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ISSUE 4

# SANGANAK

The Annual Newsletter of the Department of Computer Applications



## DEPARTMENT OF COMPUTER APPLICATIONS

ASSAM ENGINEERING COLLEGE  
JALUKBARI - GUWAHATI-13  
ASSAM, INDIA

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## Table of Contents

➤ Message from Principal, AEC and HoD, CA	3
➤ Message from Editorial Committee	3
➤ Departmental Profile	4
➤ Faculty and Staff Information	4
➤ Vision, Mission and PEO's of the MCA Program, AEC	5
➤ Department's Achievement	5
➤ Events/Activities	6
➤ Publications	14
➤ Faculty Activities/Achievements	15
➤ Students Activities/Achievements	19
➤ Article	22
➤ A Tribute to the Living Legend	31
➤ Photo Gallery	32

## Message from the Principal, AEC

I extend my heartfelt congratulations to the Department of Computer Applications, Assam Engineering College, on the publication of their 4th edition of "*Sanganak*", the annual departmental newsletter. This edition thoughtfully showcases the various events and achievements of the department. I am confident that *Sanganak* will serve as a valuable source of information and inspiration for students, faculty members, and the wider community. I wish the department and its students every success in all their future endeavours.

**Dr. Bipul Talukdar**  
Principal (i/c)  
Assam Engineering College



## Message from the HoD, CA Department, AEC

It is with great pride to present the 4th edition of our annual departmental newsletter, "*Sanganak*". This publication reflects the collective efforts, academic pursuits, and vibrant activities of the Department of Computer Applications. I sincerely appreciate the dedication of the faculty members and staffs, students, and the editorial team whose contributions have made this edition meaningful. I extend my best wishes to all members of the department and congratulate the editorial team on the successful release of this edition. May "*Sanganak*" continue to inspire and strengthen our academic community in the years ahead.

**Dr. Subhrajyoti Bordoloi**  
HoD, Department of Computer Applications  
Assam Engineering College



## EDITORIAL MESSAGE



On behalf of the Editorial Committee, we are pleased to present the 4th edition of "*Sanganak*", the annual newsletter of the Department of Computer Applications, Assam Engineering College. *Sanganak* serves as a reflection of the department's academic initiatives, activities, and achievements, and stands as a record of our collective growth since its inception in 2023. We sincerely thank the faculty members and staffs, students, and alumina whose efforts have made this publication possible. We hope this edition provides a comprehensive overview of the department and continues to inspire excellence and innovation within our academic community.

## Sanganak Committee

### Professor-In-Charge

Dr. Amrita Bose Paul, Professor  
Dr. Bornali Gogoi, Professor

### Members

Dr. Subhrajyoti Bordoloi, HoD  
Dr. Maushumi Barooah  
Dr. Jyoti Prokash Goswami  
Prof. Nelson Varte  
Dr. Antara Malakar  
Dr. Anindita Borah

## DEPARTMENTAL PROFILE

The Department of Computer Applications, Assam Engineering College, Guwahati was formed in the year 1990 under the leadership of Late Prof. A. K. Padmapati (Ex-Principal), with the approval from Ministry of Human Resource and Development. The program started under this department is Master of Computer Application (MCA), which has been designed keeping in mind the needs of the Global Information Technology Industry. In view of the world-wide shortage of skilled manpower in the field of Information Technology, the Department strives to channelize talented youth of this region to this challenging and knowledge intensive field by imparting quality technical knowledge and skills in this field. The Department has state of art infrastructure and funded research laboratories (Meity/DIT/AICTE) which are recognized by Assam Science and Technology University for research work in Computer Science and Engineering leading to a Ph.D. degree under the University. Research areas of faculty members cover Artificial Intelligence, Machine Learning, Computer Networks, QoS, Wireless Networks, Computer and Network Security, Trust Computing, Theoretical Computer Science, VLSI, Mobile Communications, Data Mining and Soft Computing, Graph Theory, Web-based application development etc. Since its inception, the department has always been recognized all over India and abroad for excellence in teaching and research. The department has an annual intake capacity of 30 students and the Student-to-Faculty ratio is 9:1.

### FACULTY LIST

Dr. Subhrajyoti Bordoloi	Professor & HoD
Dr. Maushumi Barooah	Professor
Dr. Jyoti Prokash Goswami	Professor
Dr. Amrita Bose Paul	Professor
Dr. Bornali Gogoi	Professor
Prof. Nelson Varte	Associate Professor
Dr. Antara Malakar	Assistant Professor
Dr. Anindita Borah	Assistant Professor

### STAFF LIST

Mr. Naba Kalita	Scientific Assistant
Mr. Ashok Sarma	Technical Operator
Mr. Apurba Das	Multi-Tasking Staff
Mr. Rajiv Das	Multi-Tasking Staff
Ms. Deepshikha Das	Multi-Tasking Staff



From Bottom to Top & Left to Right

Prof. Nelson Varte, Dr. Anindita Borah, Dr. Amrita Bose Paul, Dr. Subhrajyoti Bordoloi, Dr. Maushumi Barooah, Dr. Jyoti Prokash Goswami, Mr. Naba Kalita, Mr. Ashok Sarma, Ms. Deepshikha Das, Dr. Antara Malakar, Dr. Bornali Gogoi, Mr. Apurba Das, Mr. Rajiv Das

**VISION OF THE DEPARTMENT**

To be a department of excellence in IT domain for sustainable development.

**MISSION OF THE DEPARTMENT**

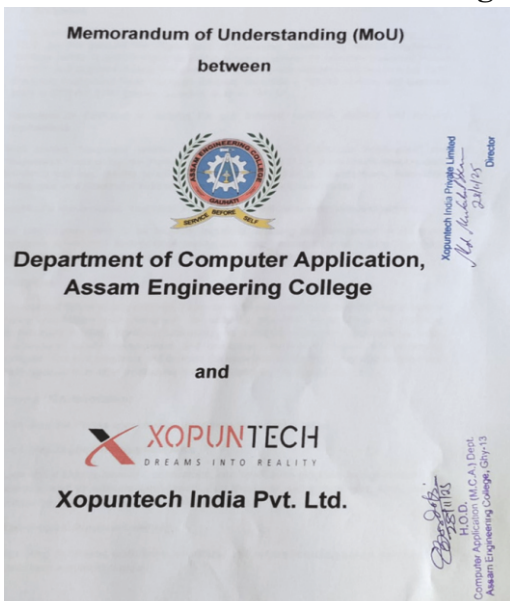
- ◆ M1: To impart knowledge and skills in IT domain to prepare technical manpower for industry and societal needs.
- ◆ M2: To carry out state-of-the-art projects, Research and Development works and promote entrepreneurial activities.
- ◆ M3: Facilitate upskilling and reskilling state-of-the-art IT related activities towards societal and sustainable development.

**PEO's OF THE MCA PROGRAM, AEC**

- ◆ PEO1: To equip students with in-depth computational knowledge, programming skills and application development methodologies for holistic development.
- ◆ PEO2: To apply state-of-the-art tools, latest technologies and research to create systems for solving society and industry-oriented problems.
- ◆ PEO3: To foster innovative thinking, critical problem-solving abilities and analytical skills in students.

**DEPARTMENT'S ACHIEVEMENT**

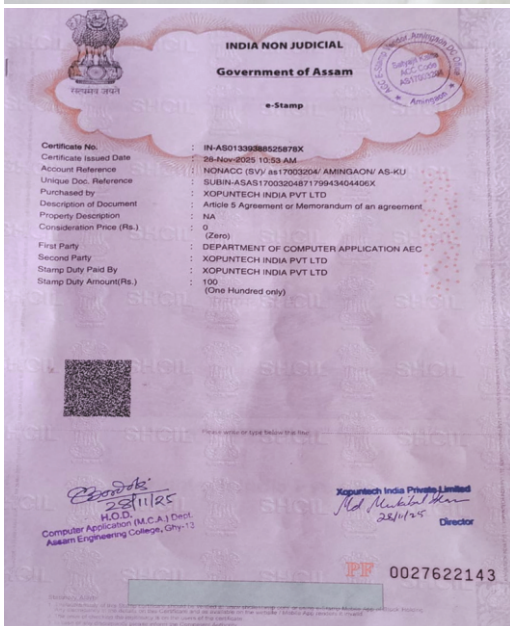
**Memorandum of Understanding (MoU)**



On November 28, 2025 the MoU has signed between

- Computer Application Department, AEC and Xopuntech India Pvt. Ltd.
- AEC and Xopuntech India Pvt. Ltd.

