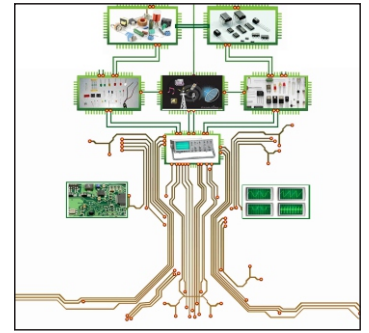


ELECTRONICA

Newsletter

Department of Electronics & Communication Engineering



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Vision and Mission of the Institute

- Vision**
- To be one of the premier Institutes of Engineering and Management education in the country
- Mission**
- To provide Engineering and Management education that meets the needs of human resources in the country
 - To develop leadership qualities, team spirit and concern for environment in students
- Objectives**
- To achieve educational goals as stated in the vision through the mission statements which depicts the distinctive characteristics of the Institution
 - To make teaching-learning process an enjoyable pursuit for the students and teachers

Vision and Mission of the Department

- Vision**
- To be a renowned department for education in Electronics and Communication Engineering in Karnataka State, moulding students into professional engineers
- Mission**
- To provide teaching - learning process in Electronics and Communication Engineering that will make students competitive and innovative to adapt to needs of industry and higher learning
 - To imbibe professional ethics, team spirit and leadership qualities to succeed in changing technological world
 - To inculcate empathy for societal needs and concern for environment in engineering design and practice
- Program Education Objectives**
- After 2 to 3 years of graduation, the students will have the ability to:
- Analyze, design and implement solutions in Electronics and Communication Engineering and adapt to changes in technology by self/continuous learning
 - Engage in higher learning and contribute to technological innovations
 - Work with professional ethics as an individual or as a team player to realize the goals of the project or the organization
 - Work with respect for societal values and concern for environment in implementing engineering solutions



This edition of *Electronica* is dedicated to **David Baker, Demis Hassabis, and John Jumper** who were jointly awarded the 2024 Nobel Prize in Chemistry. The Nobel Prize in Chemistry, 2024 is about proteins, life's ingenious chemical tools. David Baker has succeeded with the almost impossible feat of building entirely new kinds of proteins. Demis Hassabis and John Jumper have developed an AI model to solve a 50-year-old problem: predicting proteins' complex structures. These discoveries hold enormous potential.

What's inside...

- *About the Department*
- *Technical Articles*
- *Staff Achievements*
- *Student Achievements*
- *Departmental Events*

And more...

B. N. M. Institute of Technology

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Vidyayamruthamashnuthe



FROM THE EDITORS' DESK

"The important thing is not to stop questioning. Curiosity has its own reason for existing."

– Albert Einstein

Dear Readers,

Welcome to yet another exciting edition of *Electronica*! As you hold this newsletter in your hands or scroll through it digitally, we invite you on a journey through innovation, discovery, and groundbreaking ideas that define the ever-evolving world of *Electronics and Communication Engineering*.

What drives technological advancement? Is it knowledge? Passion? Or the relentless curiosity to push beyond limits? In these pages, you will find thought-provoking articles, emerging research, and insightful perspectives from students and faculty who dare to ask bold questions and seek transformative answers. From the latest trends in electronics to inspiring academic achievements, this edition is a testament to our department's unwavering commitment to exploration and excellence. But this is not just a compilation of facts and events—it is a reflection of our collective pursuit of knowledge. Each article, each achievement, and each idea are a stepping stone toward a future where technology continues to redefine possibilities. To all our contributors—your dedication fuels this initiative, and we extend our deepest gratitude. To our readers—you are the reason *Electronica* thrives. Your curiosity, engagement, and passion for learning inspire us to bring forth editions that inform, challenge, and spark new ideas.

So, go ahead, turn the page, explore, question, and discover, because within these pages lies a world waiting to unfold.

Happy Reading!



Editorial Team

ABOUT THE DEPARTMENT

The Department of Electronics & Communication Engineering, established in 2001, admits 120 UG students (plus 12 lateral entry) and 12 PG students specializing in VLSI and Embedded Systems annually. The department boasts highly qualified faculty with an average of sixteen years of experience, including alumni from premier institutes like IITs and professionals with rich industry exposure. The department provides a vibrant academic environment, enabling students to achieve distinctions, high pass percentages, and excellent placements in reputed companies such as National Instruments, Nokia, Siemens, and IT giants like TCS, Infosys, and Wipro. Its autonomous syllabus emphasizes practical learning, project-based teaching, and research, preparing students for MS programs in top international universities. The department organizes international IEEE conferences, workshops, and seminars, ensuring continuous learning through professional bodies like IEEE, ISTE, and IEI. Students benefit from technical skill development programs, internships, and industrial visits that enhance their industry readiness. Soft skills and personality development classes are conducted to support students' holistic growth. Over the years, students have secured 24 university ranks (18 UG, 6 PG) and Eleven gold medals, reflecting their outstanding academic performance. The department has established 12 industry MOUs such as Samsung, CISCO, Qualcomm Academy, GTTC etc., Centers of Excellence in Healthcare and Smart Technologies, and fosters innovative lab projects and internships at reputed institutions. Students actively participate in technical, cultural, and sports events, bringing accolades to the department and enriching their overall experience.

