

ABDULLAH AL MAMUN

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<https://scholar.google.com/citations?user=SOJ1o5QAAAAJ&hl=en>

PROFILE HIGHLIGHTS

- Computer Science (Machine Learning) Ph.D. Student & Course Instructor at Arizona State University.
- Published works in AAAI 2025, EMBC 2025, BSN 2023, BSN 2022, and EMBC 2022. Multiple journal submissions in review.
- Best Paper (Honorable Mention) Award winner at IEEE BSN 2022 conference.
- Outstanding Research Award winner at Fall 2024 ASU Graduate Student Government (GSG) Awards Program.
- Teaching Excellence Award winner at Fall 2024 ASU Graduate Student Government (GSG) Awards Program.
- Experienced in developing critical cybersecurity solutions for Windows, macOS, Ubuntu, and CentOS servers and workstations as a full-time software developer.

RESEARCH INTERESTS

Deep Learning, Explainable AI, Counterfactual Explanation, Mobile Health, Time-Series Forecasting, Generative Models

EDUCATION

Doctor of Philosophy - Computer Science

Expected September 2026

Arizona State University

GPA: 4.00

- Advisor: Dr. Hassan Ghasemzadeh.
- Selected courses: Reinforcement Learning, Embedded Machine Learning, Planning and Learning in AI, Knowledge Representation, Image Analytics & Informatics (completed 39 credit hours of graduate coursework).

Master of Science - Computer Science

May 2025

Arizona State University

GPA: 4.00

- Degree conferred on May 12, 2025. With Distinction.

Bachelor of Science - Computer Science and Engineering

October 2018

Bangladesh University of Engineering and Technology

GPA: 3.70

- Thesis: Comparative Analysis of Modern Garbage Collectors for Big Data in Distributed Systems.
- Selected courses: Data Structures, Algorithms, Compilers, Operating Systems, Microprocessors and Microcontrollers, Computer Architecture, Artificial Intelligence, Pattern Recognition, Databases (160 credits).

CURRENT ROLE

Graduate Research Associate & Instructor

Dec 2021 - Present

Arizona State University

Phoenix, Arizona

- Taught BMI 311: Modeling Biomedical Knowledge as the sole instructor in Fall 2024. Syllabus: AI architecture, Problem solving (principles, search, contingency, constraints), Reasoning under uncertainty, KNN, Random Forest, SVM, Neural networks, Validation methods, Genetic algorithm, Deep learning, Clustering.
- Supervised an undergraduate honors contract research project that led to an accepted IEEE EMBC conference paper.
- Graduate Research Associate at the Embedded Machine Intelligence Lab (<https://ghasemzadeh.com>).

PUBLICATIONS

1. **Designing Deep Neural Networks Robust to Sensor Failure in Mobile Health Environments.** A. Mamun, S. I. Mirzadeh, & H. Ghasemzadeh. *IEEE Engineering in Medicine and Biology Conference (EMBC 2022)*.
2. **Multimodal Time-Series Activity Forecasting for Adaptive Lifestyle Intervention Design.** A. Mamun, K. S. Leonard, M. P. Buman, & H. Ghasemzadeh. *IEEE Wearable and Implantable Body Sensor Networks (BSN 2022)*.
3. **Neonatal Risk Modeling and Prediction.** A. Mamun, C.-C. Kuo, D. W. Britt, L. D. Devoe, M. I. Evans, H. Ghasemzadeh, & J. Klein-Seetharaman. *IEEE Conference on Body Sensor Networks (BSN 2023)*.
4. **Domain-Informed Label Fusion Surpasses LLMs in Free-Living Activity Classification.** S. B. Soumma, A. Mamun, H. Ghasemzadeh. *AAAI Conference on Artificial Intelligence (AAAI'25) Extended Abstract*.

