

# MAHNAZ ISLAM

Ph.D. Candidate  
Electrical Engineering, Stanford University

720 Serra St., Stanford, CA 94305, USA  
T: +16509247315 E: [mzislam@stanford.edu](mailto:mzislam@stanford.edu)

## EDUCATION

- **Ph.D. in Electrical Engineering** Fall 2019-Present  
Stanford University
- **M.Sc. in Electrical Engineering** June 2021  
Stanford University CGPA-4.02/4.00
- **M.Sc. in Electrical and Electronic Engineering** April 2019  
Bangladesh University of Engineering and Technology (BUET) CGPA-4.00/4.00
- **B.Sc. in Electrical and Electronic Engineering** February 2017  
Bangladesh University of Engineering and Technology (BUET) CGPA-3.98/4.00 Merit Position-2/194

## PROFESSIONAL EXPERIENCE

- *Assistant Professor*, Department of EEE, BUET August 2019-Present (on study leave)
- *Lecturer*, Department of EEE, BUET 17 May 2017- 23 August 2019  
Course Instructed: (Theory) Introduction to Electrical Engineering; (Labs) Communication Laboratory, Power Electronics, Microprocessor and Interfacing, Measurement and Instrumentation, Electronic Devices and Circuits.

## RESEARCH EXPERIENCE

- *Pop Lab, Stanford University | Ph.D. Candidate* September 2019- Present  
*Advisor:* Eric Pop, Professor, EE, Stanford University  
Fabricated switching devices utilizing the Insulator-Metal-Transition (IMT) in oxides such as VO<sub>2</sub>, NbO<sub>2</sub>, LaCoO<sub>3</sub>; Measured static and dynamic/spiking electrical behaviour of devices; Imaged local heating of devices using in situ scanning probe microscopy (SThM) and thermoreflectance techniques; Characterized emission spectra of NbO<sub>2</sub> switching device using FTIR and Raman spectroscopy techniques.
- *Nanoscale Science and Technology Group, BUET | M.Sc. Student* March 2017-April 2019  
*Advisor:* Prof. Md. Kawsar Alam, EEE, BUET  
*M.Sc. Thesis:* "Electric Field Induced Formation and Characterization of Nanoscroll from Water-Submerged Carbon Nanoscrolls"  
Study of graphene nanoribbon in water under an external electric field to form carbon nanoscrolls; Thermal study of carbon nanotube-based nanomotor in water to study its speed-temperature regulation; First-principles calculation of optical properties of doped methylammonium lead halide perovskites using DFT.
- *Nanoscale Science and Technology Group, BUET | B.Sc. Student* July 2015-Feb 2017  
*Advisor:* Prof. Md. Kawsar Alam, EEE, BUET  
*B.Sc. Thesis:* "Physics-based Modeling and Performance Analysis of Dual Junction Perovskite/Silicon Tandem Solar Cells"  
Developed an optoelectronic model for perovskite solar cells using transfer matrix formalism; Developed a physics-based model of bulk heterojunction organic solar cells that incorporates the spatial distribution of generation rate; Reported a Gaussian shaped optimum generation rate profile in the active layer for the device; Modeled an experimentally reported two-terminal perovskite/Si tandem cell and optimized the device by performing a computational analysis.

## PUBLICATIONS

1. S. M. Bohaichuk, S. Kumar, **M. Islam**, M. M. Rojo, R. S. Williams, G. Pitner, J. Jeong, M. G. Samant, S. S. P. Parkin, and E. Pop, "Reconfigurable Dynamics and Electro-Thermal Bifurcation of VO<sub>2</sub> Mott Oscillators", *Physical Review Applied*, 2021 (under review).
2. S. Wahid, A. Daus, A. I. Khan, V. Chen, K. M. Neilson, **M. Islam**, M. E. Chen, and E. Pop, "Lateral Electrical Transport and Field-Effect Characteristics of Sputtered P-Type Chalcogenide Thin Films", *Applied Physics Letters* 119, 2021 (just accepted).
3. **M. Islam**, M. M. Rahman, M. M. Chowdhury, and M. K. Alam, "Graphene Nanoscrolls via Electric Field-Induced Transformation of Water-Submerged Graphene Nanoribbons for Energy Storage, Nanofluidic, and Nanoelectronic Applications", *ACS Applied Nano Materials*, Vol. 02, Issue: 09, pp. 5857 - 5870, 2019.
4. S. R. Bakaul, **M. Islam**, and M. K. Alam, "Ferroic materials and devices for flexible memory," In "Handbook of Flexible and Stretchable Electronics", Edited by M. M. Hussain and N. El-Atab, CRC Press, pp. 149-164, 2019.
5. N. M. Rahman, M. Adnaan, D. Adhikary, **M. Islam**, and M. K. Alam, "First-principles calculation of the optoelectronic properties of doped methylammonium lead halide perovskites: A DFT-based study", *Computational Materials Science*, Vol. 150, Issue: July, pp. 439-447, 2018.
6. S. Wahid, **M. Islam**, M. S. S. Rahman, and M. K. Alam, "Transfer Matrix Formalism Based Modeling and Performance Evaluation of Perovskite Solar Cells", *IEEE Transactions on Electron Devices*, Vol. 64, Issue: 12, pp. 5034-5041, 2017.