Dr. Yasha Jyothi M Shirur
Professor & Head, Dept. of ECE

TECHNICAL ARTICLES

6G Networks: Are You Ready for the Next Big Leap?

Have you ever wondered what comes after 5G? What if your internet was so fast you could download a movie in the blink of an eye? What if holographic video calls became as common as texting? That's the world 6G is set to create—a future where speed, intelligence, and connectivity blend seamlessly to reshape our lives. Welcome to 6G—a world where speed meets imagination and connectivity knows no limits!



What would you do with internet speeds 100 times faster than 5G? 6G isn't just about faster downloads; it's about unlocking a new realm of possibilities. Think of virtual worlds so immersive you'll feel like you're living in them, or cars that communicate flawlessly to keep roads safer. Powered by AI, 6G networks will learn and adapt to your needs in real time, ensuring the best possible connection everywhere.

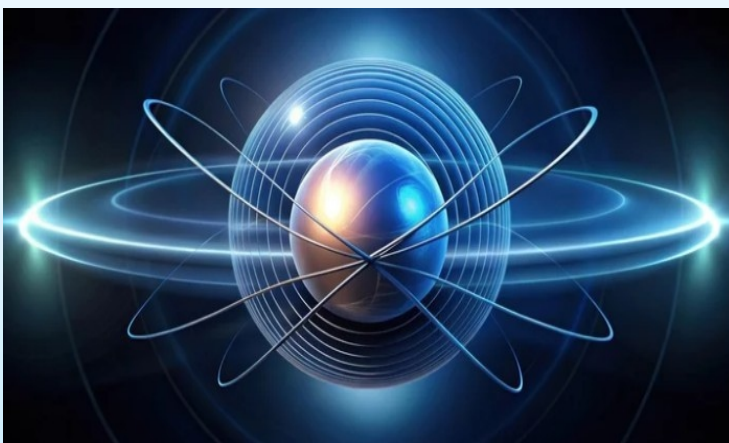
6G won't just connect devices—it'll connect entire experiences. Imagine a smart city where every streetlight, vehicle, and building works together to make traffic flow smoother, save energy, and keep everything safer. Picture attending a remote class or seeing a doctor where it feels like they're right there with you, no matter how far away you are. With 6G, artificial intelligence, blockchain, and IoT will come together like never before, creating possibilities we can only dream of today. It's not just about the faster internet; it's the foundation of a future already knocking at the door.

But can we overcome the challenges? Terahertz frequencies, energy efficiency, and global standards are tough obstacles to tackle. Yet, the excitement around 6G continues to grow. Are we ready for a world where connectivity is limitless? With a predicted launch around 2030, the clock is ticking. What part of this future excites you the most?

The future isn't calling—it's holographically arriving; are you ready to answer?

Monisha R
1BG22EC058

The Spin Chronicles: Unveiling the Quantum Secrets Shaping the Future of Electronics



As technology advances at an unprecedented pace, the demand for faster, smaller, and more energy-efficient devices continues to grow. Enter Spintronics, a groundbreaking field of electronics that has the potential to redefine how we process and store information. By utilizing the quantum property of electrons—known as spin—along with their charge, spintronics unlocks new data storage and computation frontiers.

What is Spintronics?

Spintronics, short for spin electronics, is a technology that exploits the spin of electrons to carry and process information. Traditional electronics depend on an electron's charge, but spintronics adds an additional layer of functionality by using the two spin states of electrons: "spin-up" and "spin-down."

This innovation allows spintronic devices to perform tasks more efficiently, with increased speed and significantly reduced energy consumption. One of the most promising applications of spintronics is the development of Magnetoresistive Random Access Memory (MRAM), which could revolutionize the way computers store data by providing faster, more reliable, and energy-efficient memory.

Why Spintronics Matters:

The electronics industry is facing significant challenges as traditional semiconductor technologies reach their physical and functional limits. Spintronics offers solutions that address these challenges. Spintronic devices offer several transformative benefits for modern technology. They consume significantly less power, reducing both energy costs and heat generation, making them highly energy efficient. Their faster data processing capabilities enable high-performance computing and real-time analytics, addressing the growing need for speed in data-driven applications. Unlike traditional memory, spintronic memory is non-volatile, retaining information even when power is lost, ensuring data persistence and reliability. Furthermore, spin-based devices can be manufactured at the nanoscale, meeting the increasing demand for smaller and more compact technological solutions.

The Road Ahead

Spintronics is still a developing field, but its potential impact is undeniable. As research progresses, we can expect spintronics to play a pivotal role in shaping the future of electronics, offering sustainable and scalable solutions for industries ranging from consumer electronics to aerospace.

"Spintronics isn't just about rethinking technology—it's about reshaping the very foundation of electronics for a smarter and more efficient future."

