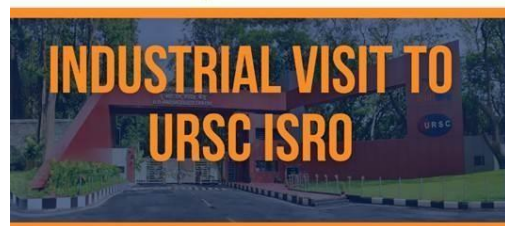
The IEEE SPS BNMIT Student Branch Chapter extends its sincere gratitude to the U R Rao Satellite Centre (URSC), Bengaluru, and the experts who provided valuable insights into satellite development, testing, and India's space programs.

The chapter also acknowledges the management and faculty of B.N.M. Institute of Technology and the Department of Electronics and Communication Engineering for their support in organizing the visit. Special appreciation is extended to the student coordinators and volunteers for their efforts in ensuring its successful execution.

8. Conclusion

The industrial visit to URSC was an enriching and insightful experience that provided students with a deeper understanding of India's space technology ecosystem. Through technical sessions, documentaries, discussions, and the exhibition tour, students learned how satellites are designed, developed, integrated, tested, and prepared for space missions.

The visit successfully connected theoretical concepts from Electronics and Communication Engineering with their practical applications in satellite technology. It also showcased India's remarkable progress in space exploration and inspired students to pursue innovation, research, and careers in advanced engineering and space technology.



An Exclusive Opportunity for VII Semester ECE Students being conducted for Signal Processing Society Day! Step into the world of space technology and innovation through an industrial visit to the U R Rao Satellite Centre (URSC), ISRO, Bengaluru.

Date: 19 June 2026

Venue: URSC, ISRO, Bengaluru

Limited Seats Available!

Register Now and be a part of an enriching learning experience at one of India's leading space research centers. Interested students should register themselves at N407.

Registration Deadline: 17-06-2026

Title of the Event: *Faculty Interaction on Academia–Industry Synergy and Collaborative Innovation*

Date: 20th June 2026

Time: 2:00 PM IST to 3:56 PM IST

Venue: Concept hall, S Block, BNMIT

Organizing Unit: IEEE Signal Processing Society (SPS), B.N.M. Institute of Technology

1. Overview

The Faculty Interaction on Academia–Industry Synergy and Collaborative Innovation was organized by the IEEE Signal Processing Society (SPS) Student Chapter, BNMIT, in association with the Department of Electronics and Communication Engineering (ECE). The session aimed to strengthen collaboration between academia and industry and create opportunities for faculty members to engage in research, innovation, consulting, and technology-driven initiatives.

The session featured Mr. Narasimha Murthy Pappu, Co-founder of XelerAIT Solutions Pvt. Ltd., who interacted with the faculty members of the ECE Department and shared insights into the newly established Academia–Industry Synergy Center at BNMIT.

2. Academia–Industry Synergy

A major focus of the interaction was the importance of developing strong and sustainable connections between academia and industry. Mr. Narasimha Murthy highlighted how collaboration among faculty members, corporates, startups, government organizations, and research institutions can help transform academic expertise into practical technological solutions.

The session emphasized that stronger industry engagement can provide opportunities for faculty and students to work on real-world challenges while enabling organizations to benefit from academic research, technical expertise, and innovation capabilities.

3. Academia–Industry Synergy Centre

The session introduced faculty members to the newly established Academia–Industry Synergy Center at BNMIT, which aims to provide a structured platform for developing meaningful partnerships between the institution and external organizations.

The centre is intended to facilitate interactions with corporates, technology companies, startups, government agencies, research organizations, industry professionals, and domain experts. Such collaborations can support research projects, technology development, consulting opportunities, internships, industry-sponsored projects, and innovation-driven initiatives.

4. Faculty Expertise and Knowledge Repository

An important aspect discussed during the interaction was the creation of a structured repository containing faculty expertise, research interests, technical skills, and capabilities. Such a repository would help organizations identify faculty members whose expertise aligns with specific technological or research requirements while enabling the institution to systematically showcase its capabilities to potential collaborators.

The proposed approach can support the identification of faculty expertise, matching industry problems with academic capabilities, formation of interdisciplinary research teams, consulting opportunities, industry-sponsored projects, and collaborative research and innovation initiatives.

5. Research, Innovation and Consulting Opportunities

The interaction provided faculty members with an opportunity to explore avenues for contributing to interdisciplinary research, innovation, and consulting activities. Collaboration with external organizations can

enable faculty members to apply their academic knowledge to practical engineering problems while gaining exposure to current industry requirements and emerging technologies.

The session also emphasized the importance of combining expertise from different engineering disciplines and industry domains to develop innovative and sustainable solutions.

6. Key Outcomes

The session provided valuable perspectives on developing a stronger institutional framework for academia–industry collaboration. The key outcomes included increased awareness of academia–industry partnerships, introduction to the Academia–Industry Synergy Centre at BNMIT, systematic documentation of faculty expertise and research interests, and identification of opportunities for collaborative research and innovation.

The interaction also encouraged faculty participation in consulting and industry-oriented projects, interdisciplinary collaboration, and the development of connections with corporates, startups, government agencies, and research organizations. These initiatives can help bridge academic research with real-world technological requirements.

7. Expert Interaction and Discussion

The session provided an engaging platform for faculty members to interact directly with Mr. Narasimha Murthy Pappu and discuss practical approaches to building successful academia–industry partnerships.

The discussion focused on effectively utilizing faculty expertise to address industry requirements and creating mutually beneficial collaborations. Faculty members were encouraged to identify areas where their research and technical capabilities could contribute to collaborative projects, innovation initiatives, and consulting opportunities.

8. Acknowledgement

The IEEE Signal Processing Society (SPS) Student Chapter, BNMIT, extends its sincere gratitude to Mr. Narasimha Murthy Pappu, Co-founder of XelerAIT Solutions Pvt. Ltd., for sharing his valuable insights and engaging with the faculty members of the ECE Department.

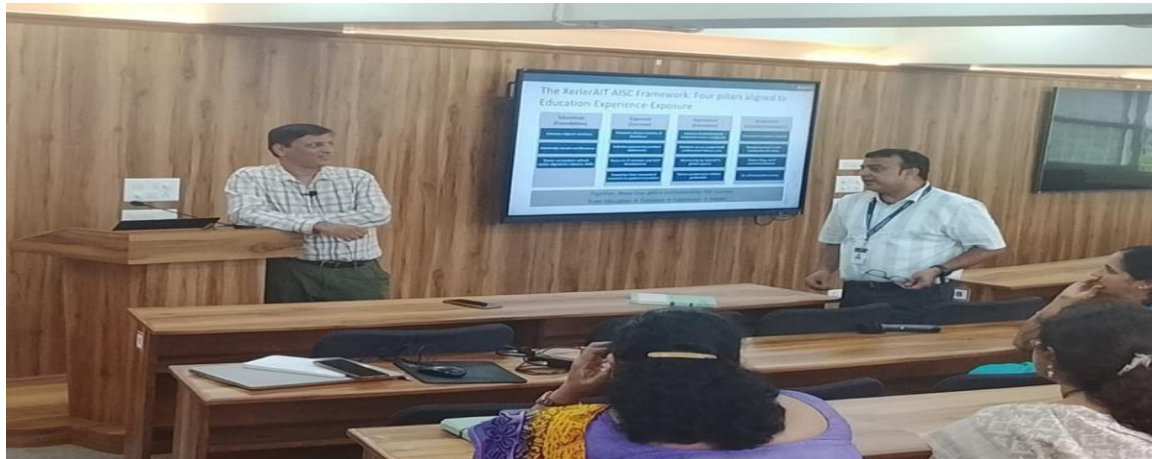
The chapter also acknowledges the Department of Electronics and Communication Engineering and the management of B.N.M. Institute of Technology for their support in organizing the interaction and promoting initiatives aimed at strengthening academia–industry collaboration.

9. Conclusion

The Faculty Interaction on Academia–Industry Synergy and Collaborative Innovation highlighted the importance of establishing stronger and more structured connections between academic institutions and industry.

The introduction of the Academia–Industry Synergy Center at BNMIT, along with the proposed repository of faculty expertise and research capabilities, provides a strong foundation for developing meaningful partnerships with corporates, startups, government agencies, and research organizations.

The session reinforced the role of IEEE SPS and the ECE Department in promoting collaborative innovation and creating opportunities where academic research, faculty expertise, and industry requirements can converge to support research, technological advancement, consulting, and real-world problem solving.





B. N. M. Institute of Technology
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IEEE Signal Processing Society (SPS-BNMIT)
 in association with
**COE-Healthcare and Smart Technology,
 Dept. of Electronics and Communication Engg.**
organizes

**Faculty Interaction on Academia-Industry
 Synergy and Collaborative Innovation**



Mr. Narasimha Murthy Rappu,
 Co-founder, XelerAIT Solutions Pvt. Ltd.

On
 20 June 2026, 2pm
 Venue: Concept Hall, S Block, BNMIT

Organizers
 Dr. Subodhkumar Panda, Prof. ECE
 Dr. Jyoti R. Munavalli, Prof, Faculty Advisor, IEEE SPS

B.N.M Institute of Technology

IEEE SPS BNMIT SBC

Report on webinar titled as: “Healing the Future with Digital Twins”

Date: 18 June 2026

Time: 7.00p.m to 7.30p.m

Venue: Online (Microsoft Teams)

Number of Students: 29

Faculty Advisor: Dr. Jyoti R Munavalli

As part of the Tech Rx – HealthTech Webinar Series, the IEEE Signal Processing Society (SPS) BNMIT Student Branch Chapter, in association with the Centre of Excellence (COE) – Healthcare and Smart Technology, ED Cell, and the Department of Electronics and Communication Engineering, BNMIT, successfully organized the inaugural webinar of the series titled "Healing the Future with Digital Twins." The session was delivered by Prof. Karanam Vasudha, Assistant Professor, Department of Electrical and Electronics Engineering, BNMIT.

The poster is for a webinar titled "Healing the Future with Digital Twins" organized by B.N.M. Institute of Technology. It features a yellow and blue color scheme. At the top, the institute's logo and name are displayed. Below this, the text "Organises TECH-Rx HEALTH TECH WEBINAR SERIES" is shown. The main title "Healing the Future with Digital Twins" is prominently displayed in the center. A dark blue banner below the title provides the date, time, and venue: "Date :18.06.2026, Time : 7.00 pm to 7.30 pm, Venue: Online". The speaker section features a circular portrait of Prof. Karanam Vasudha, an Assistant Professor in the EEE department, with the text "Join us through" and a Microsoft Teams link. The organizers section lists six faculty members from various departments. At the bottom, the poster identifies the organizing body as the Centre of Excellence - Healthcare and Smart Technology, Department of Electronics and Communication Engineering, and includes logos for BNMIT and its affiliations.

