ABDULLAH AL MAMUN

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PROFILE HIGHLIGHTS

- Computer Science (Machine Learning) Ph.D. Student & Course Instructor at Arizona State University.
- Published works in AAAI 2025, BSN 2023, BSN 2022, and EMBC 2022. Three journal submissions in review.
- Best paper (honorable mention) award winner at IEEE BSN 2022 conference.
- 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 May 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).

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

Instructor & Graduate Research Associate **Dec 2021 - Present**
Arizona State University **Phoenix, Arizona**

- Teaching 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.
- GRA at the Embedded Machine Intelligence Lab (https://ghasemzadeh.com).

PUBLICATIONS

1. **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.*
2. **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).*
3. **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).*
4. **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).*

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 (under review).

Reviewed 4 IEEE JBHI, 1 PerCom'23, 1 IEEE BHI'23, 5 CHIL'24, 6 IEEE BHI'24, and 4 ML4H'24 submissions. *Mentored* research projects of undergraduate and high school students. Got 1-page abstract accepted at BSN 2024.

PRIOR EXPERIENCE

Teaching and Research Assistant **January 2021 - December 2021**
Washington State University **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 **September 2019 - January 2021**
United International University **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 **November 2018 - September 2019**
HLC Technologies Limited **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.

AWARDS & HONORS

- 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).