Shriparna Praveenkumar Hegde
1BG22EC100

Google's Quantum Chips: Pioneering the Future of Computing



In the ever-evolving world of computing, quantum technology stands at the forefront of innovation, promising to revolutionize industries from cryptography to artificial intelligence. Google, a key player in this field, has been making significant strides in quantum computing, particularly with its quantum chips. These advanced processors leverage the principles of quantum mechanics to perform calculations far beyond the reach of classical computers.

In 2019, Google made headlines by claiming quantum supremacy with its Sycamore processor. This 54-qubit quantum chip was able to perform a complex computation in 200 seconds—a task that would take the world's most powerful supercomputer thousands of years. This milestone demonstrated the potential of quantum chips to solve problems that are practically impossible for traditional computers.

Quantum chips operate based on qubits, the quantum equivalent of classical bits. Unlike conventional bits, which exist in either 0 or 1 states, qubits can exist in superposition—meaning they can represent both 0 and 1 simultaneously. Additionally, qubits exhibit entanglement, a phenomenon where the state of one qubit is dependent on the state of another, allowing for exponentially faster computations.

Google's quantum chips use superconducting circuits to create and manipulate qubits. These circuits are cooled to near absolute zero to maintain quantum coherence, a delicate state required for effective quantum operations.

Despite Google's breakthrough, quantum computing is still in its infancy. One of the biggest challenges is quantum error correction. Qubits are highly sensitive to external disturbances, leading to errors in calculations. Google is actively working on developing error-corrected quantum processors, which would enable reliable and scalable quantum computing.

Another hurdle is increasing qubit count and connectivity. While Sycamore has 54 qubits, practical quantum computing requires thousands or even millions of stable qubits. Google's latest efforts focus on scaling up its quantum processors while improving their performance and stability.

Building on its previous successes, Google introduced the 105-qubit Willow chip, a more advanced quantum

processor aimed at tackling more complex computational problems. The Willow chip is a significant step toward fault-tolerant quantum computing, as it incorporates improved qubit coherence and error correction techniques. With its increased qubit count, Willow represents a crucial advancement in scaling quantum hardware for practical applications.

Willow has improved on earlier generations of Google's quantum chips in several ways. For starters, the use of tunable qubits and couplers in Willow has provided it with much faster gates and operations that help achieve lower error rates. This speed also allows hardware to be optimized or adjusted during operation. Variances in superconducting qubits can sometimes create high error rates, but tuners allow nonconforming qubits to be reconfigured and aligned with other qubits to eliminate errors.

The advancements in Google's quantum chips have vast implications across multiple domains. Quantum computing could revolutionize materials science by simulating complex molecular structures, leading to breakthroughs in drug discovery and energy storage. It could also enhance artificial intelligence, enabling machines to solve problems with unprecedented efficiency.

Google's quantum chips mark a significant step toward a future where quantum computing transforms industries and reshapes technology. While challenges remain, ongoing research and innovation promise to unlock the full potential of quantum computing, bringing us closer to a new era of computational power.

Maanya Naveen Kumar
1BG23EC055

The Rise of Digital Twins: Revolutionizing Industries through Virtual Replicas

The digital twin has recently become a transformational force across manufacturing, healthcare, and urban planning. A digital twin is a virtual replica of a physical system, process, or product that allows for real-time monitoring, analysis, and optimization. This innovative technology is reshaping how organizations operate, enabling them to enhance efficiency, reduce costs, and improve decision-making.

Digital Twins in Manufacturing

Digital twins are revolutionizing the production process in the manufacturing sector. Companies can simulate operations, identify bottlenecks, and optimize workflows with a virtual model of a manufacturing system. General Electric (GE) uses digital twins to monitor the performance of its jet engines. GE analyzes data from sensors embedded in the engines to predict maintenance needs, thereby reducing downtime and improving reliability. This proactive approach is not only a great means to improve operational efficiency but also extend the equipment life.

Healthcare Revolution

Digital twin technology is also revolutionizing the healthcare industry. By creating digital replicas of patients, health providers can simulate the treatment plan and predict outcomes. The approach of this type will lead to better diagnosis and tailor-made therapies. For instance, digital twins of organs are being designed by researchers to allow surgeons to practice complex procedures in a virtual environment before attempting them on actual patients. The technology improves the precision of surgical procedures and minimizes risks for better patient outcomes.

Urban Planning and Smart Cities

Digital twins are used in urban planning to create smart cities. They model the whole urban environment for analysing traffic, energy consumption, and environmental impact. By the data-driven methods, resource distribution in infrastructure development can be planned more precisely. For example, Singapore recently began using the digital twin of the city to optimize the design of cities for sustainability. With the help of simulation analysis of various scenarios, planners can figure out what strategy would best work for managing urban growth and elevating the quality Of life of residents.

