Aisha B. Rahman

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Highlights

• 3 years of experience in simulation and data analysis using Python for research work on building distributed decision-making policies for optimal resource allocation in heterogeneous networks including Beyond 5G networks, *Sustainable* computing systems, etc., with a strong and consistent record of publications.
• Experience in cutting-edge wireless technology components including Integrated Access and Backhaul Networks, Reconfigurable Intelligent Surfaces, Simultaneous Wireless Information and Power Transfer, etc., with over 1 year of experience using OMNeT++ network simulator for emulation-based experiments.
• Research assistant in U. S. Department of Energy-funded project for modelling and building a resilient wireless network to replace traditional wired concentrated solar power systems.
• Hands-on experience in building a Machine Learning (ML) pipeline. Directly contributed to the development of ML pipeline for malware detection in electric vehicles' charging networks' wireless payload exchange. Different ML classifiers for malware detection were explored following the collection of large datasets and feature engineering.
• 1+ years experience using High-Performance Computing (HPC) systems for simulation-based experiments.

Education

• Arizona State University, USA **May 2026 (Expected)**
Ph.D., Department of Electrical, Computer and Energy Engineering

Research Interest: Applications of optimization tools and learning techniques including supervised, unsupervised, and reinforcement learning for determination of optimal resource allocation in heterogeneous networks including wireless communication networks, *Sustainable* computing environments, and distributed energy resource (DER) systems.

• University of New Mexico, USA **December 2023**
M.Sc, Computer Engineering (with Distinction) *GPA 4.23/ 4.00*

• University of Chittagong, Bangladesh **February 2021**
M.Sc, Electrical and Electronic Engineering *GPA 3.64/ 4.00*

• University of Chittagong, Bangladesh **December 2018**
B.Sc., Department of Electrical and Electronic Engineering *GPA 3.68/ 4.00*

Work Experience

Graduate Research Assistant **Jan 2022 – Present**
Performance and Resource Optimization Lab (PROTON Lab) *Arizona State University*

***HELIOCOMM**: A Resilient Wireless Heliostats Communication System;* *Funded by U. S. Department of Energy*

- Modeling a resilient wireless communication system for heliostat fields to replace conventional wired networks.
- Exploring interference mitigation techniques due to high interference in heliostat fields.
- Simulation and emulation using Python coding and wireless emulators including OMNET++ and/or NS3.
- Testing of the developed system in large scale for available direct normal irradiation and heliostats mirror orientation dataset in high performance computing (HPC) environments.

Technical Skills: Languages– Python and C++, Tools– Reinforcement learning, OMNET++, HPC.

***Goaltender**: Cloud-based Defense and Response Tools for DER Ecosystem;* *Funded by U. S. Department of Energy*

- Modeling a robust and efficient malware detection solution for electric vehicles communication networks.
- Collection of large, labeled dataset of OCPP 2.0.1 JSON payloads between EV Charge Point (CP) and Charging Station Management System (CSMS).
- Parsing and preprocessing of the collected dataset followed by extraction of informative features.
- Investigating dimensionality reduction techniques to reduce the risk of overfitting and enhance classification model efficiency.
- Exploring and evaluating multiple machine learning models for malware detection, considering supervised learning methods.

Technical Skills: Languages– Python, SQL, Tools/Framework– Supervised and unsupervised machine learning, Scikit-Learn, TensorFlow, Docker.

Teaching Assistant **Jan. 2022 – May 2022**

Department of Electrical and Computer Engineering *University of New Mexico*

- ECE-440 Introduction to Computer Networks

Research Assistant **May 2019 – Feb. 2021**

Wireless Emerging Technology Lab (WET LAB) *University of Chittagong*

- Conducting research on cutting-edge wireless technologies including cooperative communication, simultaneous wireless information and power transmission, and RF energy harvesting.