B.N.M. Institute of Technology
Organises
TECH-Rx
HEALTH TECH
WEBINAR SERIES
Healing the Future with Digital Twins
Date :18.06.2026, Time : 7.00 pm to 7.30 pm, Venue: Online

Speaker


Prof. Karanam Vasudha
Assistant Professor, EEE
Join us through
<https://teams.microsoft.com/join/19925952547897p?Q2z2aWt8ve80NwE2>

Organisers

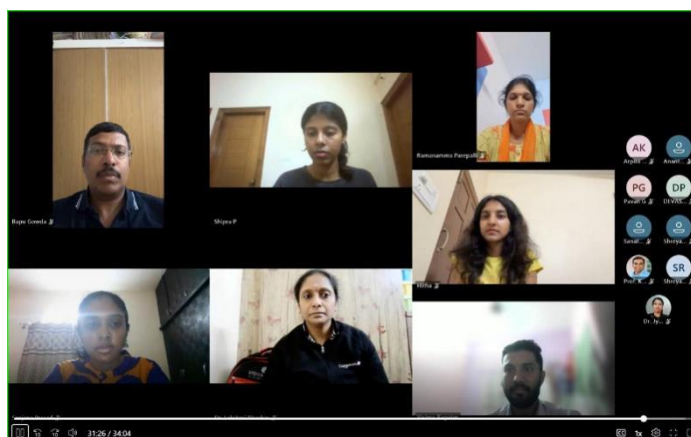
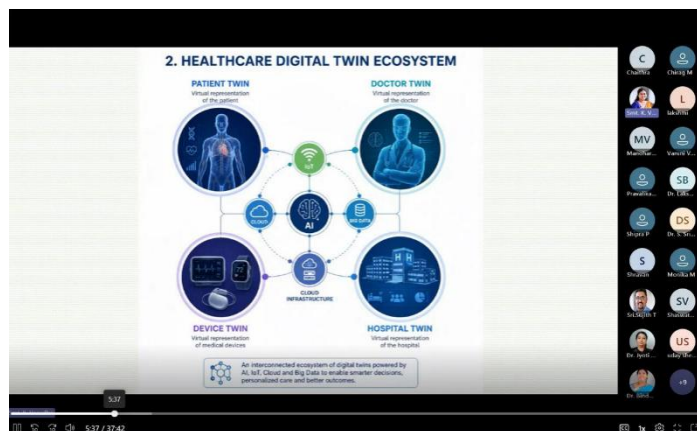
Dr. Jyoti R Munavalli Prof. & Head, ED Cell Faculty Advisor-SPS	Dr. Yashu Jyothi M. Shirur Head, Dept. of ECE Faculty Advisor-CASS	Dr. Bindu S Professor & Head - R & D Faculty Advisor-WIE & COMSOC	Dr. Lakshmi Bhaskar Associate Professor, ECE Faculty Advisor-EMBS
Prof. Sumathi A Assistant Professor, ECE ISTE Coordinator	Prof. Kiran K N Assistant Professor, ECE BC Coordinator	Prof. Arpita K Assistant Professor, ECE	

Centre of Excellence - Healthcare and Smart Technology
Department of Electronics and Communication Engineering

Tech Rx is a HealthTech webinar series launched to explore the growing convergence of healthcare and technology. The initiative aims to provide students and professionals with insights into emerging technologies such as Artificial Intelligence, Digital Health, Medical IoT, Robotics, Digital Twins, Wearable Technologies, and Data Analytics. Through expert talks, the series seeks to promote interdisciplinary learning, discuss real-world healthcare applications, highlight research and career opportunities, and inspire innovation in biomedical engineering.

The webinar focused on the concept of **Digital Twins**—virtual replicas of physical systems that enable real-time monitoring, simulation, and predictive analysis. Prof. Vasudha explained the fundamentals of Digital Twin technology and demonstrated how it is transforming modern healthcare by supporting patient monitoring, personalized treatment planning, predictive maintenance of medical equipment, and improved clinical decision-making. The session also showcased practical industry use cases, ongoing research directions, potential student projects, and emerging career opportunities in the field of digital healthcare. Despite being a concise 30-minute session, the webinar provided participants with a comprehensive introduction to one of the most promising technologies shaping the future of medicine.

The webinar witnessed the participation of **29 attendees**, who actively engaged throughout the session. The interactive discussion at the end encouraged participants to explore emerging technologies and their potential to transform healthcare delivery. As the inaugural session of the **Tech Rx HealthTech Webinar Series**, the event successfully laid the foundation for future discussions on cutting-edge healthcare technologies and inspired participants to further explore innovation in biomedical engineering and digital health.



Title of the Event: *Artificial Intelligence and Digital Forensics: A Much-Needed Alliance*

Date: 2nd July 2026

Time: 07:00 PM IST to 08:00 PM IST

Venue: Online

Organizing Unit: IEEE Signal Processing Society (SPS), B.N.M. Institute of Technology

1. Overview

Artificial Intelligence and Digital Forensics: A Much-Needed Alliance was an informative technical webinar organized by the IEEE Signal Processing Society at B. N. M. Institute of Technology on 2 July 2026 at 7:00 PM IST through Microsoft Teams. The webinar provided students with insights into the growing intersection of Artificial Intelligence (AI), signal processing, cybersecurity, and digital forensics.

The session focused on emerging technological challenges associated with the Convergence Revolution, including Genetics, Nanotechnology, Robotics (GNR), Internet of Things (IoT), and Artificial Intelligence, and their role in the fifth industrial revolution. The webinar highlighted how intelligent computational systems can support digital investigations, evidence analysis, security, and detection of manipulated digital content.

2. Expert Speaker and Technical Perspective

The session was led by Prof. Anderson Rocha, Head of the Artificial Intelligence Lab (Recod.ai) at the University of Campinas, Brazil. His expertise provided participants with valuable insights into applying AI techniques to real-world digital forensic challenges.

A key concept discussed was Humanistic AI, which emphasizes developing intelligent systems capable of interpreting external data and adapting effectively to changing environments. The speaker highlighted the importance of combining computational intelligence with human-centered approaches to address complex digital security and forensic problems.

3. Digital Forensics and Computational Investigation

The webinar introduced participants to the fundamentals of computational digital forensics and its role in modern digital investigations. Students learned about the systematic process of acquiring, validating, preserving, analyzing, and presenting digital evidence.

The session demonstrated how AI and computational methods can process large volumes of digital information and identify patterns, anomalies, and evidence that may be difficult to detect using conventional approaches.

4. AI Applications in Digital Security

A major highlight of the webinar was the discussion of practical applications of AI in digital security and forensic analysis. Participants were introduced to user-agnostic motion profiling, where accelerometer and gyroscope data from smartphones can be analyzed to identify usage patterns and determine whether a device is likely being operated by its legitimate owner.

Other applications discussed included fake news detection using neural networks, detection of manipulated images in scientific publications, person re-identification using self-supervised learning, detection of digital timestamp manipulation, and identification of sensitive or harmful digital media.

These examples demonstrated how AI can address complex and evolving digital forensic challenges beyond conventional classification tasks.

5. Artificial Intelligence and Emerging Threats

The webinar emphasized that the rapid growth of AI and connected technologies has created both opportunities and

new security challenges. The increasing volume of digital content, IoT-generated data, and AI-generated or manipulated media makes automated forensic analysis increasingly important.

Participants gained an understanding of how neural networks, self-supervised learning, sensor-data analysis, and intelligent pattern recognition can be used to identify anomalies, detect manipulation, and strengthen digital security systems. The discussion also highlighted the importance of developing responsible AI systems that maintain accuracy, adaptability, and ethical considerations in sensitive applications.

6. Key Learning Outcomes

The webinar provided students with valuable technical knowledge and practical perspectives on the convergence of AI and digital forensics. The key learning outcomes included understanding the fundamentals of computational digital forensics and the processes involved in acquiring, validating, analyzing, and presenting digital evidence.

Participants also gained knowledge of Humanistic AI, AI-based motion profiling using sensor data, neural-network approaches for fake news detection, detection of manipulated scientific images, self-supervised learning for person re-identification, digital timestamp analysis, and identification of sensitive digital media.

The session highlighted the growing importance of AI-driven forensic systems in modern cybersecurity.

7. Innovation and Real-World Relevance

A significant strength of the webinar was its focus on real-world applications of AI and digital forensics. The session demonstrated how intelligent computational systems can address practical problems involving smartphones, social media, scientific publications, digital media, and online security.

The examples helped students understand how Artificial Intelligence, machine learning, signal processing, computer vision, and cybersecurity can be integrated to develop solutions for emerging digital threats. The webinar also emphasized responsible innovation and the broader social impact of intelligent technologies.

8. Acknowledgement

The IEEE Signal Processing Society, B. N. M. Institute of Technology extends its sincere gratitude to Prof. Anderson Rocha, Head of the Artificial Intelligence Lab (Recod.ai), University of Campinas, Brazil, for sharing his expertise and providing valuable insights into the intersection of Artificial Intelligence and digital forensics.

The organizing team also acknowledges the management, faculty members, and student coordinators of B. N. M. Institute of Technology for their support in organizing the webinar and providing students with access to an international technical expert.

9. Conclusion

Artificial Intelligence and Digital Forensics: A Much-Needed Alliance provided students with an insightful overview of how AI can be integrated with digital forensic methodologies to address modern technological and security challenges.

Through expert discussions and real-world applications involving motion profiling, fake news detection, scientific image manipulation, person re-identification, timestamp analysis, and sensitive media detection, participants gained a broader understanding of the practical capabilities of AI in digital security.

The webinar highlighted the importance of interdisciplinary approaches combining AI, signal processing, cybersecurity, and digital forensics, while emphasizing the need for intelligent and human-centered technologies capable of addressing the evolving challenges of future digital systems.