Digital twins are revolutionizing industries with better insights, enhancing operational efficiency. Its further applications are exponentially increasing as technology is being gradually adopted by several companies. Digital twins open this new era from manufacturing to urban planning and now in healthcare through innovation and optimizing processes. The future will be supported forward with integration in every sphere of life, improving processes as well as more intelligent and environmentally friendly solutions along with the betterment of society altogether. For sure, it will have bright prospects for digital twins, considerably changing the economy of the whole world.

Chinmayi G
1BG23EC021

DEPARTMENTAL EVENTS

Workshop on "Computing Algorithms for Geoscience and Satellite Remote Sensing Data Analysis"

The Department of Electronics and Communication Engineering at BNMIT, in association with IEEE-BSB, organized a workshop on "Computing Algorithms for Geoscience and Satellite Remote Sensing Data Analysis" on 5th July 2024. This event was part of the IEEE GRSS (Geoscience and Remote Sensing Society) launch at BNMIT.



The workshop featured distinguished speakers, including Dr. John Mathew (Associate Director, EDPO, ISRO HQ Bangalore), Dr. Narayan Panigrahi (Group Director and Scientist-G, CAIR, DRDO Bangalore), Dr. Shyam Lal (Associate Professor, NITK Surathkal), and Dr. Saroj Kumar Meher (Associate Professor, ISI-Bangalore Centre). The sessions covered topics such as Earth Observation Systems, GIS applications, AI-based computing algorithms, and machine learning techniques for remote sensing data analysis. With 100 participants, the workshop provided hands-on insights into modern computational tools for geoscience applications, enhancing students' knowledge and research opportunities.

Poster Presentation Competition on "Digital Health"

On 8th July 2024, the IEEE BNMIT SB EMBS and IEEE BNMIT SB WIE societies, in association with the Centre of Excellence in Medical Healthcare, BNMIT, organized a Poster Presentation Competition on "Digital Health."



The event had participation from seventeen teams and was attended by forty students. Participants showcased innovative ideas and research on advancements in digital healthcare technologies through well-designed posters. The competition was judged by Dr. Allen, an expert in the field, and was further graced by the presence of Dr. S.Y. Kulkarni (Principal, BNMIT), Prof. Eishwar N. Maanay (Dean, BNMIT), and Dr. Krishnamurthy G.N. (Deputy Director, BNMIT). The event encouraged discussion on challenges and opportunities in digital health, and the best posters were recognized based on creativity, technical content, and presentation skills.

Invited Talk on "Feminine Wellness"

On 26th July 2024, the IEEE Women in Engineering (WIE) Affinity Group at BNMIT organized an invited talk on "Feminine Wellness", featuring Mrs. Keerthi Jain, Founder of Sustainable Stree. The session was attended by sixty students and faculty members.



Mrs. Jain shared valuable insights into women's health across different life stages, emphasizing sustainable and risk-free feminine care solutions. The session highlighted the importance of making informed choices for long-term well-being and promoted eco-friendly alternatives to conventional hygiene products. Organized under the mentorship of Dr. Jyoti R. Munavalli and Dr. Bindu S, the event provided an open platform for discussion, followed by an interactive Q&A session, where participants gained practical knowledge to implement in their daily lives.

Internship on "Analog Circuit Design Using LTSpice and Simulink"

The Department of Electronics and Communication Engineering at BNMIT, in collaboration with IEEE Bangalore Section, IEEE-GRSS, IEEE-ComSoc, and IEEE-Nano Council, conducted a two-week internship program on "Analog Circuit Design Using LTSpice and Simulink" from 29th July to 9th August 2024. The program was led by Dr. Sunitha S V, Dr. Priyadarshini K Desai, Dr. Lakshmi Bhaskar, and Sri. Kiran K N, who guided 126 participants through the fundamentals of Electronic Circuits, LTSpice Simulations, Signal Processing, and Simulink Modeling.



The internship featured hands-on sessions covering amplifier circuits, oscillators, operational amplifier applications, communication system modeling, and ADC/DAC design. As a concluding activity, students participated in a hackathon, where they worked in teams to develop innovative solutions to real-world problems. The prototypes were evaluated by faculty experts, providing students with valuable feedback on their designs enhancing their problem-solving and circuit design skills.

Internship on "Design and Synthesis with Verilog HDL"

The Department of Electronics and Communication Engineering at BNMIT, in association with IEEE Bangalore Section, IEEE Nano Council, IEEE Circuits and Systems Society, and IEEE Photonics Society, organized a two-week internship on "Design and Synthesis with Verilog HDL" from 29th July to 9th August 2024. The internship was conducted by Dr. Rekha P., Dr. Manjunath G. Asuti, Dr. Smitha Gayatri, and Smt. Rohini T, who provided students with hands-on experience in digital circuit design and synthesis using Verilog HDL.



The sessions covered fundamentals of Verilog coding, combinational and sequential circuit design, FPGA-based synthesis, and industry applications. To enhance practical learning, students worked on mini-projects and participated in a hackathon, where they analyzed problem statements, developed solutions, and presented their designs. This internship equipped 120 students with essential skills in VLSI and digital system design, preparing them for industry roles in core electronics.

