

COMPUTER SCIENCE ENGINEERING SOCIETY MAGAZINE



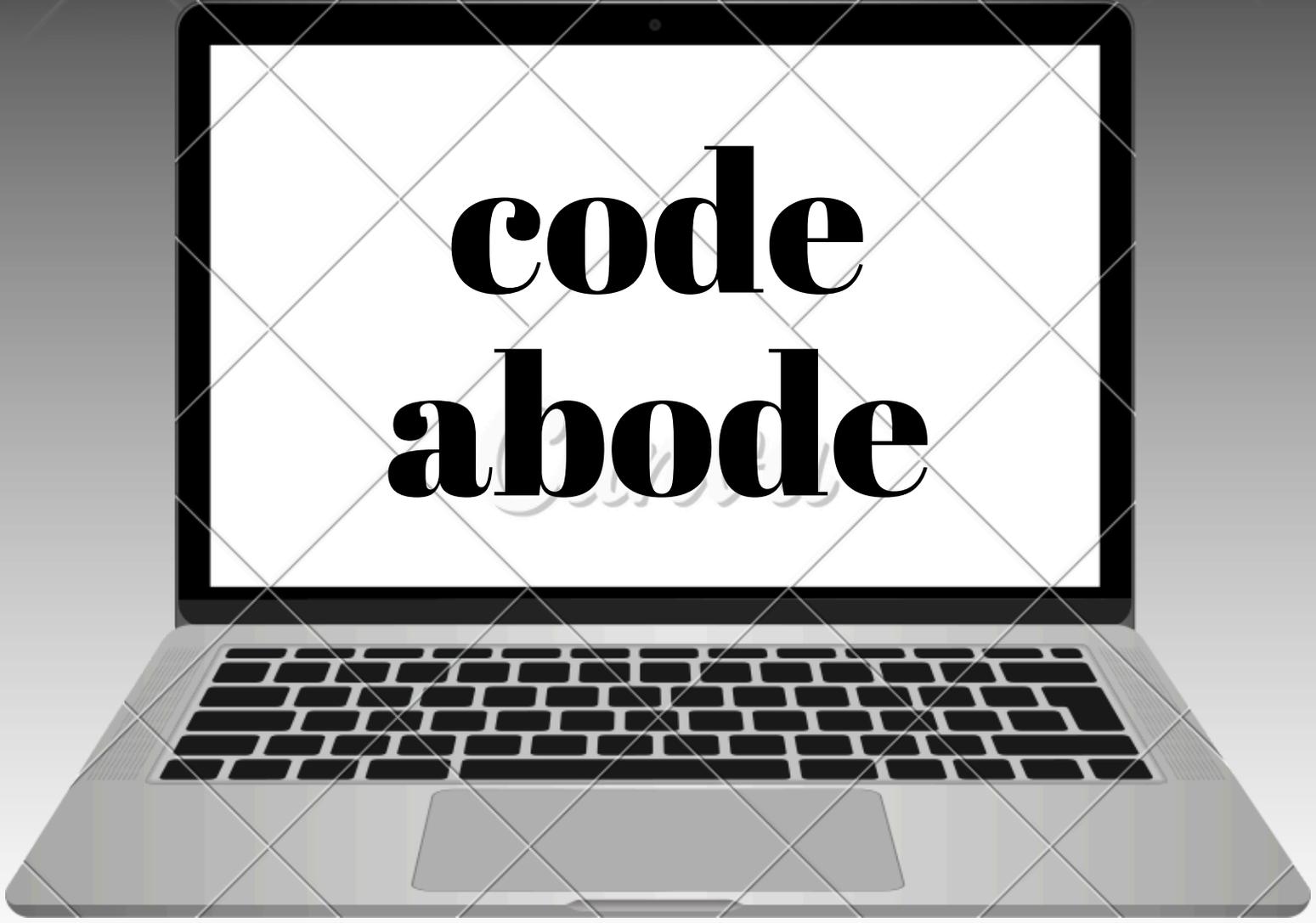
DEPARTMENT OF CSE, NIT MEGHALAYA

**JANUARY
TO MARCH
2025**

3rd Edition

CODE ABODE

*The department of Computer
Science and Engineering Brings to
You*



**code
abode**

TABLE OF CONTENT

01

About the Department

A brief introduction to the department of CSE

02

Research & Development

Research publication and projects of our department

03

Student Achievements

Achievements by our students

04

Faculty Details

Honorable faculties of our department

05

Student Details

UG & PG students in our department

06

Upcoming Events

Upcoming events by our department

ABOUT THE DEPARTMENT

The Department of CSE at NITM has adequate facilities to support each activity needed for a batch of 30 students (per semester). It has a well-qualified and experienced faculty team consisting of 9 faculty members. The Computer Science & Engineering department makes every effort in imparting high-quality education to its motivated students. One of the aims of this department is to play the role of producing Computer Engineers ready to satisfy the needs of the Computer and IT world. The Department is also actively involved in various research activities.

The department also started its Mtech program from 2014 with an initial intake of 20. There is also a PhD programme under which research scholars are admitted twice a year.

Vision

Attaining global recognition in Computer Science & Engineering education, research and training to meet the growing needs of the industry and society.



Mission

- Imparting quality education through well-designed curriculum in tune with the challenging software needs of the industry
- Providing state-of-art research facilities to generate knowledge and develop technologies in the thrust areas of Computer Science and Engineering.
- Developing linkages with world class organizations to strengthen industry-academia relationships for mutual benefit.



ABOUT THE DEPARTMENT

Program Educational Objectives (PEOs):

PEO1 Apply computer science theory blended with mathematics and engineering to model computing system.

PEO2 Design, implement, test and maintain software systems based on requirement specifications

PEO3 Communicate effectively with team members, engage in applying technologies and lead teams in industry.

PEO4 Assess the computing systems from the view point of quality, security, privacy, cost, utility, etiquette and ethics.

PEO5 Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

Program Specific Outcomes (PSOs):

