Asiful Hoque

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Education

Present **Apr 2021**	**M.Sc. in EEE, Bangladesh University of Engineering and Technology (BUET)** • CGPA : **4.00/4.00** | Major : Electronics and Photonics
Dec 2019 **Jan 2016**	**B.Sc. in EEE, Shahjalal University of Science and Technology (SUST)** • CGPA : **3.84/4.00** Rank : **2nd** | Major : Electronics
Aug 2014	**Higher Secondary School Certificate, Chittagong College** • GPA : **5.00/5.00** | Major : Science
May 2012	**Secondary School Certificate, Chittagong Engineering University School and College** • GPA : **5.00/5.00** | Major : Science

Research Expertises

Nanophotonics and plasmonics, , Semiconductor Device Physics, Quantum transport, Widebandgap Electronics, Modeling and Simulation, GaN Technology.

Research Experiences

Present **Jun 2022**	**Nanoscale Device Modeling with III-V materials** |Dr. Md. Kawsar Alam • Designed and characterised group III-V compound material-based nanoscale dual capacitor transistors towards RF and IC applications. Important performance matrices, namely short channel effects, maximum cut off frequency, and gain bandwidth, are meticulously being investigated. • Investigating doped and charge plasma-based nanoscale transistors for RF and biosensing Applications with both 2D and 3D structures.
Present **Aug 2021**	**Density Functional Theory and Quantum Transport with NEGF** | Dr. Md. Kawsar Alam • Computationally analysed the electronic, optical, and mechanical properties of semi metalic $CaSnO_3$ compound, besides absorption of gas molecules on 2D graphene nanosheets through DFT and molecular dynamics. • Atomistic simulation of nanoscale devices through DFT coupled with NEGF, a quantum transport method to characterize device performance parameters.
Sep 2023 **Jan 2022**	**Plasmonic Absorber design with Carbon Nanotechnology** | Dr. Ahmed Zubair • Optimized a metal-dielectric-graphene-dielectric-metal structure to harness maximum absorbance from the graphene layer at the desired wavelength regime demonstrating polarization-dependent absorption, revealing possibilities for designing polarization-selective broadband absorbers by utilizing multiple stacks.
Jan 2021 **Mar 2019**	**Multichannel Junctionless Nanowire Transistors Design** | Md. Ishfak Tahmid • Developed TCAD-based model to characterise multichannel nanowire junctionless MOSFET. Device features with different structures are thoroughly investigated. Effect of High-k gate dielectric towards maximum I_{on}/I_{off} ratio, lower leakage, moderate subthreshold swing and RF analysis are observed.

Selected Publications (*Equal Contribution)

2023 M.S. Islam, **A. Hoque**, A. Zubair, "*Wavelength-Selective Polarization Sensitive Near-Perfect Absorber Based on Metal-Dielectric-Graphene-Dielectric-Metal Stack*",**IEEE Xplore**. 10.1109/SENNANO57767.2023.10352526 [Paper].

2021 M.R. Hossain, **A. Hoque**, M.I. Tahmid and M.M. Rahman "*Effect of high-k dielectric material on the characteristics of Single Gate and Double Gate Multi-Channel Junctionless Nanowire Transistors*", **IOP Journal of Physics**.10.1088/1742-6596/1921/1/012058. [Paper].

2020 **A. Hoque**, M.R. Hossain, M.I. Tahmid, "*A Comparative Study on Design and Characterization of Single Gate and Double Gate Multi-Channel Junctionless Nanowire Transistors*", **IEEE Xplore**. 10.1109/TENSYMP50017.2020.9230591 [Paper].

Manuscripts Under Preparation

2025 **A. Hoque**, M. K. Alam, "*Performance metrices analysis of Gate oxide engineered InGaN/GaN-Based Vertical Dual MOS Capacitor towards Linearity and Intermodular Voltage Dispersion*".(2025)

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Academic Projects

- Self-Consistent Modeling of DG-MOSFET by Developing Schrödinger-Poisson Coupled Solver.
- Electrical, optical, and mechanical properties of semimetalic $CaSnO_3$: A first Principle Study.
- Rigorous mathematical analysis of solar cell device physics in MATLAB.
- Hydrogen absorption on a monolayer 2D graphene sheet : molecular dynamics simulation.
- Design of a 4-bit Universal Shift Register with schematic and layout diagrams in Cadence.
- Capstone project on the implementation of a smart solar irrigation system.
- Capstone project on 3-phase transmission line fault detection with the GSM/GPS system.
- Near infrared graphene plasmonic absorber in Ansys Lumerical FDTD

Professional Experience

Dec 2023 – Jul 2022 | **Lecturer, Department of EEE, BUBT.**

- Courses Taught : Electrical Properties of Materials, Digital Signal Processing, Solid State and Devices, Digital Electronics, Numerical Methods for Electrical Engineers.
- Responsibilities : Besides conducting class, managed academic and other co-curricular activities, being a moderator of OBE-based curriculum, advised and supervised students for final year thesis.

Professional Training

Nov 2019 – Dec 2019 | **Industrial Training on Electrical Engineering and Instrumentation, from TICI, Narsinghdi.**

- Trained on : Industrial Instrumentation and Safety, Electrical machines and apparatus, bearings and turbines, PLC, DCS and their control mechanism, transmission line diagram drawing, including all necessary protection schemes for the system.

</> Technical Skills

- Nanoscale Device Modeling (Silvaco TCAD)
- COMSOL Multiphysics
- Density Functional Theory (Nanodcal & RESCU)
- Data Analysis (MATLAB & Python)
- Molecular Dynamic Simulation (Material Studio & RESCU)
- Nanophotonics and plasmonics (Ansys Lumerical)
- Non Equilibrium Green's Function(NEGF)
- Cadence Virtuoso

Honors and Awards

University Merit Scholarship for academic excellence at undergraduate study (2017-2019)
Board Scholarship for academic excellence at Higher Secondary School Exam (2014)

Synergistic and Leadership Activities

Dec 2023 – Aug 2022 | **Advisor**, IEEE Student Branch, BUBT Photonic Society.

- Organized Seminars and Distinguished Lectures of esteemed Researchers from Academia and Industry.
- Successfully conducted RoboMania 2023 Robotic Competition with the competitors who are highly fascinated and passionate in Robotics from many reputed universities.

Jan 2017 – Dec 2019 | **Contestant**, National Undergradute Math Olympiad

- Placed in the Sylhet region to compete at national level [2017-2018].
- Counseling students in competitive contests, Math Olympiad.

References

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