The scope of the collaboration is Industry-aligned training programs, workshops and practical learning, internship opportunities, placement assistance, joint courses and certification, faculty development programs and student ambassador program. This collaboration marks a meaningful step toward bridging academic knowledge with real industry experience. The company also signed and MoU with AEC.



**DEPARTMENTAL EVENTS/ACTIVITIES DURING THE YEAR 2025**

■ **Departmental Advisory Board Meeting & Stakeholder’s Meet**

On June 28, 2025, the first Departmental Advisory Board (DAB) meeting was held to present the proposed Vision, Mission, Program Education Objectives (PEOs) and Program Specific Outcomes (PSOs) for any suggestions/ remarks/ modifications from the DAB members. This modified Vision, Mission, PEOs and PSOs were shared with the departmental stakeholders for their comments and any further suggestions. In this respect, the stakeholder's thoughts, concerns and suggestions were incorporated.



Departmental Advisory Board Meeting



Students, faculty & Staff members, Alumnae, Recruiters, Parents, People from Academic & Industry during the Stakeholder’s Meet



**MCA-AEC PRESENT**

**Industrial Interaction Program with Xopuntech India Pvt Ltd**

**Topic: SKILL DEVELOPMENT & PLACEMENT OPPORTUNITIES IN THE IT SECTOR**

**Saturday, November 8, 2025 | 10:45 AM**

**Mechanical Engineering Conference Hall**

**Speaker: Md Mukibul Islam CEO & CO-Founder, XopunTech**

### ■ Industrial Interaction

On November 8, 2025, the department took the opportunity to coordinate an Industrial Interaction Program with Xopuntech India Pvt. Ltd. The students had a chance to interact with the entrepreneur/ industry expert Er. Mukibul Islam, CEO & Founder of the organization about the 'Skill Development & Placement Opportunities in the IT sector'. The interaction program was coordinated by Dr. Amrita Bose Paul.



### ■ Workshop on Cyber Security Awareness

The Cyber Security Awareness workshop under the Information Security Education & Awareness (ISEA) Project has been conducted on 18th November, 2025 with the technical support and expertise from the C-DAC Centre, Guwahati. A total of 86 students from the Computer Science and Engineering (CSE), Computer Applications (CA) and Electronics and Telecommunication Engineering (ETE) departments participated in this workshop. The workshop helped the students to understand the importance of cyber-security, common cyber threats, and practical tips to ensure safe online practices. Further, the workshop benefits the students to learn how to secure digital identities and online transactions with tools & resources available for cybersecurity. The workshop was interactive and includes real-world examples of cyber threats and their potential impact. The awareness program was jointly coordinated by ETE, CSE & CA department.



**सी डैक CDAC**

**WORKSHOP ON CYBER SECURITY AWARENESS**

**Organized by**

Electronics & Telecommunication Engineering Department,  
Computer Science & Engineering Department,  
Computer Applications Department,  
Assam Engineering College

**In Association with**

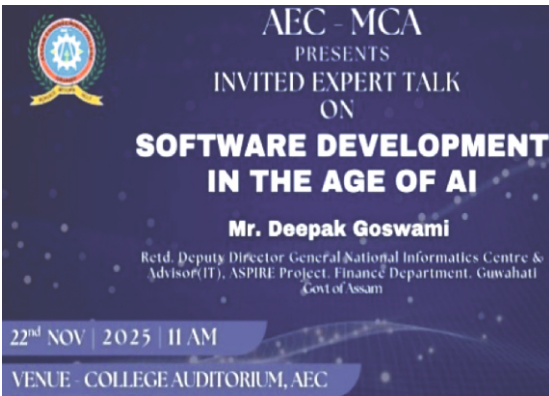
Centre for Development of Advanced Computing, Guwahati

**Date: Tuesday, 18 November** **Venue: ETE Dept., Room No.- G6**



■ Invited Expert Talk

On November 22, 2025, the department organised an Invited Expert Talk on "Software Development in the Age of AI" with Mr. Deepak Goswami, Retd. Deputy Director General, National Informatics Centre (NIC) & Advisor (IT), ASPIRE project, Finance Department, Govt. of Assam, Guwahati. The talk highlighted how AI is reshaping modern software engineering practices using AI-driven tools, frameworks, and development methodologies that improves code quality and transforming the role of software developers. Further, it helps students to understand the evolving skill sets required in an AI-enabled industry, while emphasizing the importance of ethical and responsible use of AI in development practices. Additionally, the session aimed to inspire learners to explore emerging career paths and research opportunities in the intersection of AI and software engineering. The talk was coordinated by Dr. Amrita Bose Paul and Dr. Bornali Gogoi.



■ Exposure to Career Awareness

The talk on "Career Awareness for Study Abroad with Scholarship Opportunities" has been conducted on 28th November 2025. A total of 73 students from the Departments of Computer Applications (CA), Computer Science and Engineering (CSE), and Electronics and Telecommunication Engineering (ETE) have participated in the inspiring session. The programme has offered valuable insights into global education opportunities and motivated students to explore academic prospects beyond national boundaries. The talk empowered them to make informed decisions and unlock global opportunities that align with their career goals by connecting students with credible information, mentorship, and structured guidance. The awareness program was conducted by Dr. Antara Malakar.



### ■ Industrial Visit

The Department organized an Industrial Visit for the final year students to Xopun Tech India Pvt. Ltd. On December 10, 2025. The visit aimed to provide students with practical exposure to Real-time software development workflow, Industry insights into ML, AI & software development. It further emphasized on the significance of teamwork, communication & continuous learning, professional ethics, corporate culture and networking opportunities with industry professionals. The exposure to industry visit was coordinated by Dr. Amrita Bose Paul and Dr. Bornali Gogoi.



### □ Bhogali Bihu Celebration



❑ **Newsletter Inauguration : SANGANAK, Issue-3, 2025**

On the occasion of the 70th Foundation Day of AEC, the 3rd Issue of the SANGANAK was published. The editorial committee, along with other esteemed faculty members were present at the Inaugural ceremony



❑ **Celebration of Saraswati Puja :**

The Department celebrated Saraswati Puja on February 2, 2025 together with students, faculty and other staff members



### Final Semester Project Viva

The Project Presentation and Viva for the MCA final semester (Batch 2023-25) student was held on 30th June 2025



### Farewell of Final Semester MCA Students (Batch 2023-25) on 1st July, 2025



### Biswakarma Puja Celebration

The Department celebrated Sri Sri Biswakarma Puja on September 17, 2025 together with students, faculty & other staff members.



**Teachers' Day Celebration**

The Teachers' Day was celebrated on 5th September, 2025 and organised by the students of 1st & 3rd semester. It was followed by different cultural activities by both students and faculty members.



**Visit at the 15th India Industrial Trade Fair held at Veterinary Field on 31st October 2025**



❑ Celebration of Freshman Social for the Newly Admitted MCA Students (Batch 2025-27)



Guwahati, Assam, India  
4mv5+4v4, Aec Rd, Jalukbari, Guwahati, Assam  
781013, India  
Lat 26.143018° Long 91.659979°  
03/01/25 10:20 AM GMT +05:30