PSO1 The ability to understand, analyse and develop solution strategy towards problems in the areas related to algorithms, system software, machine learning, and Artificial Intelligence, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2 The ability to understand the evolutionary changes in computing, apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success, real world problems and meet the challenges of the future.

PSO3 The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, lifelong learning and a zest for higher studies and also to act as a good citizen by inculcating in them moral values & ethics.



HODs CSE Department

08/01/2013 - 20/01/2014

**DR. ALOK
CHAKRABARTY**

01/07/2019 - 07/08/2022

DR. YOGITA

21/01/2014 - 19/01/2017

**DR. RAJARSHI
RAY**

08/08/2022 - 03/07/2024

**DR. SURMILA
THOKCHOM**

20/01/2017 - 30/06/2019

**DR. DIPTENDU
SINHA ROY**

04/07/2024

**DR. DEEPAK
KUMAR**

Research & Development



Journals

- Dkhar, Timothy, Chandrasen Pandey, Sharmila AJ Francis, Diptendu Sinha Roy, and Ashish Kr Luhach. "NeuroSync: A Novel Neural Network Architecture for Time Series Forecasting of Vehicle Traffic Data Over 5G and Beyond." *International Journal of Communication Systems* 38, no. 6 (2025): e70035.
- Hussain, M. W., Sangaiah, A. K., Reddy, K. H. K., Roy, D. S., Alenazi, M. J., & Javvaji, P. K. (2025). A Novel Intelligent Task Offloading Scheme for Multi-Controller Environment in Software Defined Internet of Vehicles. *IEEE Internet of Things Journal*.
- M. R. Singh, R. K. Barik, S. N. Qurashi, S. Thokchom and D. S. Roy, "A Novel Pairing Free Revocable Certificateless Encryption With Ciphertext Evolution for Healthcare System," in *IEEE Access*, vol. 13, pp. 27940-27951, 2025, doi: 10.1109/ACCESS.2025.3533367
- Abisek Dahal, Soumen Moulik, "Multi-stream CNN-BiLSTM Framework for Enhanced Human Activity Recognition Leveraging Physiological Signal", *IEEE Sensors Letters*, vol. 9, no. 2, Feb. 2025. DOI: 10.1109/LSENS.2025.3526446.
- Pratik, S., Sharma, P., Nayak, D.R. and Balabantaray, B.K., 2025. WMCF-Net: Wavelet pooling-based multiscale contextual fusion network for polyp classification. *Biomedical Signal Processing and Control*, 107, p.107727
- Pratik, S., Sharma, P., Balabantaray, B.K. and Pachori, R.B., 2025. MSPolypNet: A residual multi-scale semantic approach for polyps segmentation. *Computers and Electrical Engineering*, 123, p.110224.
- Rana, D., Pratik, S., Balabantaray, B.K., Peesapati, R. and Pachori, R.B., 2025. GCAPSeg-Net: An efficient global context-aware network for colorectal polyp segmentation. *Biomedical Signal Processing and Control*, 100, p.106978.
- Dillip Kumar Mishra, Bunil Kumar Balabantaray, 2025, RSA vs Quantum Encryption: Flexibility, Security, and Performance Analysis for Information Processing, *Journal of Information Systems Engineering and Management* (Accepted)