Internship on "Industrial IoT"

The Department of Electronics & Communication Engineering in association with IEEE-BNMIT Student Branch and Innovaskill Technologies Pvt. Ltd., Bengaluru, organized an internship on "Industrial IoT" from 26th August to 14th September 2024. The program focused on IoT-based industrial automation, real-time monitoring, and smart systems, equipping forty participants with industry-relevant knowledge.



This internship was tailored to equip students with both theoretical knowledge and practical expertise in Industrial IoT technologies, which are critical for enhancing industrial efficiency, automation, and smart system integration. Key focus areas included understanding automation tools like PLC and SCADA, and advanced programming techniques for real-world industrial applications.

Internship on "Generative AI"

The Department of Electronics & Communication Engineering in association with IEEE- Signal Processing Society and Pantech E-Learning, Bengaluru conducted a three-week internship on "Generative AI" from 26th August to 14th September 2024. The program was led by Mr. Gowtham K (Senior Project Engineer) and Mr. Jeswin A, who provided hands-on training to sixty-seven participants.



The internship covered Python programming, machine learning, and natural language processing (NLP) in the first week, followed by deep learning concepts and algorithm implementation in the second week. The final week introduced Variational Autoencoders (VAEs) and Generative Adversarial Networks (GANs). Participants worked on real-world projects using Python and PyTorch, which were evaluated at the end of the program.

Workshop on "Python for Remote Sensing Images"

The Department of Electronics and Communication Engineering, BNMIT under the banner of IEEE-GRSS student branch chapter of BNMIT conducted a workshop on "Python for Remote Sensing Images" on 9th October 2024.



The Department of Electronics and Communication Engineering, BNMIT under the banner of IEEE-GRSS student branch chapter of BNMIT conducted a workshop on "Python for Remote Sensing Images" on 9th October 2024. The workshop conducted by Dr. Keerti Kulkarni (Associate Professor, ECE, BNMIT) introduced thirty participants to Python-based image processing techniques for remote sensing applications. It included a brief introduction to Remote Sensing images and the ways to interpret the images in the Python environment using Google Colab.

IEEE Week – "Circuits, Chips, Charades"

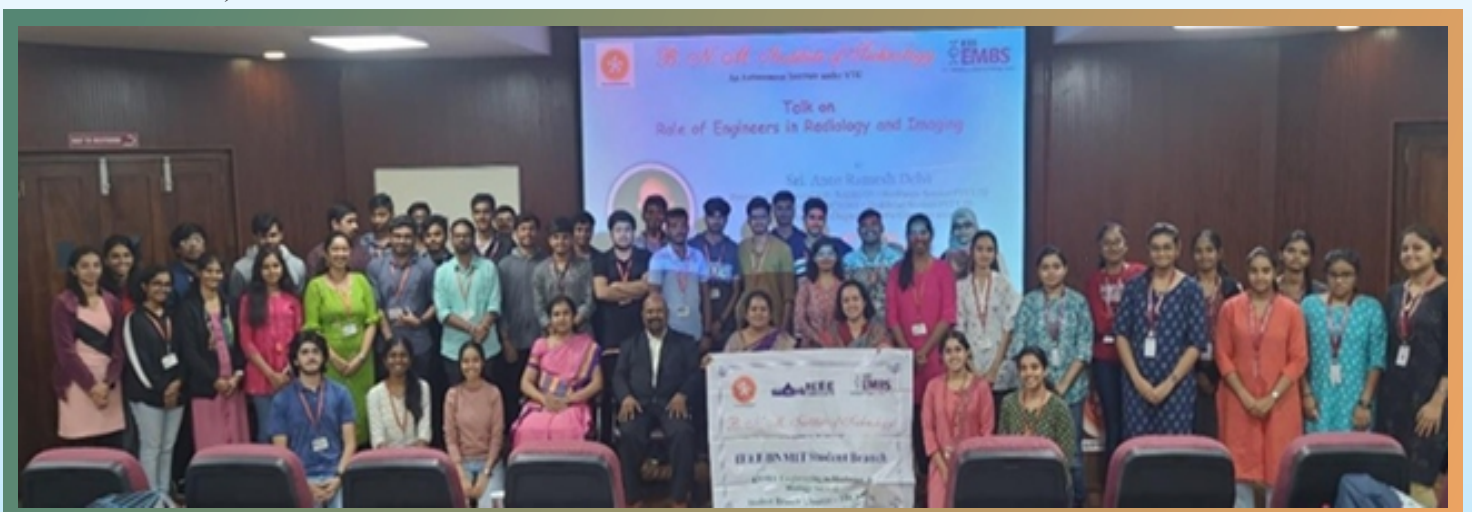
As part of IEEE Week, a technical talk and interactive session titled "Circuits, Chips, Charades" was held on 14th October 2024 by the IEEE Circuits and Systems Society (CASS) BNMIT Student Chapter. The session was led by Ramapriya C G (Senior Software Engineer, Intel Technologies, Bengaluru) and attracted 110 participants who engaged in fun learning activities related to electronic circuits and semiconductor technology.



