

MD. AL AMIN ISLAM UTSHOB

+8801611086006

alaminislamutshob.eee@gmail.com

359/D, Alauddin Manshion, Modhubagh, Mogbazar, Dhaka-1217, Bangladesh

<https://www.linkedin.com/in/md-al-amin-islam-utshob-7331ab3a7/>

<https://scholar.google.com/citations?user=ZtCwYJIAAAAJ&hl=en>



ABOUT ME

I am a highly motivated Electrical and Electronic Engineering (EEE) graduate with a strong commitment to academic excellence and scholarly research. I aspire to build a career in higher education, where I can contribute as both a dedicated teacher and an active researcher. My passion lies in delivering engaging, student-centered learning experiences while also pursuing innovative research in emerging technologies and applied engineering. I am particularly interested in mentoring students, fostering critical thinking, and guiding them toward academic and professional success. With strong analytical abilities, effective communication skills, and a disciplined work ethic, I am committed to advancing knowledge, contributing to curriculum development, and making a meaningful impact in academia through both teaching and research.

RESEARCH INTERESTS

Nanotechnology, Semiconductor Materials, Integrated Photonics, Optoelectronics, On-chip Optical Systems, Light-Matter Interaction, Plasmonics, Nanostructured Materials, Computational Electromagnetics, Numerical Modeling, Simulation-Driven Optimization, Nanoelectronic Devices, Heterostructures, Intelligent Systems, Biomedical Engineering, Bioelectrical Engineering, Theranostic Ultrasound, Photoacoustic Imaging, Hybrid Optical-Acoustic Systems, Machine Learning.

EDUCATION

Ahsanullah University of Science and Technology

2021 - 2026

- Department of Electrical & Electronic Engineering (BSc)
- **CGPA:** 3.823/4.00 (average of 3.94/4.00 in last 4 semesters) Rank : 04/141
- **Relevant Coursework:** Digital Logic Design, Power System, VLSI System Design and layout, VLSI Physical Design, Fabrication Technology, Solid-State Devices, Compound Semiconductor and Heterojunction Devices, Optical Fiber Communication, Optoelectronics, Power Electronics.
- **Undergraduate Thesis**

Thesis Title: "Zinc Telluride and BlueP/WS₂ Heterostructure Based High Performance SPR Biosensor for Early Diagnosis of Multistage Malaria"

- Designed a multilayer SPR biosensor (BK7+ZnTe+Ag+Fe₂O₃+BlueP/WS₂) for early malaria detection.
- Achieved ~444°/RIU sensitivity with high figure of merit and detection accuracy across multiple stages.
- Tools: COMSOL Multiphysics, MATLAB

Publications & Conference

- Utshob, et al., Biosensors and Bioelectronics: X (Q1, Elsevier), DOI: 10.1016/j.biosx.2025.100709
- Presented at Frontiers in Optics (FiO) 2025, Optica, DOI: 10.1364/FIO.2025.JD1A.4

Khulna Public College

2018 - 2020

- Higher Secondary School Certificate
- **GPA:** 5.00/5.00

Jhenidah Govt. Secondary School, Jhenidah

2016 - 2018

- Secondary School Certificate
- **GPA:** 5.00/5.00

EXPERIENCE

Adjunct Lecturer

June 2026 – Current

Department of EEE, Ahsanullah University of Science and Technology (AUST)

- Delivered undergraduate lectures on Electrical Circuits I, Electrical Circuits II, Electronics I, Digital Circuit Design.
- Prepared course materials, quizzes, assignments, and examinations.
- Assessed student performance and provided academic guidance.

Research Coordinator & Trainer

September 2025 – September 2026

PhotonIX Research | <https://photonixresearch.com>

- Mentoring and training 13 undergraduate students through structured teaching sessions.
- Delivering guidance on fundamental research concepts, methodologies, and applications.
- Assisted in research design, data collection, and analysis

Volunteer, AUST FYDP Spring 2024

EEE, AUST, Dhaka, Bangladesh

- Assisted with special events and programs.
- Used strong interpersonal communication skills to convey information to others.