Conferences

- Shemphang Ryntathiang, Abisek Dahal, Soumen Moulik, “Leveraging Gait Patterns and Machine Learning for Early Detection of Alzheimer's Disease”, IEMENTech 2025, Kolkata, India, 31 Jan - 2 Feb, 2025.
- Anurag Joardar, Ningthoujam Johny Singh, "Adapting Vision Transformers for Effective Facial Expression Recognition", in 3rd International Conference on Intelligent Systems, Advanced Computing and Communication, IEEE, 27 - 28 February, 2025

Running Projects

- Design and Development of Intelligent Cyber Physical System for Prediction, Early Detection and Remote Monitoring of Alzheimer's Disease in Real-Time using Bio-Multifunctional Smart Wearable Sensors. Funded by Science and Engineering Research Board (SERB) at a total cost of ₹6111867/-

PI: Dr. Soumen Moulik, Computer Science & Engineering, NIT Meghalaya

Co-PI: Dr. Debasis Das, Computer Science & Engineering, IIT Jodhpur

Dr. Badal Soni, Computer Science & Engineering, NIT Silchar

- A Deep Learning Approach for Preservation of Cultural Heritage. Funded by SERB at a total cost of ₹23,91345/-

PI: Dr. Bunil Kumar Balabantaray, NIT Meghalaya

- Use of Artificial Intelligence and Deep Learning Methods to predict Pain outcomes after transforaminal nerve block (TENB) in patients of lumber spondylosis. MRU-AIIMS Raebareli ₹50000/-

PI: Dr. Bunil Kumar Balabantaray, NIT Meghalaya



Student
Achievements

Student Achievements

Ph. D Thesis Awarded

Mr. Chandrasen Pandey (P21CS017) from the Department of Computer Science Engineering under the supervision of **Prof. Diptendu Sinha Roy** has been awarded Doctor of Philosophy for the thesis entitled “**Data Augmentation with Generative AI for Edge Traffic Analytics over 5G and Beyond Networks**” on 7th March 2025.



Mrs. Sonali Samal (P21CS002) from the Department of Computer Science Engineering under the supervision of **Dr. Bunil Kumar Balabantaray** has been awarded Doctor of Philosophy for the thesis entitled “**Development of Efficient Deep Learning Models for the Identification of Obscenity to Safeguard Women, and Society**” on 7th March 2024.

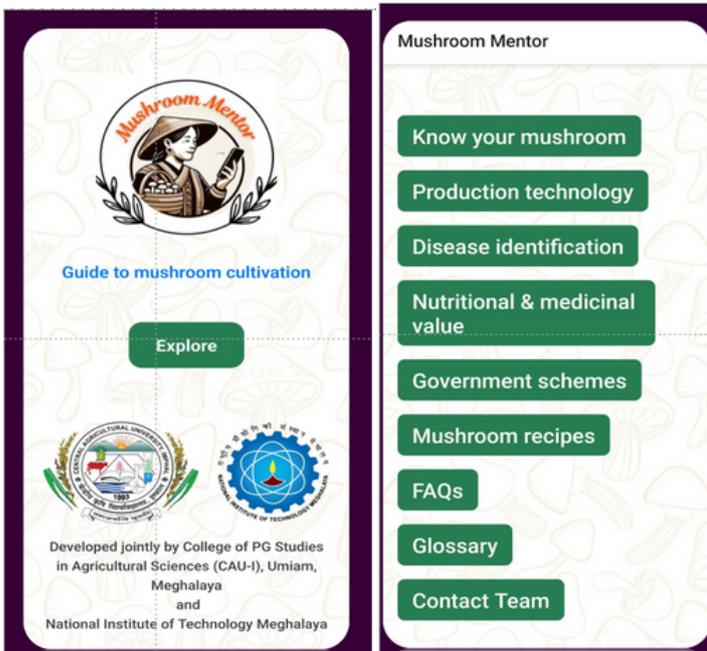
Mr. Anil Kumar Swain (P19CS007) from the Department of Computer Science Engineering under the supervision of **Dr. Bunil Kumar Balabantaray** has been awarded Doctor of Philosophy for the thesis entitled “**Development of AI-Driven Techniques for Enhanced Lung Cancer Detection and Classification**” on 7th March 2024.