IEEE Signal Processing Society BNMIT Organizes a webinar on "Artificial Intelligence and Digital Forensics: a much-needed alliance"

56:13

Take control Annotate Pop out Chat Q&A People Raise React View Apps More Camera Mic Share Leave

PROPOSED APPROACH

1 Signal preprocessing

2 Input-space transformation

3 Hybrid-image creation

4 Lightweight CNN

5 Pooling of decisions

6 Temporal coherence

same user

different user

21

Bengaluru, India

Distinguished Lecturers Program

IEEE Signal Processing Society

IEEE Signal Processing Society BNMIT Organizes a webinar on "Artificial Intelligence and Digital Forensics: a much-needed alliance"

56:13

Take control Annotate Pop out Chat Q&A People Raise React View Apps More Camera Mic Share Leave

RELIABILITY AND GENERALIZATION ASSESSMENT OF WALKING MOVEMENTS TO DESCRIBE IDENTITY TRACES

Walking movements present components able to discriminate subjects' identities
→ Research Question III

Characterization of the periodic identity components for user profiling according to their relation to gait cycle and events
→ Research Question IV

Toe off

Feet adjacent

Tibia vertical

Initial contact

Opposite toe off

Heel rise

Opposite initial contact

Toe off

Swing phase

Stance phase

2/3

DP

IEEE Signal Processing Society BNMIT Organizes a webinar on "Artificial Intelligence and Digital Forensics: a much-needed alliance"

01:10:31

Record Chat People Raise React View More Camera Mic Share Leave

29

Maanya Naveen Kumar

Dr. Lakshmi Bhaskar

Dr. Jyoti R Munavalli

Dr. Bindu S

DEVASMITA PATHAK

Anantha Padmanabham KC

Bsk Jayasudha

Bapu Gowda

AS

HS

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Report of “Technical Visit & Research Exposure: Advanced EEG Signal Processing and Brain Mapping at NIMHANS”

Title of the Event: Technical Visit & Research Exposure: Advanced EEG Signal Processing and Brain Mapping at NIMHANS

Date: 28th July 2026

Time: 11:48 AM IST to 03:00 PM IST

Venue: NIMHANS, Bengaluru

Organizing Unit: IEEE Signal Processing Society (SPS) in association with Centre of Excellence (COE), B.N.M. Institute of Technology

1. Overview

A targeted institutional technical visit was organized for a 7-member research group working under the Center of Excellence (CoE) in Neuroscience within the Department of Electronics and Communication Engineering (ECE). Accompanied and guided by Faculty Coordinator Prof. Arpita Kulkarni, the team visited the Center for Cognitive Sciences (CCS) and Centre of Brain Mapping (CBM) at NIMHANS.

The primary objective of the visit was to provide the research team with direct exposure to advanced brain signal processing methodologies, experimental research workflows, EEG instrumentation, and real-time electroencephalography (EEG) signal acquisition systems. The visit helped students connect their academic knowledge in electronics, signal processing, and neuroscience with practical clinical and research applications.

2. Academic and Research Interaction

The visit commenced with academic discussions involving NIMHANS faculty members Dr. Rahul, Dr. Arun, and Dr. Ravindra. The discussions focused on ongoing research activities, possible areas of collaboration, and the upcoming Advanced Brain Signal Processing seminar hosted by the Center for Cognitive Sciences (CCS), NIMHANS.

These interactions provided the students with an opportunity to understand current research directions in neuroscience and brain signal processing. The discussions also highlighted the importance of interdisciplinary collaboration between electronics engineering, signal processing, neuroscience, and clinical research.

3. EEG and Sleep Laboratory Exposure

The 7-member CoE team was guided by Dr. Safura Naaz through the Sleep Lab and EEG Lab, where students were introduced to both historical and modern EEG diagnostic technologies.

One of the notable highlights was the demonstration of a rare legacy analog EEG system, providing students with an opportunity to observe the evolution of EEG technology from traditional analog instrumentation to modern digital systems.

The students were also introduced to contemporary EEG equipment and recording methodologies, helping them understand how advancements in electronics and signal processing have improved the quality, accuracy, and efficiency of brain signal acquisition.

4. Centre of Brain Mapping and EEG Acquisition

The visit continued at the Centre of Brain Mapping (CBM) under the guidance of Dr. Gautam Kumar Baboo. The students were introduced to the complete hardware and software ecosystem involved in high-density EEG data acquisition.

The technical demonstration covered various components of an EEG acquisition setup, including:

- Bio-amplifiers for weak neural signal amplification.
- Signal isolation and connector units.
- Multichannel EEG acquisition systems.
- Specialized recording environments.
- EEG caps with different channel configurations.
- Subject preparation and electrode placement procedures.

Students were able to examine 32-channel, 64-channel, and 128-channel EEG caps and understand the differences

between paste-based, sponge-based, and dry-electrode technologies.

5. Live Signal Acquisition and Technical Demonstration

A major highlight of the visit was the demonstration of real-time 128-channel EEG signal acquisition. Students observed the complete subject preparation process, including electrode placement, contact-point verification, and impedance optimization.

The demonstration explained the importance of maintaining proper electrode-skin contact to reduce impedance and minimize noise in weak EEG signals. An electrolyte solution involving Potassium Chloride and baby shampoo was demonstrated as part of the electrode preparation process to achieve suitable impedance levels.

The live demonstration provided valuable insight into how physiological signals are acquired, amplified, isolated, and converted into usable digital data for subsequent processing and analysis.

6. Key Technical Learnings and Outcomes

The visit provided the research team with valuable practical knowledge related to neuroscience instrumentation and brain signal processing. Key learning outcomes included:

Experimental Design: Understanding the end-to-end workflow involved in designing brain signal acquisition experiments and clinical research studies.

EEG Signal Acquisition: Gaining practical exposure to multichannel and high-density EEG recording systems.

Impedance Optimization: Understanding the importance of electrode-skin interface management for obtaining high-quality EEG signals.

Sensor and Electrode Technologies: Comparing dry, paste/gel, and sponge-based EEG electrodes in terms of signal quality, channel density, and subject comfort.

Hardware Architecture: Understanding the roles of bio-amplifiers, connectors, isolation systems, and acquisition hardware.

Noise Reduction: Learning about controlled recording environments and techniques used to minimize interference during weak neural signal acquisition.

Real-Time Monitoring: Observing the practical workflow involved in preparing subjects and acquiring EEG signals in real time.

7. Expert Interaction and Research Collaboration

The visit provided the CoE research team with an opportunity to interact directly with experts including Dr. Rahul, Dr. Arun, Dr. Ravindra, Dr. Safura Naaz, and Dr. Gautam Kumar Baboo.

These interactions helped students gain a deeper understanding of practical challenges in neuroscience research, particularly those related to EEG acquisition, experimental design, signal quality, and instrumentation.

The discussions also created opportunities to strengthen academic and research connections between the ECE Department's Neuroscience CoE and NIMHANS, supporting future knowledge exchange and collaborative research initiatives.

8. Acknowledgements

The Center of Excellence (CoE) in Neuroscience, Department of Electronics and Communication Engineering, extends its sincere gratitude to the faculty and experts at NIMHANS, particularly Dr. Rahul, Dr. Arun, Dr. Ravindra, Dr. Safura Naaz, and Dr. Gautam Kumar Baboo, for their valuable guidance, demonstrations, and technical insights.

The team also acknowledges Prof. Arpita Kulkarni, Faculty Coordinator, for guiding the 7-member research delegation and facilitating the technical exposure. Appreciation is also extended to the Department of Electronics and Communication Engineering and B.N.M. Institute of Technology for supporting the CoE's research activities and providing students with opportunities for advanced technical learning.

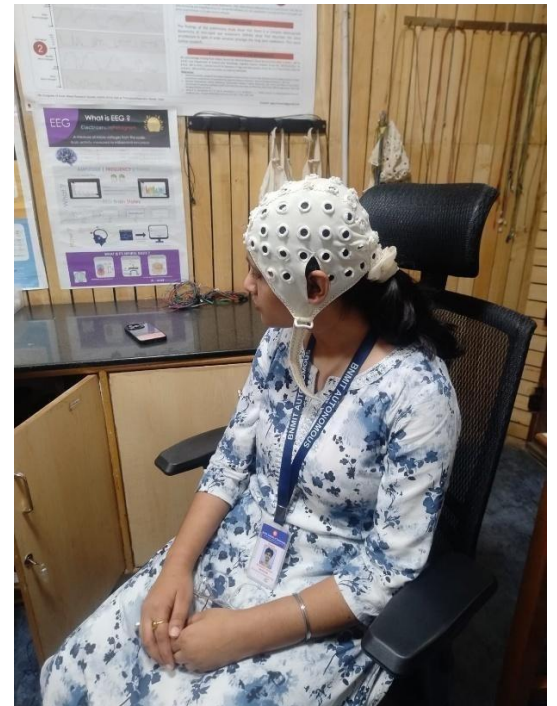
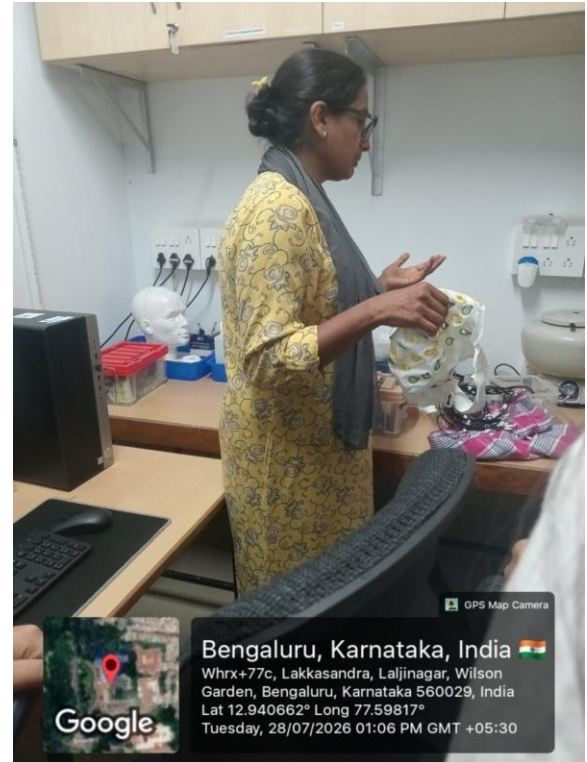
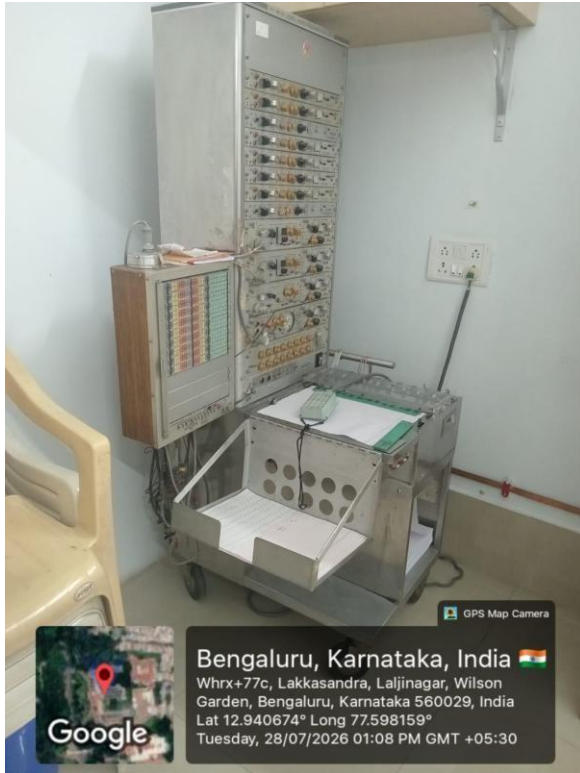
9. Conclusion

The technical visit to the Center for Cognitive Sciences (CCS) and Center of Brain Mapping (CBM), NIMHANS, provided the Neuroscience CoE research team with valuable practical exposure to modern brain signal acquisition and processing technologies.