Google

Project seminar presentation of 3rd Semester MCA, 2023-25 on 3rd January, 2025



An Alumna sharing her opinion with the stakeholders

## PUBLICATIONS

■ **Journal :**

- ❖ Pinky Saikia Dutta, Amrita Bose Paul, Subhrajyoti Bordoloi, "STNBL: A Crop Yield Prediction Framework for Assam Using Stacking and Blending Methodology", International Journal of Environmental Sciences (Elsevier), Volume 11, Issue 6 (2025), Pages 2437-2449
- ❖ Nelson R Varte, Kaustubh Bhattacharyya, Navajit Saikia, "Advancing Environmental Monitoring: YLO Algorithm For Real- Time Detection Of Greater One-Horned Rhinos," International Journal of Environmental Sciences, Volume 11(11s), 2025, Pages 995-1007, DOI:10.64252/hg0c1n40
- ❖ Nelson R Varte, Kaustubh Bhattacharyya, Navajit Saikia, "Advancing Greater One-Horned Rhino Conservation: A Yolo Instance Segmentation Framework with Morphological and Semantic False Positive Suppression," Journal of Environmental Protection and Ecology, Volume 26, Year 2025, Pages 2427-2438
- ❖ Nelson R Varte, Kaustubh Bhattacharyya, Navajit Saikia, "Continual YOLO-based Detection for Long-Term Monitoring of the Greater One-Horned Rhino", International Journal of Science And Engineering, Volume 11(2), 2025, DOI: 10.53555/qn83mp49
- ❖ Nelson R Varte, Bornali Gogoi, "Low-Cost Wi-Fi Sensing: Challenges, Advances, and a Framework for Edge Deployment," International Journal of Research Publication and Reviews, Volume 6(7), 2025, Pages 5735-5740, DOI:10.55248/gengpi.6.0725.2708
- ❖ Elvin Lalsiembul Hmar, Bornali Gogoi, Nelson R Varte, "A Comprehensive Survey on Sign Language Recognition: Advances, Techniques and Applications," International Journal of Engineering Research & Technology (IJERT), Volume 14(8), 2025
- ❖ Manjit Kumar Nath, Debopoma Nath, Rupshikha Saikia, Nelson R Varte, Bornali Gogoi, "IOT-Based Real-Time Air Quality Monitoring System Using ESP8266," International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS), 2025, Volume 14(3), Pages 151-155, DOI: 10.51583/IJLTEMAS.2025.140300019
- ❖ Mriganka Mohan Bora, Rongdeep Pathak, Nelson R Varte, "Summarizer AI Service-Document Summarization Model Using BART", International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS), 2025, 14(11), 965-970, DOI: 10.51583/IJLTEMAS.2025.1411000093
- ❖ Nelson R Varte, Rongdeep Pathak, "Ethical Challenges and Responsible Practices in AI-Assisted Web Engineering: A Structured Review and Framework," International Journal of Research Publication and Reviews, Volume 6(12), 2025, Pages 7319-7325, DOI: 10.55248/gengpi.06.1225.42110
- ❖ A. Borah and P. Barman. "Detecting anomalous degradation behaviour in lithium-ion batteries: A deep learning approach." Journal of Energy Storage, Elsevier, 132, pp. 117425, 2025.
- ❖ Chinmoy Sailendra Kalita, Maushumi Barooah, "QEEH: Adaptive Energy-Efficient Handover for FANETS Using Q-Learning," i-Manager's Journal on Wireless Communication Networks, Volume 14, Issue 1, DOI 10.26634/jwcn.14.1.22130
- ❖ Chinmoy Sailendra Kalita, Maushumi Barooah, "Dynamic Q Learning Based Handover in VANETs: An Approach for Li Fi Based Handover Techniques," Journal of Intelligent Communication, Volume 4, Issue 2, Page 26–39, DOI.org/10.54963/jic.v4i2.1496.
- ❖ Chinmoy Sailendra Kalita, Maushumi Barooah, "A Survey on Handover Techniques, Challenges, and Evolving Solutions for FANETS, International Journal of Advanced Networking and Applications, Volume 17 Issue 1 Pages 6778-6787 ISSN: 0975-0290

### ■ Conference:

- ❖ Pinky Saikia Dutta, Amrita Bose Paul, Subhrajyoti Bordoloi, "Comparative Analysis of Hybrid Machine Learning Models for Crop Yield Prediction", In the 6th International Conference on Recent Advances in Information Technology (RAIT), Indian Institute of Technology Dhanbad, India, IEEE Xplore (2025), Pages: 1-6, doi:10.1109/RAIT65068.2025.11089382
- ❖ Mala Ahmed, Amrita Bose Paul, Jyoti Prokash Goswami, "Reliable Communication in Opportunistic Network based on Trust: A Review", In the 3rd International Conference on Intelligent Systems, Advanced Computing and Communication (ISACC), Assam University, Silchar, IEEE Xplore, (2025), Pages: 1367-1372, doi:10.1109/ISACC65211.2025.10969172
- ❖ Pinky Saikia Dutta, Amrita Bose Paul, Subhrajyoti Bordoloi, "Advancing Crop Yield Forecasting Through Boruta-Based Feature Refinement in Light GBM and Stacking Models", In the 3rd International Conference on Advanced Computing, Machine Learning, Robotics and Internet Technologies (AMRIT-2025), Assam University, Silchar, Springer (2025)
- ❖ Varte N.R., Patowary M.; Roy R.; Hazarika K.; Chutia P.; Saikia N.; Bhattacharyya K., "Animal Detection and Alert System for Road Safety," 2025 IEEE Guwahati Subsection Conference (GCON 2025), 2025, Itanagar, DOI: 10.1109/GCON65540.2025.11173390
- ❖ Malakar, A., Ganguly, A., Bhattacharjee, B. : "Retinal Vessel Segmentation and Disease Detection: A Comparative Study of Deep Learning Networks", 12th International Conference on Microelectronics Circuits and Systems (Micro-2025) jointly organized by Applied Computer Technology, Kolkata and Department of Information Technology, Jalpaiguri Government Engineering College, Jalpaiguri , West Bengal. May 10 - 11 2025.

### ■ Book Chapters:

- ❖ Sangeet Baruah; Srimanjyoti Dutta; Akash Chetia; Manash Pratim Das; Simantika Choudhury; Navajit Saikia; Nelson R. Varte, Chapter: 70, "Helmet and Number Plate Detection Using Different YOLO Algorithms," In book -International Conference on Advances in Sustainable Development, Innovation and Green Technology (ICASDIGT-2024), Publication Date : 2025, Publisher: Nova Science Publishers, Inc. New York, ISBN: 979-8-89530-527-0
- ❖ Malakar, A, Ganguly, A & Chakraborty, S. K. (2025) Analysis and Characterization of Multi-Eye Diseases Using Deep Learning Algorithms, Advanced Computing and Intelligent Technologies pp (817-840). Springer Nature Singapore, DOI : <https://doi.org/10.1007/978-981-96-4933-4>

## FACULTY ACTIVITIES/ACHIEVEMENTS

### Dr. Subhrajyoti Bordoloi

- ◆ Chairman, Board of Studies committee of Computer Applications, ASTU, Guwahati, Assam
- ◆ Acted as an External Expert, Board of Study (School Board) of Royal School of Information Technology, The Assam Royal Global University, Assam, Guwahati, Assam-781035
- ◆ Acted as an External Expert, Faculty Recruitment Interview in The Assam Royal Global University, Assam, Betkuchi, Guwahati, Assam.
- ◆ Participated as an expert in the discussion on "Effect of AI: Present and Future" in 4th National Barpeta Book and Science Fair on December 8, 2025.

### Dr. Jyoti Prokash Goswami

- ◆ Attended a one-week FDP on "Recent Advances in AI and ML: Bridging Research and Industry", held from 15th to 20th December 2025 organized by the Birla Institute of Technology, Mesra, Jaipur.
- ◆ Evaluated a PhD thesis for the Assam Down Town University.
- ◆ Acted as an External Examiner for PhD viva-voce for the Assam Down Town University.
- ◆ Member of Doctoral Committee of PhD Final Viva -Voce Examination for Assam Science and Technology University (ASTU).

**Dr. Amrita Bose Paul**

- ◆ Completed one week Faculty Development Program on "Sustainable Innovation in New Ventures", organized by Department of Mechanical Engineering & Institute Innovation Council, Assam Engineering College from 27th October to 1st November 2025.
- ◆ Chaired a session at the 3rd International Conference on Intelligent Systems, Advanced Computing and Communication (ISACC 2025), held on February 27-28, 2025, Dept. of Computer Science and Engineering, Assam university.
- ◆ Served as a Subject Expert of the Board of Studies (BoS) meeting at Digboi College in finalizing the UG syllabus (FYUGP) of Computer Science under the guidelines of NEP 2020, held on 23rd May 2025
- ◆ Reviewed the proposed curriculum of Certificate program (3 months), Intensive Advanced Certificate (6 months), Postgraduate Diploma (12 months) in Cyber Security offered by Department of Computer Science and Engineering, Girijananda Chowdhury University, Assam
- ◆ Invited Expert for the Screening/Selection Committee Meeting for promotion through Career Advancement Scheme of University teachers from the Department of Information Technology, Gauhati University, held on 7th August, 2025
- ◆ Completed one week Faculty Development Program on "Sustainable Innovation in New Ventures", organized by Department of Mechanical Engineering & Institute Innovation Council, Assam Engineering College from 27th October to 1st November 2025.
- ◆ Invited Expert for the Screening cum Evaluation Committee Meeting for promotion through Career Advancement Scheme of University teachers from the Department of Information Technology, Gauhati University, held on 6th November, 2025
- ◆ Member of Board of Studies (BoS), Faculty of Computer Applications, Assam Science and Technology University, to design and finalize the Course Curriculum of 4-year BCA program as per NEP-2020 guidelines.

