Md Sahabul Hossain

Graduate Research Assistant

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Education

University of New Mexico, USA **August 2021 – May 2025 (Expected)**

Ph.D., Department of Electrical and Computer Engineering

- **Laboratory**: Performance and Resource Optimization Lab (PROTON Lab)
- **Research Interest**: Wireless Communication and Networks, Network Economics, Artificial Intelligence, Cybersecurity

University of New Mexico, USA **August 2021 – December 2023 (Expected)**

M.Sc, Computer Engineering

- **Laboratory**: Performance and Resource Optimization Lab (PROTON Lab)
- **Research Interest**: Alternative Positioning, Navigation and Timing, Wireless Communication and Networks, Network Economics, Artificial Intelligence
- **Thesis**: Location Aware Task Offloading Framework for Edge Computing Empowered by Reconfigurable Intelligent Surfaces

Islamic University of Technology, Bangladesh **December 2011 – November 2015**

B.Sc, Electrical and Electronic Engineering

- **Research Interest**: Waveguide and Optical Filter Designing, Application of Finite Difference Time Domain Method, Artificial Intelligence

Research Experience

Graduate Research Collaborator **February 2022 – Present**

EVs@scale PKI *University of New Mexico*

A joint Project by the DoE, National Renewable Energy Laboratory and Sandia National Laboratories

Employed by Sandia National Laboratories as a graduate research collaborator from the UNM

- Assessments and evaluations of Plug & Charge security for ISO 15118 capable EV charging infrastructure.
- Vulnerability and security posture identification of the implemented Plug & Charge (PnC) system.
- Public Key Infrastructure (PKI) based security for electric vehicle charging system.

Project details:
As the sources of non-renewable energy are being depleted, the importance of investing on renewable energy related innovation is increasing exponentially. In the transportation sector, the usage Electric Vehicles is enabling the world to transform from a non-renewable, fossil fuel dependent infrastructure to a green, renewable energy dependent one. All the technologically advanced countries around the world are diverting significant research effort to Electric Vehicles and their charging infrastructure. In the US, the Biden-Harris Administration has projected EVs to make up 50% of new car sales by 2030 and to support this rapidly growing EV market, it has announced billions of dollars of investment on clean transportation, electric vehicles and EV batteries. This project is a direct result of this and crucial in providing a sustainable, eco-friendly future for the Americans.

Research Assistant **August 2021 – Present**

Performance and Resource Optimization Lab (PROTON Lab) *University of New Mexico*

- Alternative Positioning, Navigation and Timing
- Wireless Communication and Networks
- Network Economics
- Artificial Intelligence

Teaching Experience

Lecturer **October 2016 – July 2021**

Department of Electrical and Electronic Engineering *Bangladesh University of Business and Technology*

Courses taught:

- Structured Programming Language (Theory and Lab)
- Numerical Analysis for Engineers (Theory)
- Microprocessor and Interfacing (Theory and Lab)
- Introduction to MATLAB (Lab)
- Mobile Cellular Communication (Theory)
- Digital Signal Processing (Theory and Lab)

Responsibilities:

- Prepared and conducted nine 1-hour theoretical lectures (40 – 60 students) and three 3-hour laboratory sessions (30 – 40 students) per week.

Intake In-charge **2018 – 2021**

Department of Electrical and Electronic Engineering *Bangladesh University of Business and Technology*

Responsibilities:

- Helped three intakes of students with course registrations and acted as their academic advisor.

Member of Routine management Committee **2019 – 2021**

Department of Electrical and Electronic Engineering *Bangladesh University of Business and Technology*

Responsibilities:

- Together with other members of the committee made academic routines for the department of Electrical and Electronic Engineering.

Member of Question Moderation Committee **2019 – 2020**

Department of Electrical and Electronic Engineering *Bangladesh University of Business and Technology*

Responsibilities:

- Moderated mid-term and final examination question papers of electronics major courses.

Peer Reviewing Experience

Technical Program Committee (TPC) Member

IEEE Conferences

- IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids 2023, Glasgow, Scotland.