Student Achievements

Ph. D Thesis Awarded

Mr. SR Ngamwal Anal(P19CS011) from the Department of Computer Science Engineering under the supervision of Dr. Yogita has been awarded Doctor of Philosophy for the thesis entitled “Detection of Adverse Drug Reactions Using Deep Learning Techniques with Case Studies on COVID-19 Vaccines and Drugs” on 7th March 2025.



An android-based app “**Mushroom Mentor**” is developed for Meghalaya mushroom farmers jointly by College of PG studies in Agriculture Science (CAUI), Umiam and NIT Meghalaya with team of students and faculties.

Indian patent on "A SYSTEM AND A METHOD FOR QUANTUM COMMUNICATION BY OBJECT TELEPORTATION IN VARIANT SPACE TIME DOMAIN" is granted to Mr. Dilip Kumar Mishra (P22CS002) and Dr. Bunil Kumar Balabantaray on 24.01.2025.



Faculty Details





**Prof. Diptendu Sinha Roy Ph.D, BIT Mesra
Professor & Dean (Research & Consultancy)**

Research Interest

Grid, Cloud and Distributed Systems, Data Analytics in Smart Grid Domain, Application of Soft and Evolutionary Computing, Software Reliability

**Dr. Deepak Kumar Ph.D , NIT Meghalaya
Assistant Professor & HOD**

Research Interest

Computational Mathematics, Digital Signal Processing, Machine Learning



**Dr. Akhilendra Pratap Singh, Ph.D, IIIT
Allahabad**

Assistant Professor

Research areas:

Blockchain Technology, Service Computing, Service Oriented Network Architecture, Localization and Routing in Wireless Sensor Networks, Semantic Web and Linked Open Data.





Dr. Bunil Kumar Balabantaray, Ph.D. (NIT Rourkela)

Assistant Professor

Research Interest

Robotics , Image Processing, Biomedical Image Analysis and Cyber Security

Dr. Diangarti Bhalang Tariang Ph. D,
IIT Kharagpur

Assistant Professor

Research Interest

Machine Learning, Deep Learning,
Generative AI, Multimedia Forensics,
Synthetic Media Forensics.



Dr. Ngangbam Herojit Singh PhD, NIT Manipur

Assistant Professor

Research Interest

Mobile Robot Navigation, Artificial Intelligence, Healthcare Applications, Hybrid Intelligent System



Dr. Ningthoujam Johny Singh PhD,
IIT Manipur

Assistant professor

Research Interest

Computer Vision, Machine Learning,
Deep Learning, Machine Translation
for low resource languages

Dr. Soumen Moulik Ph.D, IIT Kharagpur,
India

Assistant Professor

Research Interest

Wireless Personal/Body Area Networks
(MAC of IEEE 802.15.4, IEEE 802.15.6),
Wireless Sensor Networks, Internet of
Things, Machine Learning



Dr. Surmila Thokchom Ph.D, NIT
Meghalaya

Assistant Professor

Research Interest

Security in Cloud computing, IoT, Smart
grid, Cryptography and Machine Learning





Dr. Thoudam Doren Singh PhD,
Jadavpur University

Assistant professor

Research Interest

Human Language Technology,
Applied Machine Learning, Big Data,
Cloud Security, and Social Media
Analytics.