**Dr. Bornali Gogoi**

- ◆ Attended one Week International Online Faculty Development Programme on 'Outcome Based Education and Application of Generative AI in Teaching and Research', organised by The Internal Quality Assurance Cell (IQAC) of Carmel College (Autonomous), Mala, Thrissur in association with The Collegiate Education Department, Government of Kerala from 20th February 2025 to 28th February 2025
- ◆ Participated in Short Term Training Program (STTP) on 'Foundations of Machine Learning to Design AI Systems Using Python organized by the Centre for Artificial Intelligence and Machine Learning for Applications (CAIMLA)', by National Institute of Technology Silchar, from 19-05-2025 to 01-06-2025.
- ◆ Participated in One Week FDP on Artificial Intelligence and Machine Learning organised by Department of Computer Science and Engineering, Rajiv Gandhi University in association with Pantech e Learning held on 15 - 19 September 2025.
- ◆ Attended One-Week Online Faculty Development Programme (FDP) on "Sustainable Innovation in New Ventures", organized by Department of Mechanical Engineering & Institute Innovation Council, Assam Engineering College from 27th October to 1st November 2025
- ◆ Attended One Week FDP on Recent Trends and Future Perspective of AI in Image Processing - Tools, Techniques and Applications: Research Perspective, organised by Dept of ECE, S. A. Engineering College in association with Pantech Solutions Pvt. Ltd. from 13 - 17 October 2025

- ◆ Participated One Week AICTE Recognized Faculty Development Programme on Preparing Students for Placements and Higher Studies Conducted by Curriculum Development Centre Department from 10/11/2025 to 14/11/2025 organised by NITTTR, Chandigarh.
- ◆ Member of Body of Studies (BoS), Department of Computer Applications, Morigaon College, Morigaon, Assam for update the syllabus of Computer Applications department in line with NEP 2020.

### Nelson R. Varte

- ◆ Varte N.R., Patowary M., Roy R., Hazarika K., Chutia P., Saikia N., Bhattacharyya K., "Animal Detection and Alert System for Road Safety," 2025 IEEE Guwahati Subsection Conference (GCON 2025), 2025, Itanagar, DOI: 10.1109/GCON65540.2025.11173390.
- ◆ Presented a paper titled "Animal Detection and Alert System for Road Safety" at IEEE GCON 2025, International conference of the IEEE Guwahati Subsection during 18-20 June, 2025, NERIST, Nirjuli, Arunachal Pradesh.
- ◆ Participated in a one week AICTE Training And Learning (ATAL) Academy Faculty Development Program on Chip: Design, Fabrication, Packaging & Testing from 06/01/2025 to 11/01/2025.
- ◆ Attended an one week FDP on "Artificial Intelligence and Machine Learning" held on 15th September to 19th September 2025, Organized by Department of Computer Science and Engineering, Rajiv Gandhi University.
- ◆ Participated in an FDP on Deep Learning, Gen AI, and their applications in Agriculture held on 11th August to 18th August 2025, Organized by Department of Computer Science and Engineering, Tezpur University.
- ◆ Attended an FDP on "Sustainable Innovation in New Ventures", organized by Department of Mechanical Engineering & Institute Innovation Council, Assam Engineering College from 27th October to 1st November 2025.
- ◆ Attended a Two-Week Online Evening Course on "National Capacity Building Program on Research and Publications", Organized by IIT-Dharwad, December 8-19, 2025.
- ◆ Member, Counselling cum Admission Committee for Admission into the State Government Engineering College of Assam through CEE-2025, JLEE-2025, JMEE-2025 for the session 2025-26 (No. TE[Ex]Admn-7/2024/149 dated 27.03.2025)
- ◆ Member, Development Committee for SAMARTH E-Gov suite for Technical Institutions of Assam (State Engineering Colleges and Polytechnics) vide e-File No. 301143/25 Dated Guwahati, the 18th June, 2025
- ◆ Member, Technical Team for overall management of online counselling and admission process in Government Engineering Colleges and Government Polytechnics of Assam through SAMARTH Portal for session 2025-26 (Memo No. TE(Ex) Admn-08/24/124 dated 4.03.2025)
- ◆ Coordinator, AEC-AICTE Cell (Memo No. AEC/AICTE/CELL/2422 dated 12.11.2025)
- ◆ Translation/adaption of Environmental Studies (EVS) textbook for Class IV in Hmar Medium, SCERT, Assam (No. SCERT/ACA/Textbook/EVS/170/2024/146 dated 8.12.2025)
- ◆ Member of the verification of proposed new institutions "Nagaon Engineering College" for compliance with AICTE norms, and suggesting feasible branches. (Memo No. ECF No. 630732/02 dated 22.04.2025)

### Dr. Antara Malakar

- ◆ Awarded the degree of Doctor of Philosophy (PhD) on 30th April, 2025 from The Assam Royal Global University for the thesis titled "Design and Development of Deep Learning Based Model for Prediction of Eye Diseases in India".

- ◆ Attended FDP entitled, "NEP 2020 and Higher Education in India, with special Reference to 21st - Century Teaching Learning and Evaluation Skills" organized by the UGC-MMTTC, Assam University, Silchar, during July 21 to August 20, 2025.
- ◆ Attended an AICTE recognized FDP on Outcome Based Education and teaching Pedagogy conducted by Rural Development, NITTTR Chandigarh, from January 20 to January 24, 2025 at Assam Engineering College, Guwahati.
- ◆ Attended FDP on Advanced Optimization Techniques using MATLAB jointly organized by MNIT Jaipur from February 17 to 28, 2025.
- ◆ Participated in FDP on Quantum Technologies & Applications, jointly organized by MNIT Jaipur and various IITs from February 28 to March 22, 2025.
- ◆ Participated in FDP on Foundations of Quantum Technologies, jointly organized by MNIT Jaipur and various IITs from April 11 to May 03, 2025.
- ◆ Attended FDP on Basics of Quantum Programming, jointly organized by MNIT Jaipur and various IITs from May 16 to June 07, 2025.
- ◆ Attended FDP on Quantum Computations, jointly organized by MNIT Jaipur, NIT Patna, IIT Roorkee, IIT Guwahati, IIITDM Jabalpur, NIT Warangal from July 11 to August 02, 2025.
- ◆ Participated in FDP on Quantum Communications, jointly organized by MNIT Jaipur, NIT Patna, IIT Kanpur, IIT Guwahati, IIITDM Jabalpur from August 18 to September 11, 2025.
- ◆ Attended STTP on Pedagogical Practices for Teaching - Learning under OBE organized by NITTTR Kolkata from 28th to 2nd May 2025
- ◆ Engaged by member secretary, AESRB, in document verification of the candidates to the post of assistant Professor (Technical/Non-Technical) in the Govt. Engineering College.
- ◆ Officer designated for checking of PO's diary in Distribution and Receiving of Polling Material Panchayat Election under Kamrup District (South Bank), 7th and 8th May 2025
- ◆ Nominated by DTE to implement employability skill job ready course.
- ◆ Completed Faculty Orientation Program conducted by Wadhvani Foundation on 21st Century Employability Skills Course and recognized as "Faculty" of this course.
- ◆ Deputed as Evaluators to evaluate the Answer Scripts of the Computer Skill Test under State Level Recruitment Commission (SLRC) for Class - III posts which was completed on 5th July 2025.

**Dr. Anindita Borah**

- ◆ Participated in one month Faculty Induction Programme (FIP) on "NEP-2020 and Higher Education in India, with Special Reference to 21st-Century Teaching, Learning, and Evaluation Skills" organized by UGC-MMTTC, Assam University, Silchar during July 21st to August 20th, 2025.
- ◆ Attended one week Faculty Development on "Pedagogical Practices for Teaching- Learning under OBE" organised by NITTTR Kolkata from 28th April to 2nd May, 2025
- ◆ Attended one week FDP on "Preparing Students for Placements and Higher Studies" conducted by Curriculum Development Centre Department from 10th November to 14th November, 2025
- ◆ Reviewer of paper entitled "Air Quality Prediction-based Big Data Analytics using Hebbian Concordance and Attention-based Long Short-term Memory" for Springer Nature Scientific Reports in the year 2025

**Dr. Maushumi Barooah**

- ◆ Acted as the paper setter and moderator for Assam Public Service Commission Examination.