RESEARCH & PUBLICATIONS

Journals

1. **M. A. A. I. Utshob**, M. B. Juwel, K. M. Ishtiak, A. Rahman, M.M.A. Rahman, S. A. Imam, S. M. I. Huq and Q. D. M. Khosru, "Artificial intelligence enabled performance evaluation of an enhanced SPR biosensor for malaria diagnosis", published in *Scientific Reports [Impact Factor: 3.9, Q1, Scopus and WoS indexed]*. [\[Link\]](#) | 2026
2. **M. A. A. I. Utshob**, M. B. Juwel, M.M.A. Rahman, S. A. Imam, and K. M. Ishtiak, "Integration of Computational Optics and Machine Learning for Optimized SPR-Based Carcinoembryonic Antigen Detection", published in *Biomedical Optics Express [Impact Factor: 3.2, Q1, Scopus and WoS indexed]*. [\[Link\]](#) | 2026
3. **M. A. A. I. Utshob**, M. B. Juwel, R. Sabiha, A. Rahman, S. A. Imam, and K. M. Ishtiak, "Design of a highly sensitive SPR biosensor for rapid malaria detection based on zinc telluride and blue phosphorus/tungsten disulfide material", published in *Biosensors and Bioelectronics: X [Impact Factor: 8.4, Q1, Scopus and WoS indexed]*. [\[Link\]](#) | 2025
4. **M. A. A. I. Utshob**, M. B. Juwel, N. Al Mahmud, A. Rayhan, S. A. Imam, A. Rahman, K. M. Ishtiak, and B. Karki, "Advancing Chemical Sensing Using Hybrid SPR: A Numerical Study of Key Organic Compounds", accepted in *Sensing and Imaging [Impact Factor: 2.0, Q3, Scopus and WoS indexed]*. [\[Link\]](#) | 2026
5. **M. A. A. I. Utshob**, M. B. Juwel, N. Al Mahmud, S. M. I. Huq, and K. M. Ishtiak, "Hybrid machine learning driven optimization of multilayer SPR sensor for high sensitivity milk fat detection", *published in PLoS One [Impact Factor: 2.8, Q1, Scopus and WoS indexed]*. [\[Link\]](#) | 2026
6. M. B. Juwel, **M. A. A. I. Utshob**, N. Al Mahmud, A. Rahman, S. A. Imam, and K. M. Ishtiak, "Design and optimization of a hybrid SPR biosensor for highly sensitive detection of carcinoembryonic antigen", published in *Next Materials [Impact Factor: 1.9, Q1, Scopus and WoS indexed]*. [\[Link\]](#) | 2025
7. M. B. Juwel, **M. A. A. I. Utshob**, A. Rayhan, S. A. Imam, A. Rahman, and K. M. Ishtiak, "Niobium pentoxide and black phosphorus based multilayer surface plasmon resonance biosensor for the detection of ultra-sensitive mycobacterium tuberculosis", published in *Journal of Computational Electronics [Impact Factor: 2.5, Q3, Scopus and WoS indexed]*. [\[Link\]](#) | 2026
8. M. B. Juwel, **M. A. A. I. Utshob**, M. T. Bhuiyan, M. M. A. Rahman, S. A. Imam, and K. M. Ishtiak, "ML assisted accuracy prediction of a silicon carbide based SPR biosensor for acetone concentration measurement", accepted in *Journal of the American Ceramic Society [Impact Factor: 3.8, Q2, Scopus and WoS indexed]*. [\[Link\]](#) | 2026

9. T. F. Toha, R. Karism, N. Montasir, T. M. Momo, M. B. Juwel, **M. A. A. I. Utshob**, S. A. Imam, and K. M. Ishtiak, "Graphene assisted multilayer SPR biosensor with superior specificity for breast cancer cell detection", published in **Results in Engineering [Impact Factor: 7.9, Q1, Scopus and WoS indexed]**. [\[Link\]](#) | 2026
10. R. Karism, N. Montasir, T. F. Toha, T. M. Momo, **M. A. A. I. Utshob**, M. B. Juwel, and K. M. Ishtiak, "Biofunctional Interface Integrated Multilayer SPR Biosensor for Precise Detection of Basal Cell Carcinoma", published in **Electron [Impact Factor: 2.2, Q1, Scopus and WoS indexed]**. [\[Link\]](#) | 2026

Conferences

1. **M. A. A. I. Utshob**, M. B. Juwel, R. Sabiha, and K. M. Ishtiak, "Optimized Surface Plasmon Resonance Biosensor utilizing 2D Material for Enhanced Malaria Detection", **Frontiers in Optics + Laser Science 2025 (FIO, LS)**, 26 - 30 October 2025, Denver, Colorado, USA. [\[Link\]](#) | 2025
2. **M. A. A. I. Utshob**, M. B. Juwel, and K. M. Ishtiak, "Molybdenum Diselenide Functionalized SPR Biosensor for Ultra Sensitivite Carcinoembryonic Antigen Detection", **2025 7th International Conference on Electrical Information and Communication Technology (EICT)**, KUET, Khulna, Bangladesh. [\[Link\]](#) | 2025
3. **M. A. A. I. Utshob**, M. B. Juwel, and K. M. Ishtiak, "Quantum Material BP Based Plasmonic Optical Sensor for Label Free Colorectal Cancer", Quantum 2.0 Conference 2026, 15 - 18 June 2026, Scottish Event Campus, Glasgow, UK. [\[Link\]](#) | 2026
4. M. B. Juwel, **M. A. A. I. Utshob**, and K. M. Ishtiak, "Hybrid Multilayer SPR Biosensor for Cancer Biomarker (CEA) Detection", **Optica Biophotonics Congress**, 26 - 29 April 2026, The Westin Fort Lauderdale Beach Resort, Fort Lauderdale, Florida, USA. [\[Link\]](#) | 2026
5. **M. A. A. I. Utshob**, M. B. Juwel, K. M. Ishtiak, and Q. D. M. Khosru, "Optimization of a Multilayer SPR Biosensor for Improved Tuberculosis Sensing Performance", **IEEE-NANO 2026**, 5 - 8 July 2026, Nanjing, China | **PID-110. (Accepted)**
6. R. Karim, **M. A. A. I. Utshob**, T.F. Toha, N. Montasir, M. B. Juwel, and K. M. Ishtiak, "High Performance Multilayer SPR Biosensor for Label-Free Detection of MCF-7 Breast Cancer Cells", **Optica ImageSense Congress**, 12 - 17 July 2026, The Maastricht Exhibition & Conference Centre, Maastricht, NETHERLANDS | **PID-JTu4A.20. (Accepted)**
7. M. T. Bhuiyan, **M. A. A. I. Utshob**, M. B. Juwel, and K. M. Ishtiak, "Computational optimization of a multilayer SPR biosensor for highly sensitive detection of blood cancer", **Optica ImageSense Congress**, 12 - 17 July 2026, The Maastricht Exhibition & Conference Centre, Maastricht, NETHERLANDS | **PID-JTu4A.22. (Accepted)**