Peer Reviewer (Verified by Web of Science)

IEEE Conferences

- 3 Papers - IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids 2023, Glasgow, Scotland.
- 2 Posters - IEEE Symposium on Computers and Communications 2022, Rhodes Island, Greece.
- 2 Demos - IEEE Symposium on Computers and Communications 2022, Rhodes Island, Greece.
- 1 Paper - IEEE International Symposium on World of Wireless Mobile and Multimedia Networks 2022, Belfast, United Kingdom.

Technical Skills

Languages: Python, MATLAB and Simulink, C, C++, Java, JavaScript, PHP, SQL, VHDL

Software/Tools: Deep Learning with Keras, Tensorflow and Scikit-learn, Reinforcement Learning with Stable Baselines, Linux OS, Network Simulation in NS3, Xilinx Vivado, Minimega, Phenix

Other skills: Research and open data aggregation, Data cleaning and processing, Excellent visualizations, Collaborative project management, Exceptional knowledge on ISO 15118-2, ISO 15118-20, OCPP and Public Key Infrastructure

Publications — Google Scholar

Journal Publications

- **M.S. Hossain**, N. Irtija, M. Diamanti, F. Sangoleye, E.E. Tsiropoulou, and S. Papavassiliou, "Reconfigurable intelligent surfaces-enabled edge computing: A location-aware task offloading framework", ITU Journal on Future and Evolving Technologies, 2022. DOI: 10.52953/FLTJ9889
- M. Hasan, F. Maoya, **M.S. Hossain**, R. Ahmed, M. Hossain, K. Ali, and S. Islam, "Plasmonic corrugated waveguide coupled to a rectangular nano-resonator as an optical filter", OSA Continuum, 2020. DOI: 10.1364/OSAC.403762

Conference publications

- M. S. Siraj, **M. S. Hossain**, R. Brown, E. E. Tsiropoulou, and S. Papavassiliou, "Incentives to learn: A location-based federated learning model," in 2022 Global Information Infrastructure and Networking Symposium (GIIS), pp. 40–45, 2022. DOI: 10.1109/GIIS56506.2022.9937034
- **M.S. Hossain**, F. Sangoleye, O. Poudyal, and E.E. Tsiropoulou, "Network Economics-enabled Edge Computing in UAV-assisted Public Safety Systems", 18th Annual International Conference on Distributed Computing in Sensor Systems, DCOSS 2022. DOI: 10.1109/DCOSS54816.2022.00067
- F. Sangoleye, **M.S. Hossain**, E.E. Tsiropoulou, and J. Plusquellic, "Network Economics-based Crowdsourcing in UAV-assisted Smart Cities Environments", 18th Annual International Conference on Distributed Computing in Sensor Systems, DCOSS 2022. DOI: 10.1109/DCOSS54816.2022.00030
- **M.S. Hossain**, N. Irtija, E.E. Tsiropoulou, J. Plusquellic, and S. Papavassiliou, "Reconfigurable Intelligent Surfaces enabling Positioning, Navigation, and Timing Services", IEEE International Conference on Communications, 2022. DOI: 10.1109/ICC45855.2022.9838473

Honors and Awards

OIC granted scholarship for 4 years of undergraduate study **2011 – 2015**
Islamic University of Technology *Gazipur, Bangladesh*

Government Scholarship in HSC examination from Education Board **2011 – 2015**
Education Board Bangladesh *Bangladesh*

Government Scholarship in SSC examination from Education Board **2010 – 2011**
Education Board Bangladesh *Bangladesh*

Achievements

Champion **2011**
Divisional Stage, 4th National Chemistry Olympiad *Bangladesh*

Champion, Higher secondary category **2011**
Divisional Stage, 9th National Math Olympiad *Bangladesh*

Champion, Secondary category **2009**
Divisional Stage, 7th National Math Olympiad *Bangladesh*

Champion, Junior category **2007**
Divisional Stage, 5th National Math Olympiad *Bangladesh*