Through laboratory demonstrations, expert interactions, and observation of real-time 128-channel EEG acquisition,

students gained a deeper understanding of EEG instrumentation, electrode technologies, impedance optimization, signal amplification, experimental design, and noise reduction.

The knowledge gained during the visit will contribute directly to strengthening the ongoing neuroscience research, brain signal processing activities, and project development within the ECE Department's CoE, while also encouraging greater interdisciplinary collaboration between electronics engineering and clinical neuroscience.



B.N.M Institute of Technology

An Autonomous Institution under VTU, Approved by AICTE

Department of Electronics & Communication Engineering

Title:	Report on EEG Awareness, Exposure and Demonstration Programme
Audience:	25, 2 nd Year Students
Date & Time:	Session 1: Three-day programme (dates not specified) Session 2: 12th Aug 2026, BNMIT New Building, Banashankari 2nd Stage, Bengaluru
Student Facilitators:	Day 1: Mrs. Arpita Kulkarni Day2: Faheemah M, Akshiita V (7th Sem) Day 3: Akanksha Sharma, Debarati Mukherjee, Devasmita Pathak

Introduction & Objective

The Department of ECE, BNMIT conducted two peer-led EEG awareness initiatives: a three-day EEG exposure programme for second-year students, and a follow-up EEG awareness activity for 2nd Semester ECE students. Both combined theory with hands-on demonstrations using the Upside Down Labs EEG kit, the Muse Headband, and interactive EEG-based games, aiming to familiarize students with brain-signal acquisition, EEG frequency bands, and applications in attention detection, neurofeedback, and human-computer interaction.

Session 1: Three-Day EEG Exposure Programme

Day 1 (Mrs. Arpita Kulkarni): Introduced EEG fundamentals and demonstrated raw EEG data acquisition using the Upside Down Labs kit electrode placement, signal acquisition, and digitization. Covered EEG frequency bands Delta (0.5–4 Hz, deep sleep), Theta (4–8 Hz, drowsiness/relaxation), Alpha (8–12 Hz, calm/eyes-closed), Beta (13–30 Hz, alertness/concentration), and Gamma (>30 Hz, higher cognitive processing) and the concept of band power, showing that raw EEG requires frequency-domain analysis for meaningful interpretation.

Day 2(Faheemah M and Akshiita V): Conducted on 12th August 2026for ~30 students of the 2nd Semester ECE class. Topics covered: What is EEG (recording brain electrical activity via scalp electrodes); Visualizing EEG Signals (real-time waveform observation and basic interpretation); Blink-Based Dino Game (using a detected eye blink to control the Chrome Dino game, illustrating signal-to-command conversion); and the Muse Headband (a wearable EEG device introduced for brain-computer interface and cognitive-state monitoring applications

Day 3 (Akanksha Sharma, Debarati Mukherjee, Devasmita Pathak): Demonstrated interactive EEG applications — the Blink Game (detecting eye-blink artifacts in the EEG signal as an input trigger) and the Focus Game (using attention-related changes in brain activity to drive an application). Facilitators also explained how to read EEG waveforms, linking signal appearance back to frequency bands and band power from Day 1.

Learning Outcomes

Across both sessions, students gained an introductory yet practical understanding of EEG — its acquisition, frequency bands, and band power — and observed how EEG signals can be visualized, processed, and converted into real-time inputs (blink detection, focus/attention detection) for interactive applications. The sessions also introduced wearable EEG devices and their role in neurotechnology and human-computer interaction, encouraging further interest in neuroscience, signal processing, and brain-computer interfaces.

Conclusion

These peer-led EEG sessions successfully bridged theory and practice, giving students across academic levels hands-on exposure to brain-signal acquisition, processing, and interactive application through student-

designed demonstrations — reinforcing the growing relevance of EEG in cognitive monitoring, neurofeedback, healthcare, and human-computer interaction.

Photograph



Title of the Event: IEEE SPS EXECOM Meeting - Planning of Upcoming Events and Activities

Date: 1 st August 2026

Time: 07:30pm IST to 08:15pm IST

Venue: Google meet

Organizing Unit: IEEE Signal Processing Society (SPS) in association with Centre of Excellence (COE), B.N.M. Institute of Technology

1. Overview

A planning and coordination meeting of the IEEE Signal Processing Society (SPS) Student Branch Chapter was conducted to discuss and organize the technical, academic, and student-oriented activities planned for the upcoming months. The meeting was initiated by Harsha, Chair of the IEEE SPS Student Branch Chapter, and was attended by the SPS office bearers along with the Chapter Advisor, Dr. Jyoti R. Munavalli.

The primary objective was to develop a structured plan for upcoming SPS activities, finalize tentative timelines, discuss event requirements, and assign responsibilities to the respective event leads.

2. Meeting Structure and Planning

The meeting focused on reviewing the proposed SPS activities and discussing the requirements for their successful execution. Key aspects discussed included event formats, technical content, resources and infrastructure, logistics, venue requirements, tentative dates, team responsibilities, execution strategies, and participant engagement.

These discussions helped the members develop a clear understanding of the preparation and coordination required for each activity.

3. Proposed Events and Activities

Several technical and student-engagement activities were discussed during the meeting. The proposed events included:

- Signal Escape Room
- EEG Game Event
- EEG Signal Processing Workshop 2
- Bid2Build 2.0
- Akashvani Visit
- Intercollege SPS Student Forum
- Symposium
- Poster Presentation

Each activity was discussed in terms of its objectives, expected participants, technical requirements, logistics, timelines, and execution plan. The proposed activities cover technical workshops, interactive learning, institutional visits, intercollegiate engagement, research communication, and academic presentations.

4. Event Coordination and Responsibilities

An important outcome of the meeting was the allocation of event leads for the respective activities. The assigned leads will be responsible for coordinating with SPS office bearers, identifying resource requirements, preparing event plans, managing logistics, and ensuring timely execution.

Tentative dates and timelines were also discussed to ensure that the activities could be organized systematically without scheduling conflicts.

5. Technical and Student Engagement

The planned activities are intended to provide students with opportunities to develop technical knowledge, practical skills, teamwork, problem-solving abilities, and research-oriented thinking.

The EEG Signal Processing Workshop and EEG Game Event aim to strengthen students' understanding of signal processing and neuroscience applications, while the Signal Escape Room and Bid2Build 2.0 are designed to promote interactive problem-solving and active participation.

The Intercollege SPS Student Forum, Symposium, and Poster Presentation will provide platforms for academic interaction, knowledge sharing, research communication, and collaboration among students.

6. Key Outcomes

The meeting resulted in a structured outline for the upcoming SPS Chapter activities. The key outcomes included reviewing the proposed events, identifying requirements, discussing tentative dates and timelines, allocating event leads and responsibilities, planning logistics and execution strategies, and developing a coordinated schedule for the upcoming months.

The meeting also emphasized increased student participation in technical and academic activities and strengthened teamwork and organizational responsibilities among the SPS office bearers.

7. Coordination and Collaboration

The meeting provided an effective platform for SPS office bearers to share ideas, suggestions, and concerns regarding the proposed activities. Collaborative discussions helped identify the practical requirements and responsibilities associated with each event.

The involvement of the Chapter Advisor, Dr. Jyoti R. Munavalli, provided valuable guidance and helped ensure that the proposed activities remained aligned with the objectives of the IEEE Signal Processing Society Student Branch Chapter.

8. Acknowledgement

The IEEE Signal Processing Society Student Branch Chapter acknowledges Harsha, Chair of the SPS Student Branch Chapter, for initiating and leading the planning meeting.

The chapter also expresses its appreciation to Dr. Jyoti R. Munavalli, Chapter Advisor, and all the SPS office bearers for their active participation, valuable suggestions, and contributions toward planning the upcoming activities.

9. Conclusion

The SPS Chapter planning meeting successfully established a clear framework for organizing the upcoming technical, academic, and student-engagement activities. Through discussions on event formats, logistics, timelines, and responsibilities, the members developed a coordinated plan for the successful execution of the proposed events.

The allocation of event leads and clarification of responsibilities will support effective coordination and timely execution. The planned activities are expected to provide students with opportunities for technical learning, practical exposure, research communication, innovation, teamwork, and intercollegiate interaction, thereby strengthening the activities and outreach of the IEEE SPS Student Branch Chapter.



Jyoti Raghavendra Munavalli

S

Sindhu M N

D

Devasmita Pathak

N

Nagaraja Setty

M

Maanya Naveen Kumar

K

Kirtan Mohan



Harsha



Report of “NadiCare – A HealthTech Hackathon”

Title of the Event: NadiCare – A HealthTech Hackathon

Date: 14th March 2026

Time: 9:00 AM – 6:00 PM IST

Venue: S-Block, BNMIT

Organizing Unit: IEEE Signal Processing Society (SPS), B.N.M. Institute of Technology

Team Size: 2–3 members per team

Prize Pool: ₹35,000

1. Overview

NadiCare – A HealthTech Hackathon was organized by the IEEE Signal Processing Society at B.N.M. Institute of Technology on 14th March 2026. The event aimed to encourage students to develop innovative and practical solutions to real-world healthcare challenges through interdisciplinary engineering.

The hackathon focused on technologies such as Artificial Intelligence, signal processing, embedded systems, and smart monitoring systems to address challenges related to healthcare accessibility, diagnostics, and patient monitoring. Participants formed teams of two to three members and worked throughout the day to design, develop, and refine their proposed solutions.