## STUDENT ACTIVITIES / ACHIEVEMENTS

### ◆ Merit Awardee List 2025

Semester	Name	Award
1st Semester	Tiniba Mazumdar	Topper
2nd Semester	Tiniba Mazumdar	Topper
3rd Semester	Rimli Shome, Rinku Moni Borah	Topper
Final Semester	Biptu Das	Dr. Madhab Ch. Bora Memorial Award

### ◆ Placement Record of MCA Batch 2023-25

Student Name	Organization	Placement Through
Bikul Baruah	Dhanshri Valley Public School	Off-Campus
Debopoma Nath	Sanskriti The Gurukul	Off-Campus
Ghanasyam Sarma	Drishtee Foundation	On-Campus
Himajyoti Deka	PhD in CSE, Tezpur University	Off-Campus
Raimalu Raja Narjary	Mahatma Gandhi University	Off-Campus
Rima Bhatta	Deloitte	Off-Campus
Rohit Ghosh	Littlebox India	On-Campus
Rupshikha Saikia	Renaissance Senior Secondary School	Off-Campus
Suraj Paul	TVS Credit Services LTD	On-Campus
Tanmoy Nath	Blinkit Express Store	Off-Campus
Tiniba Mazumdar	National Informatics Centre (NIC Ghy)	Off-Campus

### ◆ Industrial Internship

- ❖ The MCA 4th semester students selected in the hackathon conducted by HDFC for Jilingini Program for one full semester Industrial Internship programme in HDFC with stipend.



(Top to bottom & left to right): Ritabrat Saikia, Md. Sahil, Biswanath Tudu, Nikunja Baruah, Subhra Kinkar Deka, Ijaj Ahmed



Sneha D Bharadwaj, a Student of MCA Batch 2024-26 has been approved as an All India Radio singer in the Yuvavani section in August 2025

### ◆ Amit Pandit, MCA 3rd Semester

He is running a self-owned virtual outlet and independently designing and manufacturing electronic components such as sensors, electronic speed controllers, and customized microcontroller boards for robotic applications under the banner of **TBZ Electronics** since 2021. His self-developed products are comparable in efficiency to commercially available alternatives while being significantly more cost-effective. He has successfully used these products in robotics competitions held at various IITs, including IIT Patna and IIT Roorkee, where he secured first prizes. Additionally, he markets and sells his products to robotic communities through Instagram and WhatsApp groups.



IIT Roorkee 2025 Line Follower : 1ST Position



PYROKINESIS 2025 CONSTELLATE (RC CAR MAKING): 1st position



Amit and his Team during TECH UTSAV-25 @ AEC

### Md. Sahil, MCA 3rd Semester

- ❖ Successfully completed the ENCODERSPRO Cybersecurity Summer Internship Program, (ECSIP) - 2025, organized by ENCODERSPRO Private Limited, held from 7 June to 12 July 2025
- ❖ Successfully completed Job Ready - Employability Skills at the Basic Level on December 24, 2025 from Wadhvani Foundation
- ❖ Completed practical tasks in Cyber security from Deloitte during the period August 2025, to September 2025
- ❖ Completed Next-Gen Cyber Security Workshop on **Dark Web to AI Security** during Research & Industrial Conclave - Synergy'25 held during 10th - 12th October 2025, organised by IIT Guwahati.

**Biswanath Tudu, MCA 3rd Semester**

- ❖ Successfully completed JobReady - Employability Skills at the Basic Level on December 24, 2025 from Wadhvani Foundation.
- ❖ Completed Next-Gen Cyber Security Workshop on **Dark Web to AI Security** during Research & Industrial Conclave - Synergy'25 held from 10th - 12th October 2025, organised by IIT Guwahati.
- ❖ Got 3rd Price in Pixel Clash held under Tech Utsav'25 organised by MSSC, AEC on January 28, 2025

**Rohit Chetri, MCA 3rd Semester**

- ❖ Successfully completed JobReady - Employability Skills at the Basic Level on December 24, 2025 from Wadhvani Foundation.
- ❖ Completed Next-Gen Cyber Security Workshop on **Dark Web to AI Security** during Research & Industrial Conclave - Synergy'25 held from 10th - 12th October 2025 organised by IIT Guwahati.

**Samiran Sharmah, MCA 3rd Semester**

- ❖ Completed the course on 'Python Machine Learning: From Beginner to Pro' from Udey, completed on December 13, 2025
- ❖ Completed the certificate programe on 'Dart Mastery - Become a Dart Master from Zero to Hero' from Udey on July 6, 2025
- ❖ Completed the workshop on "Hallucinations detection and mitigation in LLM: An Overview during Research & Industrial Conclave - Synergy' 25" held from 10th - 12th October 2025, organised by IIT Guwahati.

**Priyanuj Gogoi, MCA 1st Semester**

- ❖ Secured 3rd position in the Fresher's Chess Tournament-2025, organised by AEC Chess Club.



## ARTICLE

# From Classroom Learning to Real-World Applications: Embedded Systems in Action

Nelson R Varte

Associate Professor, Department of Computer Applications  
Assam Engineering College



We often hear about "smart" devices; smartwatches that track our health, smart cars that park themselves, and smart agriculture systems that optimize crop yields. Yet, behind every smart device lies something simple but ingenious: an embedded system. These are miniature computing units designed to perform dedicated tasks efficiently and often autonomously. Though invisible to most users, they quietly power the connected world around us.

In our department, the study of Embedded Systems forms a bridge between theory and practice. As part of the curriculum, minor and major projects take students from simple laboratory exercises to real problem-solving. What begins with blinking an LED or reading a sensor value gradually evolves into systems designed for social and industrial relevance.

## The Tools of Modern Innovation

Microcontrollers such as Arduino and ESP32 have transformed how students learn embedded systems design. Arduino offers simplicity and quick experimentation. ESP32 adds built-in Wi-Fi and Bluetooth, opening the door to IoT applications. Together, they allow students to design systems that sense, compute, and communicate using temperature, ultrasonic, motion, and image sensors.

As project scope expands, platforms like Raspberry Pi and NVIDIA Jetson Nano come into use. These compact boards support real-time image processing, machine learning inference, and data-driven automation on low-cost hardware. When combined with environmental or biomedical sensors, they form complete systems suitable for field testing and real-world deployment.

## Embedded Systems in Everyday Life

Embedded systems define modern convenience. In automobiles, they control safety mechanisms such as anti-lock braking and airbag deployment. In healthcare, wearable devices continuously monitor vital signs. In agriculture, smart irrigation and environmental sensing reduce resource waste. Household appliances, from coffee makers to air

conditioners, rely on embedded controllers to optimize performance silently in the background.

## From Student Projects to Field Applications

Recent student projects highlight the growing role of embedded intelligence. Several projects combine embedded platforms with machine learning, often described as Edge AI. One group developed a vision-based traffic monitoring system using Raspberry Pi and a lightweight object detection model to analyze vehicle flow. Another team designed an ESP32-based wearable health monitor that integrated pulse and oxygen sensors to transmit alerts through Wi-Fi. Some students implemented a sign language detection system using ESP32-CAM and Raspberry Pi, supported by Long Short-Term Memory models.

In an environmental initiative, students built an IoT-based air quality monitoring network. Multiple ESP32 nodes transmitted pollution data to a centralized dashboard, allowing campus-level observation and analysis.

The list continues to grow with each graduating batch. These projects demonstrate how classroom learning matures into field-ready prototypes addressing challenges in urban management, healthcare, and environmental monitoring.

## Intelligence at the Edge

Computation is moving closer to data sources. Traditional systems relied on cloud servers for analysis. Modern embedded devices now process data locally, reducing latency and energy consumption. This shift defines Edge AI. Intelligence resides within the device itself.

Platforms such as ESP32, Raspberry Pi, and NVIDIA Jetson Nano support this transition through optimized neural networks. Techniques like model quantization reduce computation while preserving accuracy. Frameworks such as TensorFlow Lite and ONNX Runtime allow neural networks to run efficiently using reduced-precision arithmetic.

Devices like the Jetson Nano support near real-time object detection, species recognition, and human

activity analysis at the edge. Environmental researchers could deploy autonomous camera traps in wildlife reserves without continuous internet access. Similarly, portable diagnostic units can analyze patient data locally, improving healthcare delivery in remote regions.

### The Broader Impact

Embedded systems influence transportation, healthcare, agriculture, energy, and education. Their strength lies in efficiency, reliability, and task-specific design. These systems operate continuously on minimal power while improving sustainability through optimized resource usage.

Equally important is their educational impact.

