

DIBAKAR ROY

 Portfolio |  dibakar0804 |  roy056 |  Google Scholar

Panchagarh, Rangpur, Bangladesh

RESEARCH INTERESTS

- Brain-Computer Interfaces (BCI)
- Intracortical Speech Decoding
- EEG Signal Processing
- Cross-Session Neural Adaptation
- Neural Engineering
- Neural Signal Processing
- Biomedical Machine Learning
- Adaptive Neural Decoding

EDUCATION

- **Rajshahi University of Engineering & Technology (RUET)**
BSc. in Electrical & Computer Engineering
◦ CGPA: **3.39 / 4.00** | (Last 60 Credits: **3.99 / 4.00**)
March 2022 - July, 2026
Rajshahi-6204, Bangladesh

RESEARCH EXPERIENCE

- **Thesis Research – Rapid Parameter-Efficient Calibration for Cross-Session Intracortical Speech Decoding**
 - Developed a cross-session intracortical speech decoding framework on the public T12 and T15 datasets using strict chronological training, validation, and held-out future-session evaluation.
 - Designed a parameter-efficient input-space calibration strategy that updates only 65,792 parameters (<0.05% of the complete decoder) while keeping the high-capacity BiGRU sequence encoder and CTC classifier frozen.
 - Reduced macro phoneme error rate on T12 by 11.37% and 15.51% using 40 and 80 calibration trials, respectively, with improvement across all six held-out sessions; independent T15 evaluation achieved up to 10.05% relative improvement.
- **Baseline-Aware EEG Workload Classification with Reduced Electrodes**
 - Developed a baseline-aware, leakage-safe framework for subject-independent workload classification on EEGMAT and STEW using nested LOSO validation.
 - Evaluated reduced and shared montages, handcrafted and Riemannian features, and cross-dataset transfer, achieving balanced accuracies of 0.8199 on EEGMAT and 0.8519 on STEW.

PUBLICATIONS

- **D. Roy**, F. Tabassum, and R. Mozumder, “Rapid Parameter-Efficient Calibration for Cross-Session Intracortical Speech Decoding: Cross-Dataset Evaluation,” *Neurocomputing*, Elsevier. **Submitted; With Editor** (submitted Aug. 16, 2026).
- **D. Roy** and F. Tabassum, “Fast Label-Free Cross-Session Calibration for Intra-Cortical Speech Decoding,” 2026 
• *IEEE 2nd International Conference on Quantum Photonics, Artificial Intelligence & Networking (QPAIN)*, Chittagong, Bangladesh, 2026, pp. 1–6.
- **D. Roy**, D. Dhar, and R. Mozumder, “Baseline-Aware Practical Framework for EEG Workload Classification with Reduced Electrodes Across Multiple Datasets,” *International Conference on Electrical, Computer and Communication Technologies (ECCCT)*, 2026.
Accepted and presented; camera-ready manuscript submitted in Taylor & Francis book-chapter format for publication.
- M. R. Maksud, **D. Roy**, P. R. Dipa, and M. A. H. Pramanik, “Hardware-Aware RIS-Assisted ISAC with Quantized Feedback: A Robust Deep Reinforcement Learning Framework,” 2025 28th International Conference on Computer and Information Technology (ICCIT), Cox’s Bazar, Bangladesh, 2025, pp. 5590–5595. 
- M. R. Maksud, **D. Roy**, M. M. Hussen, M. K. Ghosh, and M. F. Ahamed, “Learning-Augmented RIS-Aided Hybrid Beamforming for Secure and Low-Latency Transmission,” 2025 7th International Conference on Electrical Information and Communication Technology (EICT), Khulna, Bangladesh, 2025. 

ACADEMIC PROJECTS

- **Event Management Website (Software Project II)** 
2024, RUET
 - Built a centralized departmental event management system with admin/user dashboards, secure authentication, and real-time updates.
 - Implemented using Next.js and the MERN stack with role-based access control and email verification.
- **Woman Safety Device (Electronic Shop Practice)**
2023, RUET
 - Designed an ESP32-based safety device integrated with a custom Android SOS app via Bluetooth.

- Implemented live GPS location sharing, incident logging for analysis, and a built-in taser for primary self-defense.

- **Nutrition Website (Software Project I)**

2023, RUET

- Developed a health-focused web platform for BMI, BMR, and daily calorie estimation based on user activity.
- Implemented OTP-based email verification for secure user registration and login.

EXPERIENCE

- **Industrial Trainee**

BJIT Ltd.

March 2025

Dhaka, Bangladesh

- Completed industrial training at BJIT Academy with hands-on exposure to SDLC and Agile/Scrum practices.
- Developed Python-based applications including an OOP-driven Library Management System and a Task Manager with JSON persistence.
- Gained practical experience with Git/GitHub, software quality assurance concepts, and team-based software development.

SKILLS

- **Programming:** Python, MATLAB, C++, JavaScript
- **Signal Processing:** MNE-Python, EEG preprocessing, spectral analysis
- **Research Tools:** Git, GitHub, L^AT_EX, Overleaf, Jupyter, VS Code
- **Engineering & Design Tools:** Proteus, EasyEDA, AutoCAD, AutoCAD Electrical
- **Web Development:** MERN Stack, Next.js, HTML, CSS
- **Documentation & Productivity Tools:** L^AT_EX, Microsoft Office

ACHIEVEMENTS

- Merit-Based Scholarship during BSc. from the Directorate of Technical Education, Bangladesh.
- General Scholarship (SSC) and Talentpool Scholarship (JSC & PSC).
- Second Runner-Up (Junior Category) in the Regional Bangladesh Mathematical Olympiad (BDMO) and participant in the National Round.
- Champion, Inter-Department Volleyball Tournament, RUET.

LEADERSHIP, SERVICE & ACTIVITIES

- **Class Representative (2nd Year)**

Department of Electrical and Computer Engineering

- Represented the class in academic and administrative matters and coordinated communication between students and faculty.

- **Volunteer**

trECento, American Center Pop-Up & Inter-Department Project Showcasing

- Supported event organization, coordination, and logistics for departmental programs, the U.S. Embassy-supported American Center Pop-Up, and university project showcases.

- **Sports**

Department of Electrical and Computer Engineering

- Represented the department in inter-department football, volleyball, fresher's football, and cricket tournaments.