2. Event Structure

The hackathon was conducted under two primary technical tracks:

Hardware Track: Teams developed physical healthcare solutions involving embedded systems, sensors, signal processing, and smart monitoring technologies.

Software Track: Teams worked on software-based healthcare solutions using Artificial Intelligence, signal processing, data analysis, and related technologies.

The event also introduced the MedTech Innovators category to recognize interdisciplinary solutions demonstrating significant potential for healthcare applications.

3. Industry Mentorship

A major highlight of NadiCare was the involvement of industry experts and mentors who guided participating teams throughout the hackathon. Mentors from Subhanu Technologies, GTM4Health, Autoyos Pvt. Ltd., TechCrafter, SkyBrain Neurotech, Nexstem, IIHMR Bangalore, RenalyxHealth Pvt. Ltd., and S-VYASA provided technical and domain-specific guidance.

The mentorship helped participants refine their ideas, improve technical feasibility, and understand practical requirements involved in developing healthcare technologies.

4. Innovation and Evaluation

Teams worked on their solutions with a focus on addressing relevant healthcare problems and developing feasible technological approaches. The interdisciplinary nature of the event encouraged participants to combine engineering, signal processing, artificial intelligence, embedded systems, and healthcare concepts.

Outstanding solutions were recognized under three categories: Hardware, Software, and MedTech Innovators. A total prize pool of ₹35,000 was offered to encourage and recognize innovative solutions developed during the hackathon.

5. Outcomes and Impact

NadiCare provided students with valuable hands-on experience in developing technology-driven healthcare solutions in a competitive environment. The event encouraged interdisciplinary problem-solving, provided practical exposure to AI, signal processing, embedded systems, and smart monitoring technologies, and enabled students to interact with industry experts and healthcare professionals.

The hackathon also strengthened participants' skills in innovation, teamwork, prototyping, and technical presentation while encouraging the development of solutions with potential applications in diagnostics, healthcare accessibility, and patient monitoring.

6. Acknowledgement

The IEEE SPS BNMIT Student Branch Chapter extends its sincere gratitude to the participating mentors and experts from Subhanu Technologies, GTM4Health, Autoyos Pvt. Ltd., TechCrafter, SkyBrain Neurotech, Nexstem, IIHMR Bangalore, RenalyxHealth Pvt. Ltd., and S-VYASA for their valuable guidance and support.

The chapter also acknowledges the management and faculty of B.N.M. Institute of Technology for providing the necessary facilities and encouragement, along with the student coordinators, volunteers, mentors, and participants whose efforts contributed to the successful execution of the hackathon.

7. Conclusion

NadiCare – A HealthTech Hackathon successfully created a platform for students to apply engineering and technology to real-world healthcare challenges. Through its Hardware and Software tracks, industry mentorship, and recognition of MedTech innovations, the event encouraged participants to move beyond theoretical learning and develop practical solutions.

The hackathon demonstrated the potential of combining signal processing, artificial intelligence, embedded systems, and healthcare technologies to create meaningful innovations. It also provided students with valuable exposure to the interdisciplinary nature of modern HealthTech and the process of transforming technical ideas into practical solutions.





Report of “SPS 2026 Office Bearers' Virtual Meeting: IEEE SPS 2026 Planning”

Title of the Event:**SPS 2026 Office Bearers' Virtual Meeting: IEEE SPS 2026 Planning****Date:** 18th February 2026**Time:** 7:30 PM – 8:10 PM IST**Venue:** Virtual – Google Meet**Attendees:** 8 Office Bearers and Faculty Advisor

1. Overview

The IEEE SPS Student Branch Chapter at BNMIT conducted a strategic virtual meeting on 18th February 2026 to establish the roadmap for the 2026 academic year. The meeting focused on strengthening the organizational structure, increasing membership, planning technical activities, and enhancing the overall impact of the chapter.

2. Key Discussions

The meeting emphasized operational accountability, with each upcoming event assigned a designated lead responsible for its planning and execution. Strategies for increasing SPS membership were also discussed, including encouraging existing IEEE members to enroll in the IEEE Signal Processing Society.

Members were encouraged to propose new events or improvements to existing activities based on their relevance, feasibility, and potential impact. The discussion also focused on identifying individual areas of interest within Signal Processing to help plan technical activities aligned with student interests and expertise.

3. Upcoming Initiatives

The following initiatives were discussed during the meeting:

- Medical Hackathon: Planned for 14th March 2026, with members participating as organizers or competitors.
- Digital Engagement: Online technical quizzes and knowledge-sharing sessions to encourage continuous student engagement.
- Grant Utilization: Exploration of IEEE SPS global grants to support larger-scale technical and student-oriented initiatives.

4. Outcomes

The meeting established a clear focus on individual accountability, membership growth, effective event planning, and financial sustainability. The proposed initiatives aim to increase student participation, strengthen technical engagement, and enhance the overall impact of the SPS Student Branch Chapter during 2026.

5. Attendees

The meeting was attended by:

Dr. Jyoti R. Munavalli

Harsha M. S

Devasmita Pathak

Shrisharvari Satish

Adhya Prashanth

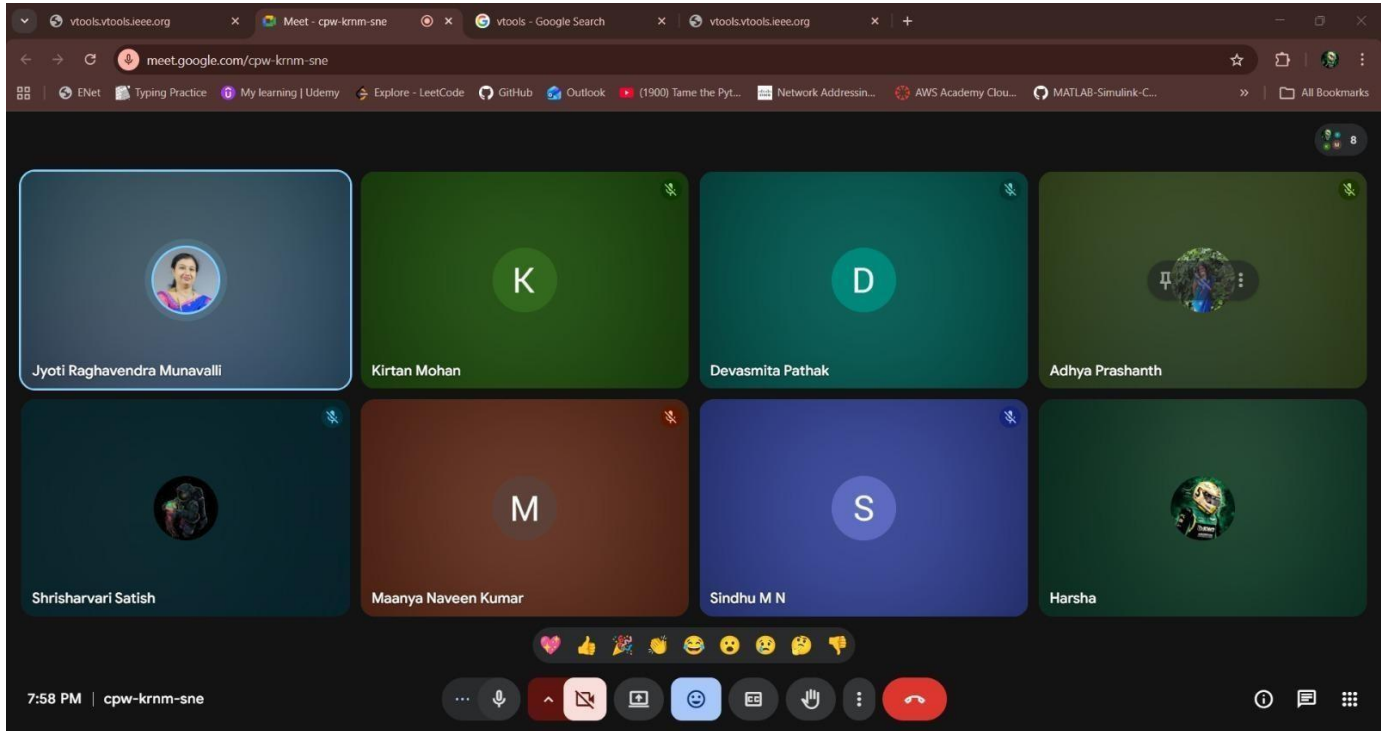
Maanya Naveen Kumar

Sindhu M. N

Kirtan Mohan

6. Conclusion

The meeting concluded with a focused roadmap for 2026, emphasizing accountable leadership, active membership engagement, impactful technical events, and effective utilization of available IEEE SPS resources. The discussions provided a structured direction for strengthening the chapter's activities and creating greater technical and professional opportunities for its members.



Report of “Industrial Workshop on Brain Signal Processing”

Title of the Event: Industrial Workshop on Brain Signal Processing

Date: 18th February 2026

Time: 9:00 AM – 4:00 PM IST

Venue: N401, BNMIT

Resource Person: Rakesh C. Jakati, CEO, SkyBrain Neurotech

1. Overview

The IEEE Signal Processing Society (SPS), in association with the Centre of Excellence in Healthcare & Smart Technologies, ECE, BNMIT, organized an “Industrial Workshop on Brain Signal Processing” on 18th February 2026. The workshop was conducted by Mr. Rakesh C. Jakati, CEO of SkyBrain Neurotech, and focused on providing students with practical, industry-oriented exposure to EEG signal processing using Python.

The workshop aimed to bridge the gap between theoretical signal processing concepts and their practical applications in biomedical and neurotechnology domains.

2. Topics Covered

The workshop covered the fundamentals and practical aspects of brain signal processing, including EEG signal processing, filtering, spectral analysis, frequency band decomposition, and visualization of brain signals using Python.

Participants were introduced to EEG signals and their applications in neuroscience and healthcare. They also learned about filtering techniques for improving signal quality, frequency-domain analysis, different EEG frequency bands and their significance, and the visualization and interpretation of brain signals. The session also provided exposure to open-source EEG datasets and neuroscience kits used for experimentation and research.

3. Hands-on Session

A major highlight of the workshop was the practical implementation of EEG signal processing techniques using Python. Participants worked with brain signal data and explored filtering, spectral analysis, frequency decomposition, and visualization techniques.

The hands-on activities helped students understand how signal processing methods can be applied to real biomedical signals and provided practical exposure to tools and datasets relevant to neurotechnology research.