Embedded systems training develops analytical thinking and problem-solving skills. Students learn to design systems with purpose and responsibility.

### Conclusion

Every embedded system represents transformation. Circuits and code evolve into insight and impact. As technology grows more connected, embedded systems will continue to shape a future grounded in intelligence, efficiency, and human-centered design.

The journey from classroom experiments to real-world applications reflects the essence of engineering education. When students see their systems assist doctors, support farmers, or protect ecosystems, learning becomes meaningful.

## How Discipline Builds a Life That Works

### Dr. Bornali Gogoi

Professor, Department of Computer Applications  
Assam Engineering College



'Discipline is the bridge between goals and accomplishment.' - as described by Jim Rohn (1930-2009), who was an iconic American entrepreneur, author, and motivational speaker who influenced millions including Tony Robbins (America's top results coach) and Mark R. Hughes (Herbalife founder).

We often mistake discipline as the antithesis of a vibrant college life. But without it, we don't gain freedom, we succumb to chaos. Our attention gets fragmented by every ping, our energy drains into reactive mode, and our goals remain uncompiled. Discipline is our **personal firewall**. It's writing our own script for the day, instead of letting deadlines and distractions write it for us.

### Attention: Our Most Valuable Resource

Our scarcest asset isn't time; it's **focused attention**. Alexander Graham Bell said "Concentrate all your thoughts upon the work in hand. The sun's rays do not burn until brought to a focus." Every notification is a context switch, and research shows it takes over 20 minutes to regain deep focus after an interruption. For a person, it's like a corrupted process halting our entire system.

Modern discipline is **attention stewardship**. It looks like:

- Putting the phone on 'Do Not Disturb' during a 2-hour lab study session.

- Using website blockers during project work to mute digital noise.
- Defending "**focus blocks**" in the calendar as we would a crucial viva.
- This isn't being rigid; it's being strategic. We are optimizing the cognitive RAM for the complex tasks that matter.

### Pre-Decision: The Algorithm for Consistency

We have goals, ace that quiz, build a standout portfolio, prepare for placements. The barrier is no longer information; it's **consistent execution**.

True discipline is **behavioural design**. It's engineering the environment:

- **Habit Stacking:** "After my morning coffee (existing), I will review one lecture topic (new)." Anchor new routines to established ones.
- **Automate Choices:** Pack the bag the night before. Meal prep on Sundays. Schedule weekly revisions. Reduce **decision fatigue**-the enemy of willpower.
- **The Pre-Decision:** Before opening Instagram, decide to scroll for only 5 minutes. Before a party, decide to leave by midnight to study. This sets our brain's path, so not to debug poor choices later.

### Self-Compassion: The Essential System Reboot

The old model of discipline says: "You failed. Try harder." But new model says: "**The system glitched. Reboot.**"

Research shows **self-compassion** is a stronger motivator. It's the discipline to pause, diagnose the issue without judgment ("I overloaded my schedule"), and iteratively improve our system. It's like hitting Ctrl+Z on a bad day, not force-quitting the entire program.

### The Compiled Output: Integrity & Resilience

Beyond GPAs and placements, discipline builds something foundational - **integrity**. It's the alignment between what we say we will do and what we actually

execute. Each time we keep a promise to ourself, finishing that assignment draft, sticking to the study timetable, our strengthen the trust in our own capability. This **self-trust** becomes the **core code** for resilience during crunch time and placements.

Discipline, therefore, is not a constraint. It is the **quietefficient code** that compiles our **efforts into a degree, a skill set, and a professional identity**. It's the user interface for a life of purpose, not panic.

**Lets' start our next sprint tonight.** Decide our screen-off time. Place our phone out of reach. Make one pre-decision. Observe the output. Then, iterate. Our future isn't found in a trending feed; it's built, line by line, in the focused sessions we protect and the promises we keep to ourself.

## THE BOY WHO REFUSED TO BREAK: Helu's Remarkable Journey from Assam to Entrepreneurship

Firojul Haque  
MCA Batch 2003-06  
Entrepreneur



By the time most young graduates are searching for secure jobs, **Helu**, a boy from a modest middle-class family in Assam, an MCA 2003 graduate of Assam Engineering College, had already set his sights on something far more ambitious. After completing his post graduate degree, he landed in Delhi-not to chase comfort, but to pursue a vision larger than anything he had ever known.

Delhi, however, tested him from the very beginning. **Once, he returned his metro card just to gather enough money to survive the day.** But even in those moments of struggle, Helu held onto a belief that steered him forward: "**Main sirfdaal-roti khane Delhi nahiaayahoon...**"

Years later, when his employer asked him to resign, it could have been the end of his journey. Instead, Helu requested one last chance-a chance that elevated him to the role of **CTO in the same company before resigning.** His rise was a story of grit, patience, and pure determination.

But success came with its own set of challenges. One day, he was forced by Employer to choose: **Either leftfamily or left job.** Helu chose family without hesitation, walking away from everything he had built, ready to start again if needed.

What followed was the chapter that truly defined his life.

After marriage, Helu found a partner whose strength matched his own vision. When their company fell into financial crisis, his wife made a quiet but powerful sacrifice-**selling her jewelry to ensure employees received their salaries.** Her unwavering faith held the family together, even during days when they **struggled to afford milk for their child.**

While many of his peers left Delhi in search of easier lives, Helu stayed back. He stayed to build something of his own. **Slowly, through countless sacrifices and sleepless nights, he transformed himself from a boy struggling to survive into an entrepreneur shaping his own destiny.**

Helu's life stands as a reminder that **success is rarely born out of comfort.** It grows in the soil of perseverance, sacrifice, and an unbreakable belief in one's dreams.

That was a small story including few remarkable memories of **Helu urf FIROJUL HAQUE** and his wife **CHAIRABEGUM.**

# From Code to Community: A Journey into Public Governance

Swapan Saha

MCA Batch 2020-22, Aspirational Block Fellow  
NITI Aayog's Aspirational Blocks Programme,  
District Commissioner Office, Dhubri



My professional journey after graduating from the MCA department of Assam Engineering College in 2022 has been a fulfilling transition from academic learning to real-world public service. While my academic foundation lies in computer science, data structures, and systems analysis, my career path has enabled me to apply these technical principles within the broader framework of governance and public administration.

Over the years, I have had the opportunity to engage with all three critical pillars of state administration—the Judiciary, Law Enforcement, and Rural Development—each contributing significantly to my professional growth and understanding of public systems.

## A Multidimensional Career Path

Following the completion of my post-graduation, I began my professional journey in the Dhubri Judiciary, where I gained first-hand exposure to procedural integrity, systematic documentation, and institutional accountability. This experience strengthened my appreciation for structure and accuracy.

Subsequently, I served the Assam Police, an experience that instilled discipline, resilience, and a deeper understanding of grassroots challenges related to public safety and administration.

Currently, I am serving as an **Aspirational Block Fellow (ABF)** under the **Aspirational Blocks Programme (ABP)**, a flagship initiative of the Hon'ble Prime Minister of India implemented by NITI Aayog. Working directly under the District Commissioner, Dhubri, I am actively involved in accelerating socio-economic development at the block level.

## The Intersection of Technology and Development

The Aspirational Blocks Programme focuses on five key thematic areas: Health & Nutrition, Education, Agriculture, Basic Infrastructure, and Social Development. My MCA background enables me to apply data-driven monitoring, digital reporting systems, and real-time analytics to track Key Performance Indicators and support evidence-based decision-making.

From coordinating initiatives such as **Sankalp Saptah** to optimizing development strategies, the analytical rigor imparted by Assam Engineering College helps ensure that governance outcomes reach the last mile effectively.

## Message to My Alma Mater

In the Digital India era, governance requires the active participation of technically trained professionals. I encourage students of Assam Engineering College to explore opportunities beyond conventional IT roles and contribute their analytical skills to nation-building and public administration.

I remain deeply grateful to the MCA department of Assam Engineering College for providing me with the intellectual foundation to pursue this meaningful career path. I am proud to carry forward the values of AEC while working towards the vision of a **Viksit Bharat**.