Student
Details

BTECH 2021-2025

Faculty Advisor

DR. AKHILENDRA PRATAP



**Anshu Das
B21CS001**



**Parthiv Das
B21CS002**



**Ananya Manohar
B21CS003**



**Freddy John Dkhar
B21CS004**



**Kishan Ranjan
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**Ankit Singh
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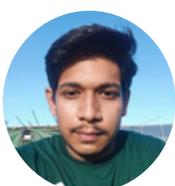
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T VIKRAM RATHOD
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The
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Mughalu
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Ericson Rani
P24CS012

Alumni Insights





***Dr. Kaushik Ray,
Assistant Professor,
Department of CSE,
NERIST***

Reflecting on my journey at NIT Meghalaya, I realize it was more than just an institution—it was a home, a place where I grew, learned, and built lifelong connections. The experiences I gained, both academically and personally, have shaped who I am today. Here's a small piece that captures my time at NIT Meghalaya.

*NIT Meghalaya—a place I once called home,
Where dreams took flight and minds would roam.
Amidst the hills, beneath skies so wide,
I found my passion, my strength, my guide.*

*Mentors who lit the spark to grow,
Friends who stayed through highs and lows.
Late-night coding, coffee runs,
Endless laughter, midnight puns.
Not just books, but life it taught,
In every challenge, a lesson was caught.
Moments fleet, yet memories stay,
NIT Meghalaya—lighting my way.*



Divyasree Dev

*B.Tech (2020-2024 Batch,
CSE)*

Currently at Morgan Stanley

- 📌 1st Recipient of the Chairperson's Gold Medal*
- 📌 Former Student Convenor, Coding Club*
- 📌 Generation Google Scholar*

Dearest Juniors,

Life at NIT Meghalaya was a journey of learning, struggles, setbacks, and growth. I've been in your shoes—navigating academics, self-doubt, and the pressure to prove myself. There were times when I felt like everything was falling apart. But every challenge you face here will shape you into the beautiful, wholesome person you deserve to be.

The world beyond college is challenging, but your time here has prepared you in more ways than you realize—not just academically, but in resilience, self-trust, and the ability to adapt. However, learning doesn't stop when you step beyond these gates. Whether in your job or higher studies, learning is a continuous journey. True success comes not only from expanding your knowledge but also from standing firm in your values, setting boundaries, and staying true to yourself.

So, stay curious, keep learning, believe in yourself, and never let fear dictate your choices. You are capable of more than you can imagine.

Your story is still unfolding—so don't give up on yourself yet.

*Rooting for you always,
Divyasree Dev*

FRATERNIFIED ARTICLES

The background is a soft-focus photograph of a desk. In the foreground, a black pen lies on a white, lined notebook. To the right, a dark-colored coffee cup with a white rim is visible. The lighting is warm and diffused, creating a professional yet inviting atmosphere.

From Chatbots to Action: Meet Agentic AI

by

Jishnu Duhan (B23CS037)

You might think chatbots can do everything—so what's next? Enter Agentic AI. Unlike traditional AI, which responds to prompts, Agentic AI takes action on your behalf. Many experts consider intelligent agents to be the ultimate goal of artificial intelligence, as defined by Russell and Norvig in their seminal work: "the study and design of rational agents."

To truly understand Agentic AI, we first need to ask: What is an agent?

Simply put, an agent is any system that can perceive its environment and take actions to influence it. Whether it's a self-driving car navigating traffic or an AI assistant managing your schedule, an agent interacts with the world around it rather than just responding passively.

Agentic vs. Generative AI: A Paradigm Shift

We've all become familiar with AI in its current, somewhat limited forms. We ask Siri for the weather, use ChatGPT to solve our assignments, and maybe even interact with customer service chatbots that (sometimes) help us solve problems. These are examples of generative AI – tools that can create text, images, or code based on our prompts. But what if AI could do more than just generate responses? What if it could truly act on our behalf? That's the promise of agentic AI.

While a Generative AI might draft a scholarship application, an Agentic AI could find relevant scholarships, fill out applications using stored academic data, track deadlines, and submit forms automatically.

Drawing from NVIDIA's framework, Agentic AI operates through a cyclical process:

1. Perceive: Gather data from sensors, databases, or user inputs.
2. Reason: Use large language models (LLMs) to analyze information and strategize.
3. Act: Execute tasks via APIs, robotics, or software tools.
4. Learn: Refine strategies using feedback loops, improving over time.