ACADEMIC PROJECTS

Automatic LPG gas leakage detection with auto cut-off gas regulator with SMS and call alert

- The project aims to develop an automatic gas leakage detection system using an Arduino microcontroller and an MQ2 Gas Sensor. Upon detecting a leak, the system triggers a GSM SIM800L module to send SMS and call alerts to the user while simultaneously using a servo motor to shut off the gas supply and an exhaust fan to clear the area.

Automated Transformer Overload Protection System

- This project aims to safeguard transformers from damage by automatically detecting and responding to overload conditions. It utilizes an LM324N Op-Amp as a sensing unit to monitor load current and triggers an automatic disconnect circuit to shed excess load, thereby enhancing the transformer's reliability and lifespan.

Voltage-controlled oscillator based analog-to-digital converter in 45nm CMOS for biomedical applications

- This project focuses on designing a low-power VCO-based Analog-to-Digital Converter (ADC) for biomedical implants and portable sensors using 45nm CMOS technology. By using a current-starved VCO and a D-flip flop reset counter, the circuit achieves high energy efficiency, consuming only 191.6 uW while reducing chip area.

Analysis and Design of a Single-Phase Full-Wave Controlled Rectifier

- This project involves the design of a Single-Phase Full-Wave Controlled Rectifier using Thyristors (SCRs) to convert AC power into a controllable DC output. By adjusting the firing angle via UJT and Optocouplers, the system provides precise DC power regulation suitable for motor drives and battery charging applications.

Design and Implementation of an Air Conditioner Using Finite State Machine (FSM)

- This project focuses on the design and implementation of a digital air conditioner controller using a Finite State Machine (FSM) and an ASIC design flow. It utilizes tools like Cadence Genus for synthesis and ModelSim for functional verification to create a layout-ready design that regulates state transitions based on power and temperature inputs.

Numerical Simulation and Analysis of Design of a Distributed Bragg Reflector (DBR)

- This project focuses on the design and simulation of a Distributed Bragg Reflector using the Transfer Matrix Method. It investigates wavelength-selective reflection characteristics of multilayer thin films and optimizes layer thickness and material properties ($\text{TiO}_2/\text{SiO}_2$) to enhance reflectivity and overall optical performance for photonic applications.

ACHIEVEMENTS AND AWARDS

Merit Position Scholarship - (Full Tuition Fee Waiver)

- Received a merit-based tuition fee waiver from the 2nd to 8th semester in recognition of consistent academic excellence.

Achieved Dean's List honors for high academic excellence

- Ranked **4th** in my batch based on overall academic performance.

Champion, Final Year Design Project (FYDP) | Poster Exhibition and Competition Fall 2024

- Achieved 1st Place (Champion) among 53 groups in the Final Year Design Project (FYDP) Poster Exhibition and Competition, Fall 2024.

TECHNICAL SKILLS

Programming Language: Matlab, C++

Simulation Tools: Proteus, AutoCAD, COMSOL Multiphysics, Quartus Prime, Origin Pro, Arduino IDE, Cadence (Virtuoso, Genus, Innovus).

Microsoft Office: MS Word, MS Excel, MS PowerPoint

Others: Photoshop, Illustrator, Canva

REFERENCES

Dr. Khandakar Mohammad Ishtiaq

- Dr. Khandakar Mohammad Ishtiaq is an Associate Professor at Ahsanullah University of Science and Technology, Dhaka, Bangladesh
- **Email:** ishtiaq.eee@aust.edu
- **Phone:** (+880) 1819427734
- https://aust.edu/eee/faculty_member/dr_khandakar_mohammad_ishtiaq

Dr. Ahmed Al Mansur

- Dr. Ahmed Al Mansur is a Professor and Chairman at Bangladesh University of Business and Technology (BUBT), Dhaka, Bangladesh
- **Email:** mansur.eee@bubt.edu.bd
- **Phone:** (+880) 1715020314
- <https://eee.bubt.edu.bd/faculty-members/prof-dr-ahmed-al-mansur>