## अभी भी वो पल सुहाना लगता है

(In Loving Memory of my Late Father)

आपके जाने के बाद भी,  
कुछ लम्हे थम जाते हैं,  
जब हवा की सरसराहट में  
आपकी आवाज़ सुनाई देती है।

अभी भी वो पल सुहाना लगता है  
जब आपकी उँगली थामकर  
ज़िंदगी को समझना सीखा था,  
और डर को मुस्कान में छुपाना।

आपने सिखाया  
कि हालात चाहे जैसे भी हों,  
सर झुकाने से बेहतर है  
खामोशी से मज़बूत बन जाना।

आज जब राहें अकेली लगती हैं,  
तो एहसास होता है—  
आप गए नहीं हैं,  
आप हर सही फैसले में बसते हैं।

अभी भी वो पल सुहाना लगता है  
जब आपकी सीख  
मेरी ढाल बन जाती है,  
और आपकी याद  
मेरी ताकत।

आप नहीं हैं सामने,  
पर हर कदम में साथ हैं।

पिता—  
आप मेरी पहचान थे,  
और हमेशा रहेंगे।

# The Day We Saw a Legend

*A memory of Zubeen Garg from one of his Anuragi*

**Nikita Choudhury**  
MCA Batch2018-2021  
Software Developer  
National Informatic Centre (NIC)



On 4th September 2019, I was attending my classes when someone came and said, "Oi, aji Zubeen da ahi ase nohoi amar yat? Janone nai! Kanchanjangha aru Ratnakar'r promotion'r karone ahise buli." We were all like, "Baddiya, aji aru class nokoru. Zubeen da ahi ase, auditorium't sabo jam!" I rushed back to my PG, quickly had lunch, and immediately took a tempo back to college. I told the driver, "Dada, joldibolok! Zubeen da ahi ase, bhir hobo tat. Deri hole bhalke dekhha napam!" The driver didn't stop anywhere or take any

other passengers. He drove straight to the college with just me in the tempo.

Later, one of my friends saw me going alone in that empty tempo and still teases me about it, saying, "Nikita a heidina Zubeen dak sabolegute tempo khon reserve kori loigoisil!" I used to laugh every time he said that.

But on the 19th September 2025, when the tragic news broke, that memory came rushing back. Suddenly, the same moment that once made me laugh left me heartbroken.

## Flashback to 4th September 2019



*The person standing and speaking on the mike, wearing a black shirt and white pant, is Zubeen.*

Zubeen Garg had arrived with Jatin Bora and the entire Kanchanjangha and Ratnakar team. There's no need to describe what the auditorium felt like when Zubeen da walked in, everybody knows it- that legendary wave of excitement. The hall exploded with positivity, cheers, and pure love.

**"Zubeen! Zubeen! Zubeen! Zubeen!"**

Seeing our Zubeen da from so close was nothing less than one of my biggest and sweetest dreams come true. The next day, or maybe the day after, they had a rally from Gauhati University for the films. When I came back to my PG, all of us were talking non-stop in our WhatsApp group "**Super30**", full of excitement

because we had finally seen Zubeen da in person, so close.

A person who loved people, animals, nature, trees, and birds with all his heart...

A soul who never differentiated between caste, religion, language, or culture...

A legend who lived not just through music, but through kindness.

His melody will remain in our hearts forever, his compassion will continue to inspire us, and his spirit will never fade from our memories. Through our love and remembrance, he will live on, not just in our hearts, but in the hearts of generations to come.

# Living Algorithms: How Biological Cells Are Being Programmed Like Software

**Khooshbu Choudhary**  
MCA 4th Semester  
Batch 2024-2026



For centuries, we believed that only machines could be programmed. Today, science is breaking that boundary. Researchers are now programming living biological cells in ways similar to software, giving rise to the concept of **living algorithms**. This revolutionary field combines biology, computer science, and engineering, changing how we understand life itself.

## Cells as Living Computers

Biological cells already follow natural algorithms. A cell senses its environment, processes signals, and responds accordingly. Scientists are now learning how to rewrite these instructions, turning cells into programmable systems. Inside every cell is DNA, often compared to a biological hard drive. It stores instructions for building proteins and controlling behaviour.

With tools like **CRISPR**, researchers can insert custom genetic "code" into DNA, which functions like if-then logic in programming. For example:

- If a cell detects a toxin, it produces a neutralizing protein.
- If cancer markers appear, the cell self-destructs or signals the immune system.

These genetic circuits operate like software loops, switches, and logic gates—except they function inside living organisms. Unlike traditional computers, biological systems evolve, self-repair, and operate efficiently on minimal energy, performing complex tasks that would require massive computational power in machines.

## Applications of Living Algorithms

One of the most exciting uses is **smart medicine**. Engineered bacteria can release drugs only at disease sites, reducing side effects. Immune cells can be "reprogrammed" to detect and destroy tumor cells, effectively debugging the immune system.

In **environmental science**, living algorithms create biosensors—cells that glow or change color when detecting pollutants. These self-repairing, low-cost detectors can replace expensive machines. In **agriculture**, crops can be programmed to conserve water, resist pests, or grow faster under stress, responding dynamically to their environment.

## Ethical and Philosophical Considerations

With this power comes responsibility. Who controls these living programs, and what if an organism mutates unexpectedly? These questions raise critical debates about bioethics, safety, and regulation. On a deeper level, living algorithms challenge our understanding of life itself, suggesting that biology may be seen as a form of computation.

## The Future of Living Code

Though still in early stages, living algorithms hold enormous potential. From curing diseases to cleaning the planet, programmable cells could become one of the most transformative technologies of the 21st century. We are entering an era where code no longer just runs on machines—it **breathes, grows, and lives**.

# Agentic AI: A New Paradigm in Artificial Intelligence

**Samiran Sharmah**  
MCA 4th Semester  
Batch 2024-26



Agentic AI represents a major shift in the evolution of Artificial Intelligence, particularly in the development of Large Language Models (**LLMs**). Traditional AI systems were largely **reactive**, they generated responses only when prompted by a user. While

effective for tasks like question answering or text generation, they lacked independence, long-term reasoning, and decision-making ability.

Agentic AI introduces the concept of **agency**, which allows an AI system to act autonomously toward

achieving a defined goal. Once a goal is provided, an agentic system can perform **task decomposition**, breaking a complex objective into smaller, manageable subtasks. It then creates a plan, executes actions, observes outcomes, and improves its strategy through feedback. This capability makes Agentic AI closer to human-like problem solving.

A core structure behind Agentic AI is the **agent loop**, which consists of goal formulation, planning, action execution, perception, and self-correction. **Perception** refers to the agent's ability to observe its environment, such as reading error logs, system outputs, or test results. Based on this perception, the agent decides its next action from a defined **action space**, which may include writing code, running tests, searching documentation, or calling APIs.

Another essential feature of Agentic AI is **autonomy**. Unlike traditional LLMs that require constant user input, agentic systems can operate independently for extended periods. However, this autonomy is usually combined with a **Human-in-the-Loop (HITL)** approach, where humans supervise or intervene when necessary to ensure safety and correctness.

Agentic AI systems operate within an **environment**, which may include software tools, operating systems, browsers, databases, or development platforms. Interaction with this environment is enabled through **tool usage**, allowing the agent to perform real-world actions rather than just generating text. Memory management also plays an important role: short-term memory helps maintain current context, while long-term memory enables learning from past tasks.

From a safety perspective, **alignment** is a critical concept. Alignment ensures that the goals and actions of the agent remain consistent with human intentions and ethical values. Without proper alignment, autonomous systems may produce unintended or harmful outcomes. Therefore, most practical agentic systems balance autonomy with control mechanisms.

### Example: Agentic AI in Software Development

Agentic AI is increasingly used in software engineering, where it functions as an autonomous development assistant:



**Cognition AI - Devin:** Plans, writes, tests, and debugs complete software projects like a junior software engineer.



**OpenAI Codex (Agent-based):** Executes commands, writes programs, and iteratively fixes errors until tasks are completed.



**GitHub Copilot Workspace:** Converts issues into structured development plans and performs multi-file code changes.



**Sourcegraph Cody:** Understands large codebases and assists in refactoring and architectural changes.



**Replit AI Agents:** Builds, runs, debugs, and deploys applications directly from natural language instructions.

These systems demonstrate how Agentic AI transforms traditional coding assistants into **autonomous software development agents** capable of handling end-to-end work flows.

## An Overview of Termux and Its Applications on Android

**Biswanath Tudu**  
MCA 4th Semester  
Batch 2024-2026



Every operating system provides a terminal that allows users to access the core functionality of the system. Desktop operating systems come with built-in terminals such as Command Prompt and Power Shell in Windows, and Bourne Shell or Bash in Linux. Similarly, **Termux** provides a Linux-like terminal environment for Android devices.