5. **Enhancing Metabolic Syndrome Prediction with Hybrid Data Balancing and Counterfactuals.** *S. P. Sah, A. Mamun, S. B. Soumma, H. Ghasemzadeh. IEEE Engineering in Medicine and Biology Conference (EMBC 2025).*
6. **Freezing of Gait Detection Using Gramian Angular Fields and Federated Learning from Wearable Sensors.** *S. B. Soumma, S. M. R. Alam, R. Mahi, U. N. Mahi, A. Mamun, S. M. Mostafavi, H. Ghasemzadeh. IEEE Engineering in Medicine and Biology Conference (EMBC 2025).*

OTHER RESEARCH WORKS

Journal submissions under review:

1. **AIMEN:** AIMEN uses an ensemble of fully-connected neural networks as the backbone for its classification with the data augmentation supported by either ADASYN or CTGAN. AIMEN can predict a high risk for adverse labor outcomes with an average F1 score of 0.784. It also provides counterfactual explanations that can be achieved by changing 2 to 3 attributes on average. Preprint: <https://arxiv.org/abs/2410.09635>.
2. **MoveSense:** Our multimodal LSTM with early fusion achieves 33% and 37% lower mean absolute errors than linear regression and ARIMA respectively on the prediabetes dataset. LSTM also outperforms linear regression and ARIMA with a margin of 13% and 32% on the sleep dataset. Preprint: <https://arxiv.org/abs/2410.09643>.
3. **AIMI:** We designed and developed CNN and LSTM-based forecasting models with various combinations of input features and found that LSTM models can forecast medication adherence with an accuracy of 0.93 and an F-1 score of 0.93. Preprint: <https://arxiv.org/abs/2503.16091>.

Reviewed 4 IEEE JBHI, 1 PerCom'23, 1 IEEE BHI'23, 5 CHIL'24, 6 IEEE BHI'24, 4 ML4H'24, 2 CHIL'25, and 1 EMBC'25 submissions.

Mentored research projects of undergraduate and high school students. Outcomes: Full-contributed accepted paper in IEEE EMBC 2025. 1-page technical abstract accepted at BSN 2024.

PRIOR EXPERIENCE

Teaching and Research Assistant

Washington State University

January 2021 - December 2021

Pullman, Washington

- Prepared and submitted a conference paper. Mentored undergraduate research. Helped over 100 students with homework and programming assignments in Advanced Data Structures C/C++, taught by Dr. Yan Yan.

Lecturer

United International University

September 2019 - January 2021

Dhaka, Bangladesh

- Taught five theoretical undergraduate courses: Software Engineering, Object-Oriented Programming, Digital System Design, Structured Programming Language, and System Analysis and Design.

Software Developer

HLC Technologies Limited

November 2018 - September 2019

Dhaka, Bangladesh

- Developed cybersecurity solutions for Windows, macOS, Ubuntu, and CentOS platforms, patch management and configuration monitoring tools, and online learning management systems.
- Reduced data transfer overhead by more than 90% after converting a query-based system to an alert reporting system. Developed tools and tutorials for easy deployment of software solutions on new servers.
- Led daily stand-up meetings. Implemented new features every sprint. Reviewed code and fixed bugs in large projects written by other developers.

SKILLS

Deep Learning: Time-series, Tabular data, Object detection, Image segmentation, Counterfactuals, Generative models.

Software Development: Python, Java, C, C++, ReactJS, Shell, Hadoop, Android, {My,Oracle,Postgre}SQL.

Critical Reasoning: GRE General Test (2019): Quant - 166 (P86), Verbal - 156 (P72), Writing - 4.0 (P54).

Communication Skills: Full professional proficiency in English. Taught a course as the sole instructor at ASU.

AWARDS & HONORS

- Master of Science (With Distinction) in Computer Science from Arizona State University (2025).
- Full Membership of Sigma Xi, The Scientific Research Honor Society (2025).
- ASU Graduate Student Government Travel Award for attending the AAAI 2025 Conference (2025).
- ASU Graduate College Travel Award for attending the AAAI 2025 Conference (2024).

- Outstanding Research Award at ASU Graduate Student Government (GSG) Awards Program (2024).
- Teaching Excellence Award at ASU Graduate Student Government (GSG) Awards Program (2024).
- Invited Talk: Time-Series Wearable Activity Forecasting at ASU Machine Learning Day (2023).
- IEEE Student Travel Award to attend the IEEE BSN 2023 conference (2023).
- Best Paper (Honorable Mention) Award at the IEEE BSN 2022 conference (2022).
- University Merit List Scholarship by Bangladesh University of Engineering and Technology (2017).