Selected Publications (Google Scholar) and Presentations

Technical Papers

- **A. B. Rahman**, A. M. Panteleaki, I. Anagnostopoulos, E. E. Tsiropoulou, "Cloudonomics: Cloud Computing Economics Incentivizing Sustainable Cloud Usage", in IEEE Transactions on Green Communication and Networks (Under Review).
- M. Diamanti, **A. B. Rahman**, P. Charatsaris, E. E. Tsiropoulou, S. Papavassiliou, "Resource Allocation as a Market: A Case Study on Multi-Server Multi-Model Federated Learning", in 20th Wireless On-demand Network systems and Services Conference 2025. (Accepted)
- **A. B. Rahman**, M. S. Siraj, E. E. Tsiropoulou, "HELIO-NET: Heliostats Empowered with Wireless Integrated Access and Backhaul Technology", IEEE WF-IoT 2024 (To appear).
- **A. B. Rahman**, Y. S. Chen, E. E. Tsiropoulou, S. Papavassiliou, "SynergyWave: Bandwidth Splitting and Power Control in Integrated Access and Backhaul Networks", IEEE ICC 2024 (To appear).
- **A. B. Rahman**, M. F. Kader, "A new energy harvesting scheme for multi-relay cooperative networks", Digital Signal Processing, Volume 133, March 2023. doi: 10.1016/j.dsp.2022.103846
- **A. B. Rahman**, J. Patrizi, P. Charatsaris, E. E. Tsiropoulou, S. Papavassiliou, "Bioinspired Dynamic Spectrum Management in 3D Networks", 2023 19th International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT), Pafos, Cyprus, 2023, pp. 166-170, doi: 10.1109/DCOSS-IoT58021.2023.00038.
- **A. B. Rahman**, P. Charatsaris, E. E. Tsiropoulou, S. Papavassiliou, "Information-Centric Networking Cache Memory Allocation: A Network Economics Approach", GLOBECOM 2023 - 2023 IEEE Global Communications Conference, Kuala Lumpur, Malaysia, 2023, pp. 1259-1264, doi: 10.1109/GLOBECOM54140.2023.10437315.

Technical Reports

- E. E. Tsiropoulou, **A. B. Rahman**, and M. S. Siraj, "HELIOCOMM: Wireless Controls State-of-the-Art Report", 2024, Golden, CO: National Renewable Energy Laboratory. NREL/SR-5K00-88431.

Magazines

- E. E. Tsiropoulou, **A. B. Rahman**, M. S. Siraj, "HELIOCOMM: A Wireless Revolution in Concentrated Solar Power Systems," in IT Professional, vol. 26, no. 3, pp. 73-79, May-June 2024, doi: 10.1109/MITP.2024.3389502

Oral Presentations

- Conference presentation for accepted papers at 2022 Global Communications Conference and 2024 International Conference on Communications.
- Poster presentation on "Information-centric Networking Cache Memory Allocation: A Network Economics Approach" at The LoboBITES Research Poster Presentation 2023, Shared Knowledge Conference, University of New Mexico, Albuquerque, New Mexico, USA.
- Presentation on progress and updates during biweekly and quarterly meetings with Sandia National Laboratories and National Renewable Energy Laboratory for the project HELIOCOMM: A Resilient Wireless Heliostats Communication System, funded by the U. S. Department of Energy.
- Presentation on progress and updates during biweekly meetings with Sandia National Laboratories and Distributed Energy Resources Security Corp for the project Goaltender: Cloud-Based Defense and Response Tools for DER Ecosystem, funded by the U. S. Department of Energy.

Volunteering and Leadership Experience

Chair **Aug. 2022 – Dec. 2024**

IEEE Women in Engineering Affinity Group Albuquerque Section

- Organizing and conducting monthly public talks, workshops, and other volunteering activities for promoting women engineers and scientists.

Chapter Vice-chair **Dec. 2023 – Dec. 2024**

IEEE Albuquerque Section Communications Society and Computer Society Joint Chapter

- Organizing and conducting monthly public talks, workshops, and webinars.

Technical Program Committee (TPC) Member and Peer Reviewer

IEEE Conferences and Journals including IEEE WCNC 2025, IEEE CIoT 2024, IEEE SmartGridComm 2023.

Honors and Awards

IEEE Albuquerque Section Outstanding Graduate Student Award 2024 **2024**
IEEE Albuquerque Section *Albuquerque, NM, USA*

IEEE Albuquerque Section Service Award 2023 **2023**
IEEE Albuquerque Section *Albuquerque, NM, USA*

2022 Women in Technology Scholarship **2022**
Cadence Design Systems *California, USA*