4. Outcomes and Impact

The workshop provided participants with practical knowledge of EEG signal processing and its applications in healthcare and neurotechnology. It helped students strengthen their understanding of biomedical signal processing, gain hands-on experience with Python-based EEG analysis, and understand the practical challenges involved in processing brain signals.

The session also encouraged students to explore research and career opportunities in neurotechnology and brain-computer interfaces while connecting classroom concepts with real-world industry applications.

5. Acknowledgement

The IEEE SPS BNMIT Student Branch Chapter extends its sincere gratitude to Mr. Rakesh C. Jakati, CEO of SkyBrain Neurotech, for conducting the informative and hands-on workshop.

The chapter also acknowledges the Centre of Excellence in Healthcare & Smart Technologies, ECE, BNMIT, for its

support and collaboration in organizing the event.

6. Conclusion

The Industrial Workshop on Brain Signal Processing successfully provided students with a practical understanding of EEG signal processing and its applications in biomedical technology. By combining theoretical concepts with hands-on implementation, the workshop served as a valuable learning experience for students interested in neurotechnology, brain-computer interfaces, and healthcare signal processing.



Report of “Annual General Body Meeting (AGM) 2026”

Title of the Event: Annual General Body Meeting (AGM) 2026

Date: 14th February 2026

Time: 2:00 PM – 3:15 PM IST

Venue: N401 Seminar Hall, BNMIT

1. Overview

The Annual General Body Meeting (AGM) of the IEEE Student Chapter, BNMIT was successfully conducted on 14th February 2026 at N401 Seminar Hall. The event was graced by Director T. J. Ramamurthy, Additional Director and Principal Dr. S. Y. Kulkarni, and Deputy Director Dr. Krishnamurthy.

The IEEE SPS BNMIT Student Branch Chapter presented a review of 12 events conducted during 2025, highlighting its focus on technical excellence, industry readiness, and practical learning.

2. Key Highlights

The chapter conducted several technical and student-oriented activities during 2025. Major highlights included the MATLAB Signal Processing Hackathon with 137 participants and Bid2Build 2025 with 50 participants.

Technical workshops covered topics such as AI/ML for VLSI and Network Routing Fundamentals. Expert sessions focused on areas including neurotechnology, AI in drug discovery with 140 participants, and startup mentorship.

Healthcare-oriented sessions addressed topics such as ocular assessment and dry eye diagnosis. Operational activities included vTools workshops and EXECOM sessions, with the chapter maintaining 100% reporting compliance.

3. Planned Activities for 2026

The chapter presented its roadmap for 2026, including the following activities:

- March: Biomedical Signal Processing Hackathon
- June: SPS Day Celebration with Technical Quiz
- October: Bid2Build 2.0
- December: Industrial Visit to ISRO

The planned activities aim to provide students with opportunities for technical learning, practical exposure, innovation, and industry interaction.

4. Office Bearer Transition

The 2025 SPS Office Bearers were honored for their contributions and efforts toward the successful execution of the chapter's activities. The 2026 SPS Office Bearers were subsequently announced, marking the transition to the new leadership team.

5. Conclusion

The AGM provided an opportunity to review the achievements of the IEEE SPS Student Branch Chapter during 2025 and establish its strategic direction for 2026. The meeting concluded with a clear roadmap for continued

technical, professional, and industry-oriented activities, along with a smooth transition to the new leadership team..





IEEE SPS BNMIT OFFICE BEARERS 2026

 Dr. Jyoti R Munavalli Faculty Advisor	 Harsha M S Chair	 Devasmita Pathak Vice Chair
 Shrisharvari S Vice Chair	 Adhya Prashanth Secretary	 Nagaraja M Secretary
 Maanya Naveen Kumar Treasurer	 Sindhu M N Treasurer	 Kirtan Mohan Webmaster

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Report of “Idea Exchange on Neuro-technology”

Title of the Event: Idea Exchange on Neuro-technology

Date: 2nd January 2026

Venue: N407, BNMIT

Time: 10:00 AM IST onwards

1. Overview

The IEEE Signal Processing Society (SPS-BNMIT), in association with the Centre of Excellence (COE) – Healthcare and Smart Technology, organized an “Idea Exchange on Neurotechnology” on 2nd January 2026. The session provided a platform for students, researchers, and technology enthusiasts to explore emerging developments and research opportunities in the field of neurotechnology.

2. Key Highlights

The session focused on Brain-Computer Interfaces (BCIs) and neural signal processing, along with recent advancements and emerging research areas in neurotechnology. Participants gained insights into the applications of signal processing in neuroscience and smart healthcare.

The interactive discussions encouraged the exchange of ideas and highlighted the importance of interdisciplinary collaboration in developing innovative solutions for healthcare and neurotechnology.

3. Outcomes

The session encouraged participants to explore research opportunities in neurotechnology and understand its potential applications in healthcare, neuroscience, and signal processing. It also helped participants gain awareness of emerging technologies and their scope for future innovation.

4. Conclusion

The Idea Exchange on Neurotechnology provided an engaging platform for discussing emerging trends, applications, and research possibilities in the field. The session encouraged students and participants to explore interdisciplinary approaches and pursue innovation in neurotechnology, neuroscience, and smart healthcare field.



Report of “Artificial Intelligence in Drug Discovery”

Title of the Event:

Artificial Intelligence in Drug Discovery: Bridging High-Content Screening to Target Discovery

Date: 4th July, 2025

Time: 11:30 am to 1pm

Venue: Room A215, BNMIT Campus

Participants: 140

Organized by:

Department of Electronics and Communication Engineering,

B.N.M. Institute of Technology (Autonomous), Bengaluru

In association with IEEE Signal Processing Society – BNMIT Student Branch Chapter

and IEEE Engineering in Medicine & Biology Society (EMBS) – BNMIT Student Branch Chapter

Objective of the Event:

The primary aim of this technical talk was to:

- Highlight the pivotal role of research in accelerating innovation within the field of Artificial Intelligence.
- Inspire students and professionals to contribute actively to AI-driven biomedical research, especially in drug discovery.

The Department of Electronics and Communication Engineering at B.N.M. Institute of Technology, in collaboration with the IEEE Signal Processing Society and the IEEE Engineering in Medicine & Biology Society (EMBS) student chapters, organized a technical talk titled “*Artificial Intelligence in Drug Discovery: Bridging High-Content Screening to Target Discovery*” on 4th July 2025. Delivered by Prof. Arvind Rao from the University of Michigan, the session highlighted how AI is transforming the landscape of biomedical research by enabling the conversion of microscopy images into quantifiable data, analyzing cellular responses to compounds, and bridging screening results with target identification. The talk offered students and faculty valuable insights into the future of AI-driven innovation in drug discovery and the practical challenges of integrating these tools into research workflows.

Artificial Intelligence is revolutionizing drug discovery by transforming complex microscopy images into quantifiable data through deep learning techniques, enabling precise analysis of cellular structures and behaviors. Once this data is extracted, AI models can assess how cells respond to various pharmaceutical compounds, identifying subtle phenotypic changes and predicting therapeutic outcomes. Furthermore, AI aids in connecting high-content screening results to target identification and validation by uncovering correlations between compound effects and molecular pathways. Despite its promise, integrating AI into research workflows presents challenges such as data variability, model interpretability, and the need for high-quality labeled datasets. Looking ahead, AI is poised to drive the future of drug discovery by accelerating research timelines, reducing development costs, and enabling personalized medicine through predictive and adaptive modeling.



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IEEE BNMIT Student Branch

Meeting Report for IEEE Google Meet Discussion

Date: 17th July 2025

Platform: Google Meet

Meeting Highlights:

The IEEE BNMIT execom members met online today to plan and discuss upcoming activities. The session focused on sharing ideas for events over the academic year, potential collaborations, and organizational tasks.

During the meeting, it was discussed that there is going to be an interactive session featuring two student entrepreneurs on 23rd July. The objective of this event is to provide IEEE members with insights into student-led ventures and entrepreneurship.

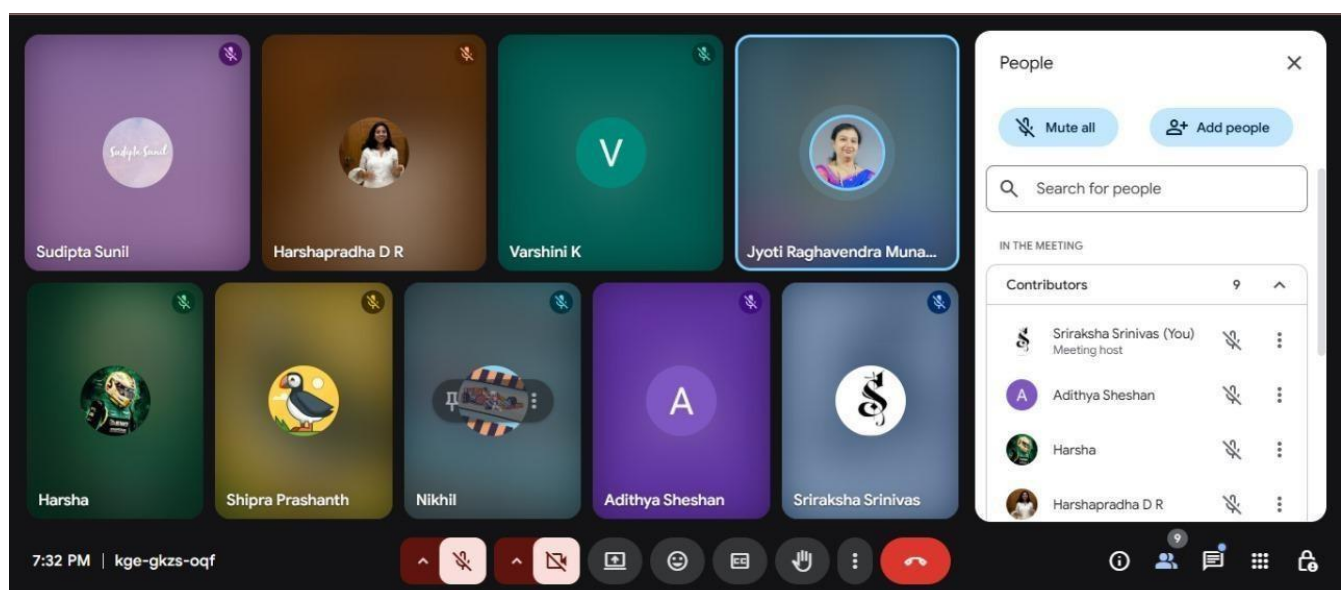
A felicitation program is scheduled for 26th July 2025 to recognize and honor senior IEEE members for their contributions. This event will also serve as a farewell to the outgoing office bearers, acknowledging their dedicated efforts and service to the IEEE BNMIT Student Branch. As part of the program, the outgoing members will interact with the current team, sharing their experiences, insights, and tips to help guide the next set of office bearers in their roles.