For instance, in healthcare, IBM's Agentic AI can monitor patient vitals, adjust treatment plans, and notify doctors— while continuously improving through experience.

Challenges: The Double-Edged Sword of Autonomy

Agentic AI's power comes with risks. A single error in a multi-step process can cascade— imagine a logistics agent misrouting shipments due to a flawed weather prediction. Moreover, as agents handle high-stakes tasks (e.g., financial trading or medical diagnoses), ethical concerns around accountability and bias intensify. Ensuring robustness requires rigorous testing, "guardrails" for critical decisions, and transparency in AI reasoning.

Conclusion

The leap from simple chatbots to true AI agents is a game-changer. Agentic AI isn't about replacing humans—it's about empowering us with intelligent digital partners that handle complex tasks, freeing us to focus on creativity and innovation.

The journey has just begun, but one thing is clear: Agentic AI is set to shape the future of technology and society in ways we can only begin to imagine.

References:

- S. Russell & P. Norvig (2021) | Artificial intelligence: A modern approach.
Pounds, E. (2024, October 22). What is agentic AI? NVIDIA Blog.



UPCOMING
EVENTS

COMING
SOON
Stay Tuned

Upcoming Events

Department of Computer Science and Engineering to Launch MCA Program Under NIMCET

The Department of Computer Science and Engineering (CSE) is planning to introduce the Master of Computer Applications (MCA) program, which will commence starting from next academic year. The program will be offered under the prestigious National Institute of Technology Master of Computer Applications Common Entrance Test (NIMCET) counseling, ensuring a standardized and high-quality curriculum. The admission into the MCA program is based on the rank obtained in NIMCET only.

5th International Conference on Intelligent Systems and Machine Learning is scheduled to organize by the Computer Science and Engineering Department during 16-17 May, 2025 at NIT Meghalaya

ICISML-2025
The 5th International Conference on Intelligent Systems and Machine Learning (ICISML-2025) is a leading event focused on the latest advancements in intelligent systems and machine learning. These technologies play a vital role in analysing vast amounts of data, aiding decision-making, and driving progress across various domains. By enabling machines to learn from data and perform human-like tasks, they facilitate the discovery of valuable insights and patterns. The conference provides a platform for researchers, practitioners, and industry experts to exchange knowledge, discuss challenges, and explore emerging trends in this dynamic field.

ABOUT NIT MEGHALAYA
The National Institute of Technology Meghalaya is one among the 31 NITs in India established under the NIT Act 2007 (Amended 2012) of the Parliament of India as Institutes of National Importance with full funding support from the Ministry of Education, Government of India. The Institute presently situated at Laitumkrah, Shillong, India. The Institute has five Engineering Departments as Mechanical Engineering, Civil Engineering, Electrical Engineering, Electronics and Communication Engineering and Computer Science and Engineering. Since 2017, we are consistently maintaining our position in NIRF in top 100 institutes of India. In 2024, we are ranked at 68 by NIRF.

SHILLONG
Shillong is the capital city of Meghalaya and the District headquarter of East Khasi Hills. It is the only hill station in the country that is accessible from all sides. The name Shillong is derived from U-Shyllong, a powerful deity and is situated at an altitude of 1,491m above sea level. Shillong is very well connected by air (Guwahati and Umroi Airport), by road (NH, connecting Guwahati-Shillong and by railway station NIT Meghalaya campus is located at about 35 km from Umroi airport, 120 km from Guwahati airport and about 97 km from Guwahati railway station.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
The Department of Computer Science & Engineering, NIT Meghalaya offers B. Tech degree in Computer Science and Engineering discipline. This U.G Programme in Computer Science and Engineering is perhaps the most popular Programme in NIT Meghalaya, with an average intake of 30 students per year. The department has adequate facilities to support these teaching activities. It has a well-qualified and experienced faculty team. The Computer Science and Engineering department makes all efforts in imparting high-quality education to its highly motivated students. One of the aims of this department to play its role of producing Computer Engineers ready to satisfy the needs of the Computer and IT world. The Department is also actively involved in various Research activities.

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