

Fahad Arefin

Hardware & Sensor Engineering | Laser-Induced Graphene | Semiconductor Devices

Portfolio | [linkedin.com/in/fahadarefin](https://www.linkedin.com/in/fahadarefin)

PROFILE

EEE undergraduate at the University of Dhaka focused on hardware and sensor engineering, with hands-on research in laser-induced graphene (LIG) and flexible gas sensors. Builds sensing hardware end to end, from device fabrication to embedded/IoT integration; two peer-reviewed publications and executive roles in two IEEE student organizations.

EDUCATION

University of Dhaka, Dhaka, Bangladesh
B.Sc. in Electrical and Electronic Engineering

Sep 2022 – Present
CGPA: **3.54/4.00** (7 of 8 semesters)

RESEARCH EXPERIENCE

Undergraduate Research Assistant

Present

Microsystems & Nanoengineering Lab, University of Dhaka

- Research laser-induced graphene (LIG) sensors; design experimental and characterization setups and analyze device performance.

HARDWARE & DEVICE PROJECTS

Hofmann-Type MOF on Blue-Laser-Induced Graphene for Flexible Room-Temperature NH₃ Sensing

LIG / Flexible Electronics / Gas Sensing

- Fabricated laser-induced graphene electrodes using a blue laser, forming a flexible sensing platform.
- Integrated a Hofmann-type metal–organic framework (MOF) with the LIG to realize a room-temperature NH₃ sensor; characterized and analyzed its response.

MAAS-IoT: Edge-Based Wingbeat Frequency Analysis for Real-Time *Aedes* Surveillance

Jan 2026 – Present

Optical Sensor Hardware / Embedded Edge AI

- Engineered an optical wingbeat sensor that identifies *Aedes* mosquitoes from their wingbeat frequency signatures.
- Developing the edge hardware and AIoT system that runs on-device inference to track *Aedes* population growth across an area.

PUBLICATIONS

[1] MAST-CloudNet: IoT-Enabled Acoustic Trap with Real-Time AI Surveillance of *Aedes*

IEEE Transactions on Instrumentation and Measurement — Accepted for publication.

[2] SmartDetectAI: An AI-Powered Web App for Real-Time Colorimetric Detection of Heavy Metals in Water

Advanced Intelligent Systems, Dec. 2025. DOI: [10.1002/aisy.202500642](https://doi.org/10.1002/aisy.202500642)

LEADERSHIP

Secretary (formerly Webmaster), IEEE Student Branch, University of Dhaka

- Direct day-to-day branch operations and oversee the branch's digital infrastructure.
- As Webmaster, modernized the branch website, improving member engagement and resource access.

Treasurer, IEEE Photonics Society Student Branch Chapter, University of Dhaka

- Manage the chapter's budget, funding, and financial records for technical events and activities.

Class Representative, Department of EEE, University of Dhaka

- Serve as the primary student–faculty liaison, resolving academic concerns and coordinating courses.

Events Volunteer, University of Dhaka: co-organize alumni meetups and symposia connecting students with industry.

TECHNICAL SKILLS

Devices & Materials	LIG fabrication, flexible gas sensors, MOF functionalization, device characterization
Hardware	Circuit design and simulation, sensor interfacing, optical sensing, experimental setup design
Embedded & IoT	IoT system design, edge AI deployment, C, Python
Design & Analysis	3D modeling, data analysis, Linux system administration