The team discussed arranging two educational visits aimed at giving members real-world industry exposure. One of the proposed visits is to Hassan Mission Control Facility, where students would get an opportunity to learn about satellite operations and how mission control centers function. A visit to Akaashvani (All India Radio) is also being planned, offering members a chance to understand the workings of radio broadcasting from a technical and operational perspective. Both visits are planned with the objective of broadening students practical understanding beyond classroom learning.

It was also discussed that EMBS and SPS would collaborate on events focusing on healthcare technology, biomedical applications, and signal processing in medical systems. The collaboration aims to organize joint workshops, webinars, and technical sessions that align with the interests of both societies.

The meeting was hosted by Harshapradha D.R., Chair of the IEEE SPS Student Branch, and Sriraksha Srinivas, Chair of the IEEE EMBS Student Branch, in the presence of the faculty advisor Dr. Jyoti R. Munavalli ma'am. The office bearers present in the meeting were Adithya M Sheshan, Harsha M S, Nikhil Patil, Shipra Prashant, Varshini K, and Sudipta Sunil.

The meeting ended on a positive note, with clear plans laid out for the upcoming activities and collaborations.



IEEE BNMIT EMBS and SPS Office Bearers' Online Meeting held on 17th July 2025.

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- **Event Name:** *EntreprenYOU: Crafting Your Startup Story in College*
- **Organized by:** IEEE Signal Processing Society & IEEE EMBS Student Chapters, BNMIT
- **Supported by:** Institution's Innovation Council (IIC), Entrepreneurship Development Cell – BNMIT, IEEE BNMIT Student Branch
- **Date & Time:** 23rd July 2025 | 12:00 PM – 1:30 PM
- **Venue:** N401, BNMIT
- **Total Participants:** 80 students

Objective Of The Event:

The purpose of this session was simple but powerful: to show us that we don't need to wait until graduation to start building something meaningful. The event focused on how our college life—filled with ideas, curiosity, and energy—is actually the perfect time to start a venture. Whether it's a simple problem we notice around us or an idea we can't get out of our heads, this session was all about turning that into action.

Event Summary:

The event “*EntreprenYOU*” was designed to motivate students to explore entrepreneurship during their college years. It featured young founders who started their journeys while still in college, sharing real stories of how they turned simple ideas into impactful ventures.

An inspiring Speaker was invited:

- **Mr. Rana Vivek Singh** (Co-Founder & CEO, Magicroll.ai) shared his experience of building AI products as a student, and how starting small helped him scale his idea into a company.

The speaker emphasized how college can be the best time to start up when students have access to resources, peer collaboration, and freedom to experiment. His journeys encouraged attendees to believe in their ideas, take risks, and think beyond academics.

The session also had an engaging Q&A, where students asked questions about starting up, finding co-founders, facing failures, and approaching investors.

During the Q&A, Mr. Singh addressed practical challenges students often face when thinking about startups like how to find co-founders, validating your idea, balancing academics with building something on the side, and understanding the mindset needed when pitching to investors. His honest responses and practical suggestions resonated deeply with the audience. The event ended on a high note, leaving students energized and inspired.

Key Takeaways:

- Start where you are. No idea is too small.
- Use college resources and networks to experiment and build.
- Solving real problems can lead to impactful startups.
- It's okay to fail what matters is learning and growing.

Photos from the event:



Event Title: Inside the Network: Life of a Packet & Routing Fundamentals

Organizing Unit: IEEE Signal Processing Society (SPS) Student Branch Chapter, BNM Institute of Technology (BNMIT), Bengaluru

Event Type: Technical Workshop

Date: 25th July 2025

Time: 11:00 AM – 3:00 PM IST

Venue: Room A215, B.N.M. Institute of Technology, Bengaluru

Number of Participants: 120 students

Resource Person:

Ms. Sanyukta S. Pawaskar

Technical Consulting Engineer, Cisco Systems

Overview of the Workshop

The IEEE Signal Processing Society (SPS) Student Branch Chapter of BNMIT successfully organized a hands-on technical workshop titled “*Inside the Network: Life of a Packet & Routing Fundamentals*” on 25th July 2025. The session was conducted by Ms. Sanyukta S. Pawaskar, Technical Consulting Engineer at Cisco Systems, who provided deep industry insights and practical expertise to participants.

The workshop aimed to strengthen students’ understanding of networking through a blend of theoretical learning and practical demonstration, bridging the gap between classroom concepts and real-world applications.

Topics Covered

- **TCP/IP Model:** Overview of the four layers :- Application (HTTP), Transport (TCP/UDP), Internet (IP), and Link (Ethernet/Wi-Fi).
- **Switching vs. Routing:** Explained Layer 2 (MAC-based switching within LANs) and Layer 3 (IP-based routing across networks).
- **IPv4 Addressing:** 32-bit format, structure, and importance of subnetting and network identification.
- **MAC Address:** Unique hardware identifiers used in Layer 2 frame forwarding.
- **Address Resolution Protocol (ARP):** Mapping IP addresses to MAC addresses for local communication.
- **Ping Utility:** Demonstrated ICMP-based connectivity and latency testing for network diagnostics.

Hands-on Session

A key highlight of the workshop was the Command Line Interface (CLI)-based lab session, where students configured routers and switches, assigned IP addresses, and implemented static routing. These practical exercises helped participants gain a real-world understanding of packet flow within a network. The interactive Q&A session that followed allowed students to clarify concepts, discuss troubleshooting methods, and connect theoretical knowledge with industry use cases.

Outcomes and Impact

- Enhanced understanding of **core networking concepts** and their real-world applications.
- Strengthened **technical and analytical skills** through guided practical exercises.
- Introduced students to **industry-relevant tools** and Cisco-level configuration environments.
- Encouraged interest in **network engineering and communication systems** among participants.

Acknowledgements

The IEEE SPS BNMIT Student Branch Chapter extends its sincere gratitude to **Ms. Sanyukta S. Pawaskar** for delivering an informative and interactive session. Special thanks to **Dr. Jyoti R. Munavalli**, Faculty Advisor, for her mentorship and continuous support. The Chapter also acknowledges the **management and faculty of BNMIT** for their encouragement and facilities, and appreciates the **student coordinators and volunteers** for their dedicated efforts in organizing the event successfully.

Conclusion

The workshop, *“Inside the Network: Life of a Packet & Routing Fundamentals,”* provided students with a comprehensive understanding of how data travels within networks — from packet generation to routing decisions. By combining theory and practice, the event effectively enhanced participants’ technical proficiency and interest in networking technologies. The IEEE SPS BNMIT Student Branch Chapter looks forward to hosting more such impactful technical sessions to foster learning, innovation, and professional growth among students.

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Department of Electronics and Communication Engineering

IEEE Signal Processing Society
In Association with
IEEE Women In Engineering & IIC

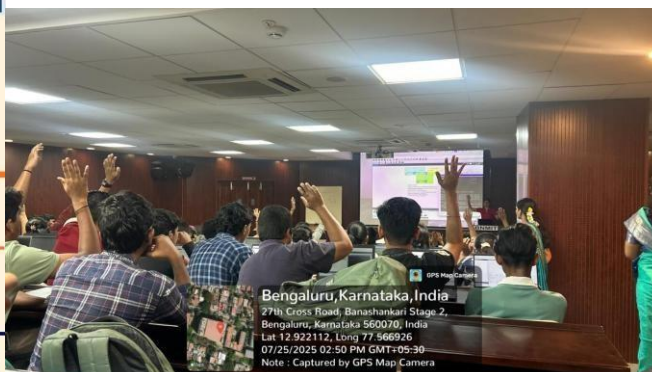
Organizes a Workshop on
“Inside the Network: Life of a Packet & Routing Fundamentals”

Date: 25.07.2025
Time: 11.00am
Venue: A215

Sanyukta S. Pawaskar
Technical Consulting Engineer, Cisco
Joint-Secretary, IEEE WIE AG
Bangalore Section

Organizers

Dr. Jyoti R. Munavalli Head, ED Cell, BNMIT Faculty Advisor-SPS	Dr. Yasha Jyothi M Shirur Professor & IISD
Dr. Vyanda Kusanur Associate Professor, ECE	Dr. Bindu S Faculty Advisor-WIE, ComSec
Sri. Narayan Rao R. Maanay Chairman, GB BNMIT	Prof. T. J. Rama Murthy Director BNMIT
Prof. Eishwar N. Maanay Dean BNMIT	Dr. S. Y. Kulkarni Additional Director & Principal BNMIT
	Dr. Krishnamurthy G. N. Deputy Director BNMIT



Why you should be a Tech CEO & Decoding the Brain: Foundations of designing Neurotech

Organized by ED Cell and IEEE SPS BNMIT

8th October 2025

Duration: 11:15 am – 1:00 pm

No of participants: 60



First Speaker: Dr. Soumya Bhattacharjee

Topic: “Why you should be a Tech CEO”

Dr. Soumya Bhattacharjee Head of Research and Data at Nexstem delivered a compelling presentation challenging the traditional academic career path and advocating for scientist-entrepreneurs as drivers of technological innovation. His systematic approach deconstructed conventional academic models while building a strong case for tech entrepreneurship.

The Academic Status Quo: A Historical Engine

For decades, the academic path often summarized as PhD PostDoc Faculty—was the principal driver of groundbreaking science.

Academic Superstars: Real-world examples include Nobel Prize winners like Hodgkin and Huxley (computational neuroscience) and David Baltimore (biotechnology), who built their careers within institutions. Why it Worked Historically: The model was effective before the 1970s because universities provided the only access to expensive resources (like supercomputers), intellectual freedom, stability (tenure), and network effects for top talent, as venture capital for risky tech was non-existent.

The Reality of Modern Academia

The traditional model is now burdened with major obstacles that stifle innovation and creativity:

- **Financial Scarcity:** A huge funding crunch means low success rates for grants (e.g., only 20% for NIH grants), leading to poor wealth creation for faculty.

- Bureaucracy and Red Tape: Academics often spend 50% of their time on administration and grant writing, resulting in "long road, dead creativity" as peak innovation years are consumed by the 10-15 year climb to a faculty position.
- Political Vulnerability: Research can be highly susceptible to political interference and government budget cuts.