Termux is an Android application that allows users to run a command-line interface on their smart phone. It enables the installation of programming environments and execution of scripts using languages such as

Python, Bash, and Git. This makes Android devices capable of performing tasks similar to a Linux system.

### How to Download Termux

Termux is available on the Google Play Store; however, the Play Store version has limited repositories and fewer features due to policy restrictions. For the latest and fully functional version, it is recommended to download Termux from **F-Droid**.

Link: <https://f-droid.org/en/packages/com.termux/>

### How to Use Termux

Termux provides a Linux-like command-line interface. Users with basic knowledge of Linux commands can easily use it. Beginners can learn from the many tutorials and documentation available on the internet.

### Why Use Termux

- ◆ **Easy Installation:** No complex setup is required. Simply install and start using it.
- ◆ **Large Package Repository:** Users can install required packages easily.
- ◆ **Git and GitHub Support:** Git repositories can be cloned and managed.
- ◆ **Regular Updates:** Packages are updated frequently.
- ◆ **Programming Language Support:** Supports C/C++, Python, PHP, Go, Lua, Perl, etc.
- ◆ **Database and Server Support:** Supports Maria DB, Apache, Nginx, and Ngrok.

- ◆ **Cybersecurity Tools:** Tools like Nmap, Metasploit Framework, Hydra, and others can be used for learning cyber security concepts.

### Community Support

Termux has a large user community. Solutions to most problems can be found through forums, GitHub, and online discussions.

### Is Termux Safe?

The official Termux application is safe to use if used responsibly. Users should avoid running untrusted scripts that may harm the device. Termux does not require special permissions unless access to device storage is needed.

### Conclusion

Termux is a powerful and portable tool for IT students, programmers, and technology enthusiasts. It allows users to practice programming, server management, and cyber security using only a smart phone. As a free and flexible platform, Termux is highly beneficial for learning and experimentation.

## Catastrophic Forgetting: On Algorithms, Adulthood, and the Things We Leave Behind

Ijaj Ahmed  
MCA 4th Semester  
Batch 2024-2026



There is a quiet sorrow in learning. Not the sorrow of ignorance, which is merely a void waiting to be filled, but the heavier sorrow of erasure, the realization that to know something new, we often sacrifice something old.

In the discipline of artificial intelligence, we call this **catastrophic forgetting**. It is a tendency in neural networks to abruptly forget previously learned information upon learning new information. The model, obsessed with minimizing error in the present, overwrites the weights of the past. It treats its history not as a foundation, but as hard drive space to be reclaimed.

I witnessed it while training a model. With each new dataset, it grew sharper, and yet, strangely emptier.

Its earlier lessons vanished, not in rebellion, but in obedience to progress.

And there, in that silent failure of memory,

I saw the reflection of a human life.

### The Epoch of Wonder

We began as systems with infinite plasticity. As children, our "training data" was small, yet our capacity to process it was boundless. We learned

without the paralyzing fear of the error function. We asked questions without calculating the social cost. A stick was Excalibur; the hallway was a dungeon; tomorrow was a promise, not a deadline.

We were generalists of the highest order. We remembered everything: the specific texture of a grandmother's sari, the smell of rain on hot asphalt, the absolute certainty that we could fly if we just jumped correctly. Our minds were not optimized for the market. They were optimized for *being*.

### The Overwrite

Then came the updates. Adulthood arrived not as a gradual slope, but as a massive, noisy dataset, unforgiving and relentless.

The parameters changed. Wonder was replaced by utility. Grades turned into CGPA; CGPA turned into CTC. The world, acting as a strict loss function, punished us for daydreaming and rewarded us for compliance. We fine-tuned ourselves to survive.

But the brain, like the network, has limited capacity. In learning how to be efficient, we overwrote the code for curiosity. In learning to be "professional," we pruned

the weights that made us gentle. We became specialized, potent, and successful engines of production. But if you asked us to retrieve the joy of a Tuesday afternoon with no agenda, the query would return a null value.

### The Stability-Plasticity Dilemma

In computer science, we try to solve this with a concept called the **stability-plasticity dilemma**. A system must be plastic enough to learn new things, but stable enough to preserve existing knowledge.

Humans, however, are often taught only plasticity. We call it "growing up," or "being practical." We view the shedding of our past selves as a necessary tax for the future. The artist becomes the engineer; the poet becomes the analyst. We tell ourselves these were just phases, distinct epochs that have ended.

But this is a design flaw. A neural network that forgets its past training is considered "broken." Why do we accept it as "maturity" in ourselves?

The tragedy is not that we change. The tragedy is that we change by deletion rather than expansion.

### Experience Replay

How do we fix the code? In deep learning, one solution is **experience replay**. We force the model to revisit old examples intermittently, mixing the past in with the

present, ensuring the new patterns don't drown out the old wisdom.

Life offers us the same remedy, though it requires more courage than code.

It demands that we deliberately access the old files. To pick up the book that changed you at sixteen. To ask a question that sounds foolish. To prioritize a sunset over a syllabus, not because it is productive, but because it stabilizes the soul.

To look backward is not to regress. It is to remind the system of who it is.

### The Final Optimization

My model eventually failed that day. It became too specialized, too narrow, too new. It taught me that the greatest intelligence is not the speed at which we process the future, but the grace with which we carry the past.

As students of technology, we spend our days teaching machines how to think. But as students of life, our task is harder. We must design an architecture for ourselves that allows us to grow without erasing.

We must remain the child who believed the world was waiting, even as we become the adult who builds it. Because progress without memory is not evolution. It is just data loss, masquerading as advancement.

## তোমালে মনত পৰে

সন্ধ্যা পৰত তোমালে মনত পৰে  
বৰষুণৰ টোপালত  
তোমালে মনত পৰে  
ভাঁহি আহে তোমাৰ সোণালী সুবাস,  
মেঘৰ মাতত খুন্দা মাৰে  
তোমাৰ অনুভৱ  
সেমেকা বতাহে কঢ়িয়াই  
মোৰ জীৱনত তোমাৰ সেই অস্তিত্ব  
আন্ধাৰত জোনাকী পৰৱৰ্ত্তাৰ পোহৰে দিয়ে,  
তোমাৰ সৌন্দৰ্য্য ব্যাখ্যা  
বন্ধ কোঠাৰ নিস্তন্ধতাই সোঁৱৰাই  
তোমাৰ মাতৃটোৰ প্ৰয়োজনতা  
কুঁৱলীৰ দৰে নামি আহিবানে আকৌ  
জীপাল হব মোৰ বিজ্ঞ হৃদয়,  
আকৌ যেন পৰশ পাব মোৰ মনে  
শেৰালি খিলিব বুকুৰ কোণত  
পখিলাই হাহিব...  
ভোমাৰাই বহিব...  
ৰঙীণ হব উকা হিয়া...  
আকৌ এবাৰ আহিবানে ?

Tofajul Haque  
MCA 2nd semester  
Batch 2025 - 27



## সৌন্দৰ্যৰ ব্যাখ্যা

হাঁহিটো মৰম লগা তোমাৰ,  
ৰাতিপুৱাৰ শেৰালিপাহ সদৃশ  
নীৰে চাই যেন থমকি ৰঙ।  
বেলিফুলৰদেৰ চকু দুটাই যেন মায়া সানে,  
মোৰ দৰে ফুল ভাল পোৱাজনৰ চকুত  
খঙত পদুমৰদৰে উফন্দি উঠা মুখনি  
কিমানযে অমায়িক,  
নীৰে চাই যেন আকৌ থমকি ৰঙ।  
ফুলিথাকা ফুলৰ উদাহৰণহৈ  
তোমাক ব্যাখ্যা কৰিবলৈ পায় যেন  
মোৰ কলম বহুত সুখী।

## A TRIBUTE TO THE LIVING LEGEND



*"Zubeen Garg: The voice that was Assam's heart, his melodies forever echoing our pride, pain, and boundless spirit."*



Two display boards were thoughtfully designed by Dipsikha Koch and Principriya Gogoi, 3rd Semester MCA students, under the supervision and guidance of Dr. Maushumi Barooah and Dr. Subhrajyoti Bordoloi, to pay a respectful tribute to the Legend. They have beautifully portrayed his life, values, and enduring legacy, creating a touching space for reflection and remembrance. It deeply resonated with faculty and students alike, fostering a shared sense of respect, gratitude, and collective remembrance.



PHOTO GALLERY



MCA Batch (2023-25) with Faculty & Staff Members



MCA Batch (2024-26) with Faculty & Staff Members



MCA Batch (2025-27) with Faculty & Staff Members

সংগনক

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