"Circuits, Chips, and Charades" was a successful blend of technical learning and interactive activities. Mr. Ramapriya C.G.'s expertise and the hands-on simulation session with a RISC-V processor left students with a deeper understanding of modern microprocessor technology. This event effectively combined knowledge-sharing with a vibrant atmosphere, inspiring participants to further explore microarchitecture and hardware design.

Technical Talk on "Role of Engineers in Radiology and Imaging"

On 15th October 2024, IEEE-BNMIT Student Branch organized a technical talk on "Role of Engineers in Radiology and Imaging", delivered by Sri. Anto Ramesh Delvi Dass (Founder Chairman & MD, RADBLOX – Healthcare Services Pvt. Ltd.).



The session explored the crucial role of engineers in medical imaging technologies, emphasizing advancements in radiology, teleradiology, and diagnostic imaging. Mr. Anto shared insights from his three-decade career, detailing how engineers contribute to cross-sectional imaging and the development of specialized courses for technologists. The event, attended by 100 participants, provided an in-depth understanding of the intersection between engineering and healthcare.

Vision Quest Ideathon

The IEEE SPS BNMIT Student Branch Chapter organized the "Vision Quest Ideathon" on 18th October 2024, providing a platform for students to develop innovative solutions in healthcare, sustainability, and cybersecurity.



The event featured five teams who presented creative and technically sound projects addressing real-world challenges. The judging panel, led by Asst. Prof. Kiran K N (ECE Department) and Dr. Jyothi R Munavalli (Faculty Advisor, IEEE SPS BNMIT), provided valuable insights and feedback. The event fostered critical thinking, problem-solving, and technical creativity, encouraging students to apply their knowledge to practical applications.

Technical Talk on "Pre & Post-Silicon Bring-up and System Validation Emulation Flow"

The Department of Electronics & Communication Engineering in association with ISTE students Chapter BNMIT conducted a technical talk on "Pre & Post-Silicon Bring-up and System Validation Emulation Flow" on 23rd November 2024. The session was led by Mr. Mahesh Devagiri, Engineering Manager, Qualcomm, Bengaluru, who guided 80 participants through the intricate processes of silicon chip validation and debugging.



The session provided valuable insights for students aspiring to build careers in core companies. Mr. Mahesh Devagiri also shared industry knowledge, practical tips on entering the semiconductor industry, and a detailed explanation of silicon validation processes, making it an enriching experience and a very informative session for all attendees.

Alumni Series Talk on "Overview of VLSI Verification Methodology"

IEEE-BNMIT Student Branch hosted an Alumni Series Talk on 6th December 2024, where Ms. Vaishnavi B R (ASIC Engineer, NVIDIA, Bengaluru) shared insights on "Overview of VLSI Verification Methodology." The session, attended by 64 students, focused on industry practices in VLSI verification.



Ms. Vaishnavi provided a detailed understanding of VLSI Verification Methodology and its integration into the broader design flow. Her insights into the VLSI domain and practical advice on career preparation inspired attendees to explore this critical field further, equipping them with a clearer perspective on industry practices and expectations.

Innovista 2024 – Innovative Project Competition

IEEE-BNMIT Student Branch organized Innovista 2024, an Innovative Project Competition, on 17th December 2024. The event provided a platform for 120 participants to showcase their cutting-edge projects across various domains of technology, fostering innovation and creativity.



Students had been working on their projects since the beginning of the semester and delivered impressive presentations. The prototypes were evaluated by industry experts, who provided valuable feedback. To recognize and encourage outstanding innovation, the winners were rewarded with cash prizes.

STAFF ACHIEVEMENTS

Awards and Recognition

- **Lakshmi Bhaskar** defended her Ph.D. thesis titled “Analysis of Data Aggregation Techniques and its Optimization to Improve the Quality of Service in WSNs” under the guidance of Dr. Yamuna Devi C R, Associate Professor and Head, Department of ETE, Dr. AIT, on 20th July 2024.
- **Dr. Lakshmi Bhaskar** received the Merit Award for completing her Ph.D. by Karnataka AryaVyshya Mahasabha during the 14th Prathibothsava on 1st December 2024.
- **IEEE EMBS BNMIT Student Chapter** won the **Rising Star Award for 2024**, recognizing the activities conducted during the year guided by faculty advisor **Dr. Priya Sankpal**.



Patents

- Faculty inventors **Dr. Rekha P, Dr. Ashwini S Savanth, Sarala T, and Lakshmi Bhaskar** have been granted a patent titled “IoT Based Biotech Live Cell Imaging System” on 19th September 2024.
- Faculty inventors **Prof. Sumathi A, Dr. Lakshmi Bhaskar, and Dr. Jyoti R Munavalli**, along with student inventors **Mr. Madhusudhan S, and Ms. Mamtha V**, published a patent titled “Dual Mode Floating Waste Collector with Automated and Manual Operation” on 20th September 2024.
- Faculty inventors **Dr. Chaitra N and Dr. P.A. Vijaya**, with student inventors **Aniruddh Aithal, Darshan Kumar Hegde, and Girish P Kulkarni**, have been granted a patent titled “Real-Time Communication System for Facilitating Speech and Conversation Using Natural Language Processing and Neural Network” on 14th November 2024.
- **Dr. Sunitha S V, Dr. Subodh Kumar Panda, Dr. Lakshmi Bhaskar, and Dr. Yasha Jyothi M Shirur** published a patent titled “Train Anti-Collision Control Method” on 22nd November 2024.

