

Archishman Sarkar

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Research Interest

Research interests include **Semiconductor Device Physics, Photonics, Superconducting Circuits and Quantum Computing.**

Education

SSC: Chittagong Collegiate School 2015-2017

Concentration: Science

GPA: 5.00

HSC: Govt. Hazi Mohammad Mohsin College 2017 -2019

Concentration: Science

GPA: 5.00

Bangladesh University of Engineering and Technology (BUET) Feb 2020 – Feb 2025

Bachelor of Science (B.Sc.) in Electrical and Electronic Engineering

Major: Electronics

CGPA: 3.9674 / 4.00

Class Rank: 4th

Class Standing: Top 2%

Selected Coursework:

Analog Integrated Circuits and Design; VLSI Circuits and Design; Nanoscale Device Modeling and Simulation Techniques; Processing and Fabrication Technology; Compound Semiconductor Devices; Optoelectronics; Electrical Properties of Materials; Solid-State Devices; Engineering Electromagnetics; Signals and Systems; Digital Signal Processing; Digital Image Processing; Communication Systems; Control Systems; Power Electronics; Power Systems; Digital Electronics; Microprocessors and Embedded Systems; Machine Learning and Pattern Recognition.

Bangladesh University of Engineering and Technology (BUET) May 2025 – Present

Master of Science (M.Sc.) in Electrical and Electronic Engineering

Major: Electronics

CGPA: 4.00 / 4.00 (Current)

Selected Coursework:

Machine Learning and Pattern Recognition; Quantum Computing; Integrated Silicon Photonics; Nanoscale Device Modeling and Simulation Techniques; Power Semiconductor Devices; MOS Devices.

Research Experience

Actively engaged as a member of the **Nadim Chowdhury Research Group**, with a research focus on semiconductor devices.

Undergraduate Thesis: Evaluation of GaN HEMT and Si-Based Driver Performance for GaN/InGaN LEDs and Modeling of Flux-Quantizing Superconducting Circuits Nov 2023 – Mar 2025

Supervisor: [Dr. Nadim Chowdhury](#)

- **Description:** This research investigates the performance of GaN/InGaN LEDs driven by both silicon-based and GaN-based MOSFETs, with a comparative analysis of efficiency and switching behavior. In addition, flux-quantizing superconducting circuits were modeled by reproducing and validating results reported in the existing literature.

Recent Work: Currently working on the monolithic integration of GaN/InGaN LEDs with GaN HEMTs. Additional

research activities include work in the photonics domain, with a primary focus on photonic memory devices.

Additional Work: Designed and implemented a DC–DC buck converter along with its corresponding gate driver circuit.

Conference Paper: Development of a Deep Learning–Based Dual-Mode Autonomous Water Surface Trash Collector and Water Quality Analyzer.

Teaching Experience

Adjunct Lecturer, Bangladesh University of Engineering and Technology (BUET)
Department of Electrical and Electronic Engineering

April 2025 – July 2025

- Conducted and supervised undergraduate laboratory courses, including:
 - Digital Electronics Laboratory
 - VLSI Laboratory
 - Electronic Circuits Laboratory
 - Telecommunication Laboratory
 - Electrical Circuits Laboratory
 - Advanced Machines Laboratory

Industrial Attachment

Neural Semiconductor Limited

June 2024

- Completed a five-day industrial internship at Neural Semiconductor Limited, gaining hands-on exposure to **Analog Design, Digital Design, Verification**, and related semiconductor engineering activities.

Projects

12-Bit Synchronous Counter [\[Project Link\]](#)

2024

- Designed and implemented a 12-bit synchronous counter capable of binary counting from 0 to 4095, utilizing SystemVerilog, self-checking and layered testbenches, synthesis, and physical design methodologies.
- **Tools Used:** EDA Playground, Cadence Virtuoso, Cadence Innovus.

Electrical Services Design of an 8-Storied, 4-Unit Residential Building [\[Project Link\]](#)

2024

- Designed the complete electrical services layout for an eight-storied, four-unit residential building in compliance with the Bangladesh National Building Code (BNBC).
- **Tools Used:** AutoCAD 2024.

IoT-Based Health Monitoring System Using ESP32 Server [\[Project Link\]](#)

2024

- Developed an IoT-based system for real-time measurement of pulse rate and body temperature to assess basic health conditions.

Low-Noise Amplifier Design [\[Project Link\]](#)

2024

- Designed and simulated a low-noise amplifier circuit to meet specified gain and noise performance requirements.
- **Tools Used:** Cadence Virtuoso.

Smart Medicine Box [\[Project Link\]](#)

2023

- Developed an electronic system to remind patients to take prescribed medications at scheduled times.
- **Tools Used:** Breadboards, electronic ICs, jumper wires.

PID-Controlled Autonomous Water Surface Trash Collector and Water Quality Analyzer [\[Project Link\]](#)

2023

- Designed an autonomous system capable of detecting and collecting floating waste from water surfaces and analyzing water quality based on pH measurements.
- **Tools Used:** Arduino, PCB, Raspberry Pi.

Induction Motor Characteristics and Performance Analysis [\[Project Link\]](#)

2022

- Analyzed efficiency, torque characteristics, and various power losses of an induction motor through simulation and experimental evaluation.
- **Tools Used:** MATLAB.

Shadow Alarm Using Operational Amplifiers [\[Project Link\]](#)

2022

- Designed a motion-detection alarm circuit capable of detecting human movement from several meters without precise alignment and generating a high-intensity audible alert for restricted areas.
- **Tools Used:** PSPICE.

Technical Skills

Simulation Softwares: Sentaurus, Lumerical, ADS, Cadence, PSpice, Quartus, PSAF, Keil, Proteus, Vivado.

Programming Languages: C, C++, MATLAB, System Verilog.

Hardware Experience: Arduino, ESP32, FPGA board, Nexys A7.

CAD Software: AutoCAD 2024.

Document Preparation: Overleaf (LaTeX), OriginPro, Microsoft Word, PowerPoint, Excel.

Co-curricular Activities

- Organized college and university level **EEE DAY 2024 INTEGRATION BEE and EEE Olympiad** contest.

References

Dr. Nadim Chowdhury

Associate Professor, Department of EEE
Bangladesh University of Engineering and Technology
Email: nadim@eee.buet.ac.bd
Relationship: Undergraduate Thesis Supervisor

Dr. Hafiz Imtiaz

Professor, Department of EEE
Bangladesh University of Engineering and Technology
Email: hafizimtiaz@eee.buet.ac.bd
Relationship: Academic Advisor