

Tanvir Mahmud Mahim

Lecturer | [BRAC University](#) | Dhaka, Bangladesh

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🎓 EDUCATION

Dec 2022	B.Sc. in Electrical and Electronic Engineering (EEE), BRAC University
Jan 2019	- CGPA: 3.77/4.00 Average Marks: 86.20% Academic Honors: High Distinction - Certification: World Education Services (WES) Certified, Equivalent to a US Bachelor's Degree - Supervisor: Dr. A.H.M.A. Rahim [Retired (Dec 2024)] - Thesis: BRACU-DSpace-2023

🎓 HONORS AND AWARDS

VC's and Dean's List Award for academic excellence at undergraduate study (2020-2022)
University Merit Scholarship for academic excellence at undergraduate study (2020-2022)

💡 RESEARCH INTERESTS

- Quantum Optics and Photonics
- 2D Quantum Materials
- Microelectromechanical Systems (MEMS)
- Wide Bandgap (WBG) Semiconductor Devices
- Electronic Design Automation (EDA)
- Machine Learning (ML)

🔬 RESEARCH EXPERIENCE

Present	Quantum Optics and Photonics Dr. A.S.M. Mohsin , BRACU , EEE
July 2025	- Developed a numerical model of a photonic-molecule 4H-SiC soliton-crystal microcomb enabling squeezing extraction beyond 3 dB limit [Code] [under review] - Theoretically and numerically investigated a pick-and-place diamond micromembrane NV quantum sensor for imaging single vortices and quantifying vortex-induced losses in tantalum superconducting circuits [Code] [under review] - Developed closed-loop ML frameworks for quantum photonic instrumentation and photonic neural inference, in collaboration with the University of Memphis, USA: Closed-loop, event-driven machine learning for autonomous triage of single-photon emitters [Code] [under review]; Photon-efficient neural inference over optical links [Code] [under review] - Developed learned generative process digital twins for yield-aware inverse design of photonic sensor front-ends [Code] [under review]
July 2026	2D Materials and MEMS Dr. M. Mosaddequr Rahman , BRACU , EEE
July 2024	- Developed a TCAD-based model relating two Raman phonon signatures to fixed edge charge in monolayer semiconductor nanoribbon transistors. [Code] [under review] - Investigated the combination of strain and ferroelectricity in WSe₂ transistors for fast, low-power nonvolatile logic [Code] [under review] - Developed a fabrication-aware, physics-informed adjoint framework with RL for inverse design of CMUTs and photonic sensors. [Code], [under review], [IEEE Sensors Journal 2025]
June 2026	WBG based Electronic Devices Dr. Nadim Chowdhury , BUET , EEE
May 2025	- Developed physics-guided adjoint co-optimization of a novel monolithic E-mode GaN-on-SOI fractional-N PLL with HEMT varactor, [Code] [under review] - Collaborated with GlobalFoundries, Inc. Santa Clara, USA through the development of physics-guided graph RL framework with an adaptive fuzzy reward for transferable analog transistor sizing. [Code] [under review]
June 2024	Dynamic Control Dr. A.H.M.A. Rahim , BRACU , EEE [Retired (Dec 2024)]
May 2023	- Investigated multi-machine network control with RL-based fuzzy inference [JESTECH (Elsevier) 2026] - Developed an RL-driven fuzzy-attention inference controller for microgrids. [IEEE TFS 2025] - Developed a novel bifacial module [IEEE TENSYP 2023], [IEEE JPV 2024]

- 2026 **T. M. Mahim**, M. M. Rahman and A. S. N. Huda, "Adaptive Takagi-Sugeno-Kang Fuzzy Inference with Reinforcement Learning to Withstand Extreme Low Voltages of DFIG-WT", *Engineering Science and Technology, an International Journal*, 80, 102435 (2026). [[Paper](#)]
- 2025 **T. M. Mahim**, M. M. Rahman and A. H. M. A. Rahim, "Hierarchical Inverse Design Framework for Unit-Cell CMUTs With Attentive Gated Recurrent And Fully Connected Dense Layers", *IEEE Sensors Journal*, 25(13), 26104-26116 (2025). [[Paper](#)]
- 2025 **T. M. Mahim**, A. H. M. A. Rahim and M. M. Rahman, "Adaptive Fuzzy Attention Inference to Control A Microgrid Under Extreme Fault On Grid Bus", *IEEE Transactions on Fuzzy Systems*, 33(6), 1815-1824 (2025). [[Paper](#)]
- 2024 **T. M. Mahim**, A. H. M. A. Rahim and M. M. Rahman, "Weather Responsive Multidimensional Photovoltaic Efficiency Model for Simulation of Custom-Built Bifacial Panel", *IEEE Journal of Photovoltaics*, 14(5), 848-860 (2024). [[Paper](#)]
- 2024 **T. M. Mahim**, A. H. M. A. Rahim and M. M. Rahman, "Review of Mono- and Bifacial Photovoltaic Technologies: A Comparative Study," *IEEE Journal of Photovoltaics*, 14(3), 375-396 (2024). [[Paper](#)]

</> TECHNICAL SKILLS

TCAD & Device Simulation

DEVSIM · Synopsys Sentaurus TCAD

First-Principles & Atomistic

Density functional theory (Quantum ESPRESSO) · Wannierization (Wannier90) · Molecular dynamics (LAMMPS) · Micromagnetics (MuMax³)

Machine Learning

PyTorch · JAX, Optax, Flax · TensorFlow & Keras · scikit-learn

Multiphysics & Electromagnetics

COMSOL Multiphysics · Ansys HFSS

Circuit, Layout & EDA

Cadence Virtuoso · Keysight ADS · Xyce · ngspice · OpenVAF · GDSFactory

PROFESSIONAL EXPERIENCE

- June 2026 **Adjunct Lecturer, Department of EEE, BRACU**
- June 2025 • Courses: Solid-State Device, Numerical Methods and Microprocessor & Embedded System
- Present **Research Assistant, Department of EEE, BRACU**
- June 2023 • Collaborated with Industries and International Universities
- Provided Assistance to Capstone Projects of Several Undergraduate Groups
- June 2026 **Consultant, GIXSystems.ai, USA**
- Dec 2025 • Technology development of a 100 V GaN-on-Si power HEMT discrete device (tape-out with X-FAB, Erfurt, Germany)
- May 2023 **Teaching Assistant, Department of EEE, BRACU**
- Jan 2022 • Courses: DC & Magnetic Circuits, Energy Conversion, Signals & Systems and Control Systems

SYNERGISTIC AND LEADERSHIP ACTIVITIES

- Present **Student Member | IEEE (Institute of Electrical and Electronics Engineers)**
- Jan 2021 • [Electron Device Society \(EDS\)](#)
- [Power and Energy Society \(PES\)](#)
- Nov 2023 **Aspire Institute | Harvard University, Cambridge, USA**
- Feb 2023 • Aspire Leadership Program 2023

REFEREES

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