Journal Publications

- **Sameera P**, Abhay A Deshpande published a paper titled “Efficient early-stage disease detection in pomegranate (*Punica granatum*) using convolutional neural networks optimized by honey badger optimization algorithm” in Cogent Food & Agriculture, Sep 2024, Vol. 10, No. 1, 2401051, DOI: 10.1080/23311932.2024.2401051.
- **Jyoti R Munavalli, Priya R Sankpal, Sumathi A** published a paper titled “Patient Pathway Optimization in Hospitals using Convolutional Neural Network and m-Artificial Bee Colony Algorithm” in Frontiers in Health Informatics, 13 (3), Oct 2024, 7568-7595.
- **Dr. Vrunda Kusanur, Dr. Rashmi S Bhaskar, Dr. Sujaya B L** published a paper titled “Design and Implementation of a Chatbot Using NLP for User Interaction” in the International Journal of Creative Research Thoughts (IJCRT), Oct 2024.

Books and Book Chapters

Books

Smt. Rohini T authored the book “IOT Made Easy: A Beginner's Guide to Building Smart Devices” <https://amzn.in/d/4qJ0NLk>

Book Chapters

- **Munavalli, J. R., Deshpande R.R., Oli J. M** contributed a chapter titled “AI Techniques for 6G Applications” in the book “Development of 6G Networks and Technology”, edited by Suman Lata Tripathi, Mufti Mahmud, C. Narmadha, S. Albert Alexander.
- **A. Sumathi, Sankpal P. R., Munavalli J. R., A. N. Anusha** contributed a chapter titled “Prediction of Onset of Seizures from EEG Signals Using ML Techniques” in the book “Advanced Electroencephalography Analytical Methods: Fundamentals, Acquisition, and Applications”, edited by Ganesh Naik, Wellington Pinheiro dos Santos, Gaetano Gargiulo.
- **Yasha Jyothi M. Shirur, S. Bindu, Munavalli J. R** contributed a chapter titled “Lightweight Crypto Mechanisms and Key Management in IoT Scenario” in the book “Secure Communication in Internet of Things- Emerging Technologies, Challenges, and Mitigation” edited by T. Kavitha, M.K. Sandhya, V.J.Subashini, and Prasad Srikanth.

STUDENT ACHIEVEMENTS

Awards and Recognition

- **Sudhanva K S Bhat** won 2nd place in Table Tennis at the state-level VTU Youth Festival held on 1st July 2024.
- **Vyshak & Varun S N** won 2nd prize & a cash prize of Rs. 20,000 for their project “Intelligent Parking Management System” in the National Level 24-Hour Hackathon (Recursive) held at Dayananda Sagar College of Engineering on 4th & 5th July 2024.
- **Parinitha D K and Pujitha Padmanabha** (IV semester) won 2nd Prize in the Digital Health Poster Presentation Competition held at BNMIT, Bangalore on 8th July 2024.
- **Sakshi N Sunil & Harshapradha D R** won 3rd prize in the Digital Health Poster Presentation Competition held on 8th July 2024.
- **Mridula R** secured 5th Rank in the VTU exams and was honored at the VTU convocation held on 18th July 2024.
- **Daksh Pankaj Patel** (8th ECE) received the Best Student Volunteer Award in the IEEE CASS Bangalore Chapter Awards 2024.
- **Monisha R and Niharika H** (5th ECE) were part of the yoga team that secured a gold medal at the VTU State Level Yoga Tournament 2024-25, held at Akshaya Institute of Technology on 23rd and 24th September 2024. This marked a hat-trick championship for BNMIT.
- **Shriparna Hegde** (5th Sem ECE) and **Akshay** (5th Sem ECE) were part of the men's yoga team that secured 4th place at the VTU State Level Yoga Tournament 2024-25, held at Akshaya Institute of Technology on 23rd and 24th September 2024.
- **Disha R and Mandaara S** (5th sem ECE) won 3rd prize in Circuits, Chips, Charades by IEEE Bangalore Section (IBM HACKATHON) on October 14th, 2024.
- **Tanushree Anand (5th Sem, ECE), Nagashree M B (5th Sem, ECE), and Nischitha K M (3rd Sem, ECE)** were part of the BNMIT Women's Volleyball Team that clinched 1st place at the VTU Bangalore Central Zone Volleyball Women Tournament 2024-25, held at CMR Institute of Technology on 15th & 16th October 2024.
- **Vyshak T M, Shreeram K R, Sanjana H S, and Shri Hari M (VIII Sem)** with the mentorship of **Dr.Rekha P (Professor, ECE, BNMIT)** secured a place in the National Finals of The Inventors Challenge 2024, organized by AICTE and STMicroelectronics India. Out of 2,300+ teams competing from across the country, this team has emerged among the top 24 finalists.
- **Anaghaa R, Abhishek P, and Bharath Y S** (8th sem ECE) were the winners of IGNITE Project 2024, conducted by IEEE ComSoc, for their project “Design and Simulation of Antenna for Hyperthermia Treatment of Breast Cancer” in December 2024.
- **Rakshitha U, Harsha M S, and Manonmaya S V** (4th sem ECE) won 2nd prize in the intra-college Innovista 2024 - IPL Competition, held on December 17th, 2024.
- **Gaayana G R, Chinmayi G, and Maanya Naveen Kumar** (4th sem ECE) won 3rd prize in the intra-college Innovista 2024 - IPL Competition, held on December 17th, 2024.