7. **M. Islam**, S. Wahid, M.M. Chowdhury, and M. K. Alam, “Effect of spatial distribution of generation rate on bulk heterojunction organic solar cell performance: A novel semi-analytical approach”, *Organic Electronics*, Vol. 46, Issue: July, pp. 226-241, 2017.
8. **M. Islam**, S. Wahid, and M. K. Alam, “Physics-Based Modeling and Performance Analysis of Dual Junction Perovskite/Silicon Tandem Solar Cells,” *physica status solidi (a)*, Vol. 214, Issue: 2, pp. 1600306-1 - 1600306-13, 2017.
9. S. Wahid, **M. Islam**, and M. K. Alam, “Modeling and optimization of two-terminal Perovskite/Si tandem solar cells: A theoretical study,” *In Proc. of the IEEE International Women in Engineering (WIE) Conference on Electrical and Computer Engineering 2015 (WIECON-ECE)*, pp. 235-238, Dhaka, Bangladesh, December 2015.

#### SKILLS

- *Fabrication*: Optical Lithography, E-beam Evaporation, Dry & Wet Etching
- *Characterization*: Atomic Force Microscopy, X-ray Photoelectron Spectroscopy, X-ray Absorption Spectroscopy, Electrical Probe Station, Transmission Line Pulse Testing, Fourier Transform Infra-Red Spectroscopy, Raman Spectroscopy
- *Programming Languages*: C, C++, 8086 Assembly Language, Verilog
- *Simulation and Design Tools*: MATLAB, PSpice, COMSOL Multiphysics, GROMACS

#### RELEVANT COURSEWORK

- *Graduate Coursework (Stanford U.)*: EE 212 (Integrated Circuit Fabrication Processes) | EE 216 (Principles and Models of Semiconductor Devices) | EE 218 (Power Semiconductor Devices and Technology) | EE 312 (Integrated Circuit Fabrication Laboratory) | EE 311 (Advanced Integrated Circuits Technology) | EE 323 (Energy in Electronics) | EE 309A (Semiconductor Memory Devices and Circuit Design) | EE 309B (Emerging Non-Volatile Memory Devices and Circuit Design) | MATSCI 312 (New Methods in Thin Film Synthesis)
- *Graduate and Undergraduate Coursework (BUET)*: Quantum Phenomena in Nanostructures | Applied EM theory | Laser Theory | Electrical Properties of Materials | Solid State Devices | Engineering Electromagnetics | Processing and Fabrication Technology | Compound Semiconductor and Hetero-Junction Devices | Optoelectronics

#### AWARDS AND HONORS

- Thomas and Sarah Kailath Fellow, Stanford Graduate Fellowship in Science and Engineering, 2019-2022
- 2<sup>nd</sup> position (among 194 students) with Honors in B.Sc. (Electrical & Electronic Engineering) Examination
- University Merit Scholarship, BUET (results of undergraduate study in each term), 2012-2017
- Dean’s List Scholarship, BUET (academic excellence at undergraduate level in each academic year), 2012-2017

#### LEADERSHIP AND OUTREACH

- *Volunteer*, Stanford Women in Electrical Engineering Fall 2021 - present
- *Secretary*, IEEE Electron Devices and Solid-State Circuits Society Bangladesh Chapter 2018- Aug 2019
- *Chapter Advisor*, IEEE Electron Devices BUET Student Branch Chapter 2017
- *Student Project Mentor*, instructed student projects under Microprocessor and Interfacing, Communication, and Power Electronics Laboratories. 2017-2019
- *Lab Coordinator*, Nanoelectronic Devices and Materials Research Laboratory, BUET 2017-2019
- *Social Media Coordinator*, IEEE Women in Engineering BUET Student Branch Affinity Group 2016
- *Member of the Organizing Committee*
  - 10<sup>th</sup> International Conference on Electrical and Computer Engineering (ICECE) 2018, Bangladesh
  - 2<sup>nd</sup> IEEE International Conference on Telecommunications and Photonics (ICTP) 2017, Bangladesh
  - 5<sup>th</sup> IEEE Region 10 (Asia Pacific) Humanitarian Technology Conference (R10HTC) 2017, Bangladesh

#### REFERENCE

- **Prof. Eric Pop**, Department of Electrical Engineering, Stanford University, Allen Bldg. Annex, Room 335, Stanford, CA, USA. E-mail: [epop@stanford.edu](mailto:epop@stanford.edu)