The Rise of the Tech CEO Model

The presentation advocates for a return to the historical model where scientific pioneers found their own funding, scaled up, and executed their vision outside of formal institutions.

- History Repeats: Historically, figures like Thomas Edison (Menlo Park, funded by telegraph profits) and Marie Curie (relied on private donors) were financially independent.
- The Modern Catalyst (SpaceX Model): Companies like SpaceX, Kernel, and Neuralink demonstrate that profound scientific and technical challenges can be solved efficiently outside of academia, driven by a powerful economic incentive to create wealth and pursue moonshot goals.
- VC as the New Grant Funding: Venture Capital firms are now flush with money and have pressure to invest in high-risk, high-reward ventures, offering the potential for 100x returns in early-stage startups.
- Holistic Growth: The role of a Tech CEO expands intellect beyond a single domain, requiring skills in Business Strategy, Negotiation, Market Forces, Team Building, and Public Speaking, making it "More Fun" and multi-dimensional.

Steps for founding a company

The presentation concludes with a simple pathway for those looking to transition to a Tech CEO role: 1.Find a Co-founder ,2.Ideate,3.Market Validate,4. Business Model,5.Business Pitch

Second Speaker: Dr. Aditya Asopa

Topic: "Decoding the Brain: Foundations of designing Neurotech"

Dr. Aditya Asopa, Research Scientist at Nexstem, Bengaluru, provided comprehensive technical exploration of neurotechnology fundamentals. His presentation demonstrated practical applications of the entrepreneurial mindset advocated by Dr. Bhattacharjee within neuroscience domains, making complex brain-computer interface concepts accessible to undergraduate students while highlighting enormous business opportunities.

The Paradox of Scale and Practical Applications

The C. elegans Paradox: Despite knowing all 302 neurons' functions, electrical behavior, and connections in the tiny nematode worm, scientists can "only barely" predict worm behavior. This illustrates the complexity gap between component understanding and system behavior, highlighting challenges in morphology, ion channels electrophysiology connectome, and network activity.

Practical Success Despite Complexity: Contrasting this complexity, reading just 1000 neurons (0.0000003% of human brain) enables robot control and video game interaction. Real-world examples include Utah arrays and Neuralink's N1 implants, proving complete system understanding isn't necessary for practical applications and commercial success.

Bio signal Technologies and Market Applications

Current Technologies with Commercial Potential:

- EEG (Brainwave activity): BCI applications, sleep monitoring, neurofeedback - massive consumer device market
- ECG (Heart rhythm): Fitness tracking, medical monitoring - established wearable technology market
- EMG (Muscle activity): Prosthetics, rehabilitation - healthcare and assistive technology markets
- PPG (Blood volume): Pulse monitoring, SpO2, fitness tracking - massive consumer adoption potential
- GSR/EDA (Skin conductance): Emotion detection, stress monitoring - wellness and mental health applications
- NIRS (Cortical oxygenation): Cognitive load measurement - research and clinical applications

- IMU (Motion/position): Gait analysis, tremor detection, fatigue monitoring - movement disorder applications

Three Engineering Challenges as Business Opportunities

Challenge A - Sensor Development: Current brain recording resembles "concert hall of billions of neurons" where scientists hear either few individuals clearly or entire hall bustling. Market opportunity exists for companies developing smaller, more sensitive sensors capable of brain-depth recording, advancing from Hans Berger's 1929-1938 EEG observations to modern personalized medicine applications.

Challenge B - The Decoding Revolution: Despite abundant data availability, signal translation remains problematic with unclear mapping between EEG signals and cognition, uncertain neural code patterns. Nexstem exemplifies commercial success, discovering better ways to translate EEG signals into actionable brain states: sleep, focus, decision-making, and cognitive load for enterprise and consumer applications.

Challenge C – The Interface to the mind: Currently "one-way street where reading is easy, writing is hard." Optogenetics works for few neurons but not large areas; TMS affects large areas but lacks precision. Future progression toward brain-computer symbiosis where machines learn, understand, and adapt to individual users represents the ultimate market opportunity.

Engineering Stack and Future Market Timeline

Entrepreneurial Opportunities Across Technology Layers:

- Application Layer: UX design, consumer games, VR experiences, therapy applications
- Intelligence Layer: AI algorithms, machine learning platforms, signal processing solutions
- Systems Layer: Real-time operating systems, portable high-fidelity processing devices
- Hardware Layer: Advanced sensors, amplifiers, biocompatible materials, compact circuits
- Wetware Layer: Experimental protocols, surgical technologies, non-invasive interfaces

Market Timeline and Convergence Opportunity: This represents a "special time" due to neuroscience-AI convergence, electronics advancement, data availability, and computing power enhancement.

Future Market Projections:

- 2030: Closed-loop depression treatment systems
- 2035: Thought-controlled exoskeleton markets for paralyzed patients
- 2040: Direct brain-to-brain communication platforms
- 2050: Mainstream cognitive enhancement becoming commonplace
- 20XX: Human-AI merger and complete integration markets

Q&A Session

The technical talk concluded with an interactive question and answer session, where participants engaged the speakers with thoughtful and diverse queries. Dr. Bhattacharya and Dr. Asopa addressed a range of questions from students and faculty, providing deeper insights into entrepreneurship, transitions from academia to industry, neural engineering, commercialization of neurotechnology, and practical steps for pursuing innovation. Their responses clarified complex topics, inspired future research, and highlighted challenges and opportunities in neurotechnology and technology entrepreneurship.

Conclusion and Future Implications

This comprehensive technical talk successfully demonstrated the powerful synergy between scientific expertise and entrepreneurial execution. Dr. Bhattacharjee's advocacy for scientist-entrepreneurs provided the essential motivational and strategic framework, while Dr. Asopa's technical presentation showcased concrete opportunities within neurotechnology, creating a complete roadmap for student career development.

The central insight emerged that technical expertise combined with entrepreneurial thinking represents the optimal path for driving scientific and technological innovation in the modern economy. Students departed with practical frameworks for both technical development and business execution, positioned to contribute meaningfully to the transformation of scientific research through entrepreneurial applications. The convergence of neuroscience, artificial intelligence, and entrepreneurial opportunity represents a unique historical moment for technically-trained leaders to drive unprecedented innovation and economic impact.

Event Title: Bid2Build

Organizing Unit: IEEE Signal Processing Society (SPS) Student Branch Chapter, BNM Institute of Technology (BNMIT), Bengaluru

Event Type: Technical Workshop / Hackathon

Date: October 17, 2025

Time: 9:00 AM - 5:00 PM IST

Venue: Main Seminar Hall, BNM Institute of Technology, Bengaluru

Target Audience: Undergraduate engineering students from all branches.

Number of Participants: 50 students

1. Abstract

Bid2Build 2025 was a flagship hackathon organized by the IEEE SPS Student Branch Chapter at BNMIT as a key event during IEEE Week. The event was uniquely designed to merge strategic resource management with technical innovation. Participants engaged in a competitive bidding process to acquire electronic components before building and demonstrating functional prototypes. This event successfully created a dynamic environment that challenged students to balance budget constraints with technical ambition, fostering critical thinking, on-the-spot problem-solving, and collaborative teamwork.

2. Event Objectives

The primary objectives of Bid2Build 2025 were:

- To foster innovation: Encourage students to develop creative solutions to real-world problems.
- To develop strategic thinking: Introduce participants to resource management and strategic planning through a component bidding system.
- To enhance technical skills: Provide a hands-on platform for students to apply their knowledge in electronics, coding, and system integration.
- To promote teamwork and collaboration: Facilitate a competitive yet collaborative environment where students work in teams to achieve a common goal.
- To simulate real-world engineering challenges: Mirror the industry scenario where projects are constrained by budgets and available resources.

3. Event Proceedings

The event was structured into four main phases, executed over a single day:

1. Inauguration and Briefing (9:00 AM - 9:30 AM): The event began with an inauguration ceremony. Dr. Jyoti R. Munavalli, Faculty Advisor, delivered the opening remarks, highlighting the importance of practical skills in engineering. The coordinators then explained the rules, objectives, and the unique bidding format to all participating teams.
2. The Bidding Session (9:30 AM - 10:30 AM): Each team was allocated a fixed number of virtual points. A list of available components (microcontrollers, sensors, motors, displays, etc.) was presented, and an auction was conducted. Teams had to strategically bid for the components they needed for their project, forcing them to prioritize and make critical decisions before the building phase even began.
3. The Buildathon (10:30 AM - 3:30 PM): With their acquired components, teams entered the five-hour building phase. They worked on developing their prototypes, ranging from IoT-based home automation systems to signal processing applications and robotic arms. Volunteers and coordinators were present to provide technical assistance and ensure a smooth workflow.
4. Project Demonstration and Judging (3:30 PM - 4:30 PM): Teams presented their completed prototypes to a panel of judges. Each presentation included a demonstration and a Q&A session. Projects were evaluated based on innovation, technical complexity, completion, and the efficiency of component usage.

5. Valedictory and Prize Distribution (4:30 PM - 5:00 PM): The event concluded with the announcement of the winners. Dr. Munavalli congratulated all participants for their enthusiastic involvement and presented awards to the winning teams, officially closing the event.

4. Outcomes and Impact

Bid2Build 2025 was a resounding success, achieving its intended objectives.

- **Skill Development:** Participants gained invaluable hands-on experience in rapid prototyping, circuit design, and programming under pressure. The bidding process significantly sharpened their strategic planning and resource allocation skills.
- **Participant Feedback:** Feedback from students was overwhelmingly positive. They appreciated the innovative format, which distinguished it from a traditional hackathon and added a thrilling layer of strategy.
- **Innovation Showcase:** The event successfully showcased the technical prowess and creative potential of the students, with several high-quality prototypes being developed within the limited timeframe.

5. Acknowledgements

We extend our heartfelt gratitude to our Faculty Advisor, Dr. Jyoti R. Munavalli, for her unwavering support and guidance throughout the planning and execution of this event. We also thank the management and faculty of BNMIT for providing the necessary facilities and encouragement. Finally, this event would not have been possible without the dedicated efforts of our student volunteers, coordinators, and the enthusiastic participation of all the teams.

6. Conclusion

Bid2Build 2025 successfully created a platform for young innovators to push their boundaries. It stands as a testament to the success of activity-based learning in engineering education. The IEEE SPS BNMIT Student Branch Chapter looks forward to organizing more such impactful events in the future to continue fostering a culture of innovation and excellence.