- **Shriniketana S Kalale, Subramanya D, and Shreesh Purandarvittal Tadas** (4th sem ECE) won 1st prize in the intra-college Innovista 2024 - IPL Competition, held on December 17th, 2024.

Journal Publications

- **Suhas R, Prajwal S, Vimallesh J, Kiran K N, Sarala T** published a paper titled “Vehicle Location Tracking System using GSM, GPS, and Geofencing Techniques” in International Research Journal of Engineering and Technology (IRJET), Volume 11, Issue 07, July 2024. <https://www.irjet.net/volume11-issue07>.
- **Sumathi A, Lakshmi Bhaskar, Prateeksha K Ankolekar, Shreya Shenoy, Vaishnavi Bhatt** published a paper titled “Smart Car Parking System” in International Journal of Scientific Research in Computer Science, Engineering, and Information Technology, Vol. 10, No. 4, pp. 312–316, August 2024, Doi-<https://doi.org/10.32628/CSEIT2410410>
- **Hemanth T M, Manjunath K M, Suhas Gowda H B, Vrunda Kusanur, Jyoti R Munavalli** published a paper titled “LI-FI Performance Analysis in Various Aquatic Environments for Reliable Underwater Communication”, in International Journal of Scientific Research in Computer Science, Engineering, and Information Technology, Volume 10, Issue 6, November-December 2024, 1695-1705. doi: <https://doi.org/10.32628/CSEIT2410473>
- **Nisha N, Shrieya S, R Shreyas, Keerti Kulkarni, and Jyoti R Munavalli** published a paper titled “Kidney Stone Detection using CNN Algorithm” in the International Journal of Scientific Research in Computer Science, Engineering, and Information Technology, Vol. 10, Issue 6, November-December 2024, 1814-1823.
- **Sandeep Kumar, Sanket Sharanappa Wali, Vinayak Tonne, Sudarshan D, Jyoti R Munavalli** published a paper titled “Agrosmart Precision Soil Analysis Bot for Nutrient Prediction and Fertilizer Recommendations” in International Journal of Scientific Research in Computer Science, Engineering, and Information Technology, Vol. 10, Issue 6, November-December 2024, 1824-1830.
- **Joshitha Lakshminarayana, Bhoomika K, Keerthana M, and Dr. Vrunda Kusanur** published a paper titled “Human Suspicious Activity Detection using Machine Learning” in the International Research Journal of Engineering and Technology (IRJET).
- **Harsha G S, Abhiram B Jois, Manjudarshan G N, Kiran K N** published a paper titled “Affordable Smart Humidifier for Indoor Application” in the International Research Journal of Engineering and Technology (IRJET).

Conference Publications

- **Shaurya and A. S. Savanth** presented a paper titled “Artificial Neural Network and Fuzzy Classifier for Synthetic Aperture Radar Image” at the 2024 Second International Conference on Networks, Multimedia and Information Technology (NMITCON), Bengaluru, India. Pages: 1-8. DOI: 10.1109/NMITCON62075.2024.10698848.

VTU Rank Holder



MRIDULA R Secured 5th Rank in the VTU exams and was honored at the VTU convocation held on 18th July 2024

Unscramble

1. OADLUMTINO → _____

2. CQYENUREF → _____

3. SCTOILROLA → _____

4. AAPCETCNAIC → _____

Answers in next edition

Alumni Speaks.....



I'm thankful to all the professors at BNMIT, in enabling me to gain strong engineering fundamentals and a good work ethic. I was able to find mentors to guide me in projects related to advanced design concepts that were aligned with my career goals

Kishore Jonnavittula

Batch: 2008 – 2012

Physical Design CAD Engineer, Apple, USA

Alumni Speaks.....



BNMIT has played a huge role in making me the person I am today. I have had the best coaching, supportive faculty, and friendly staff members who are always guiding you in the right direction and to top it off, I also made good friends who always supported me in my every step. This has enabled me to perform well and compete confidently. I will always remain grateful to this institution.

Kavya Srinivasa Setty

Batch: 2008 – 2012

Hardware Design Engineer at Google, California, USA

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