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 complex heterogeneous networks through constrained optimization problems and/or Reinforcement Learning.
• 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. 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.
• Demonstrated strong teamwork and collaborative skills by working closely with cross-functional teams, including scientists from national labs on two U. S. Department of Energy-funded projects.

Education

• University of New Mexico, USA **Jan. 2022 – May 2026 (Expected)**
Ph.D., Department of Electrical and Computer 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, federated learning systems, and distributed energy resource (DER) systems.

Relevant Coursework: ECE 537: Foundations of Computing, ECE 517: Machine Learning, ECE 595: Reinforcement Learning.

• University of New Mexico, USA **Jan. 2022 – Dec. 2023**
M.Sc, Computer Engineering (with Distinction) *GPA 4.23/ 4.00*

• University of Chittagong, Bangladesh **Jan. 2019 – Feb. 2021**
M.Sc, Electrical and Electronic Engineering *GPA 3.64/ 4.00*

• University of Chittagong, Bangladesh **Jan. 2015 – Dec. 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) *University of New Mexico*

Projects:

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

- Modelling a robust and efficient malware detection solution to safeguard the grid from malicious attacks
- Collection, parsing and preprocessing of large, labeled dataset of OCPP 2.0.1 JSON payloads between EV Charge Point (CP) and Charging Station Management System (CSMS).
- 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 and unsupervised learning methods.

Technical Skills: Languages– Python, SQL, Tools– Supervised and unsupervised machine learning.

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

- Modelling a resilient wireless communication system for heliostat fields to replace conventional wired networks.
- 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.

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 (Under Review).
- **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.
- **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 – Present**

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 – Present**

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 SmartGridComm 2023, IEEE ISCC 2022.

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*