ABDULLAH AL MAMUN

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

EXPERTISE AND INTERESTS

Research Area: Trustworthy AI, Deep learning, Mobile health, Imbalanced medical datasets, Data collected in free-living environment, Challenging and low-quality datasets, Continual learning, Large language models
Core Expertise: Counterfactual explanations, Rare and sparse event detection, Data balancing and augmentation, Robust machine learning, Unsupervised learning, Missing data imputation, Time-series forecasting

EDUCATION

PhD, Computer Science, Arizona State University (GPA: 4.00) **All but Dissertation (Expected 2027)**
Advisor: Dr. Hassan Ghasemzadeh (hassan.ghasemzadeh@asu.edu)
Notable projects:

- Early detection of cerebral palsy with conditional GAN and ensemble neural networks (ACM Health'26)
- Hyperglycemia detection from diet and activity with LLMs and hybrid classifiers (Sensors'25)
- Medication adherence forecasting with RNN and continual learning for resource-constrained environments (Revision under review)
- Activity recognition from natural language labels with language encoding and unsupervised learning (AAAI'25)
- Stress detection from wearable sensor data (ongoing)
- Lead researcher in a project in building a foundation model for stress detection. (ongoing)
- Lead researcher in a project for building an LLM and RAG based meal recommendation system to manage hyperglycemia (ongoing).

Publication summary:

- Authored 16 research papers, 12 are published in peer-reviewed journals (6) and conferences (6) including ACM Health (IF: 8), Progress in Biomedical Engineering (IF: 7.7), Sensors Journal, AAAI 2025, and COBME Journal
- Contributed to 9 NSF and NIH funded projects in AI for Healthcare.

Teaching:

- Taught BMI 311: Modeling Biomedical Knowledge as the sole instructor in Fall 2024. Core topics: AI architecture, KNN, Random Forest, SVM, Neural networks, Validation methods, Deep learning, Clustering, etc.

Service:

- Reviewed 48 journal and conference submissions, including for top-tier venues such as IEEE JBHI and AAAI.
- Mentored undergraduate, master's, and high school students. Trained new PhD students.

MS (With Distinction), Computer Science, Arizona State University (GPA: 4.00) **May 2025**
Earned en route to the PhD.

BSc, Computer Science & Engineering, Bangladesh University of Engineering and Technology **Oct 2018**
Selected courses: Data Structures, Algorithms, Compilers, OS, Computer Architecture, Databases (160 credits).

TECHNICAL SKILLS

- **Deep Learning:** PyTorch, TensorFlow, Transformers, Large Language Models, Attention, Time-series, Tabular data, Object detection, Image segmentation, Counterfactuals, Generative models.
- **Software Development:** Python, Java, C, C++, ReactJS, Shell, iOS (Swift), Android, Linux, Nginx, HPC/Slurm, AWS/S3, DigitalOcean, SQL/database design, Hadoop, Deployment automation

AWARDS AND HONORS

- Best Paper (Honorable Mention) Award at the IEEE BSN 2022 conference (2022).
- Outstanding Research Award winner at Arizona State University GSG Awards (2024).
- Teaching Excellence Award winner at Arizona State University GSG Awards (2024).
- Invited talks at ASU Machine Learning Day (2023) and AZ Health Data Integration Meeting (2025).
- Multiple travel awards by IEEE, ASU Graduate College, and ASU GSG.

EXPERIENCE

Graduate Research Associate, Arizona State University (Phoenix, AZ, USA) **Dec 2021 - Present**

- Authored 16 papers as a researcher at the Embedded Machine Intelligence Lab (https://ghasemzadeh.com).
- Designed user studies, wrote IRB protocols, developed infrastructure, recruited participants, collected and analyzed data. Implemented API interfaces to access and process data on AWS S3, Spotify, Google Drive, etc.

Research and Teaching Assistant, Washington State University (Pullman, WA, USA) **Jan 2021 - Dec 2021**

- Submitted a paper. Helped over 100 students in Advanced Data Structures C/C++, taught by Dr. Yan Yan.

Lecturer, United International University (Dhaka, Bangladesh) **Sep 2019 - Jan 2021**

- Taught: Software Engineering, Java and C Programming, Digital System Design, System Analysis and Design.

Software Developer, HLC Technologies Limited (Dhaka, Bangladesh) **Nov 2018 - Sep 2019**

- Developed cybersecurity solutions for Windows, macOS, Ubuntu, and CentOS platforms, patch management and configuration monitoring tools, and online learning management systems. Implemented new features every sprint.

SELECTED PUBLICATIONS

Visit https://abdullah-mamun.com/publication/ or My Google Scholar Page for the comprehensive list.

1. **Use of What-if Scenarios to Help Explain Artificial Intelligence Models for Neonatal Health.** A. Mamun, L. D. Devoe, M. I. Evans, D. W. Britt, J. Klein-Seetharaman, & H. Ghasemzadeh. ACM Health (2026)
2. **LLM-Powered Prediction of Hyperglycemia and Discovery of Behavioral Treatment Pathways from Wearables and Diet.** A. Mamun, A. Arefeen, S. B. Racette, D. D. Sears, C. M. Whisner, M. P. Buman, H. Ghasemzadeh. Sensors (2025)
3. **Trustworthy AI in Digital Health: A Comprehensive Review of Robustness and Explainability.** A. Mamun, S. B. Soumma, H. Ghasemzadeh. Progress in Biomedical Engineering Journal (2026). Accepted version available upon request.
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 2025) Extended Abstract.
5. **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).
6. **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) (Best paper honorable mention award winner)
7. **AI-Powered Wearable Sensors for Health Monitoring and Clinical Decision Making.** S. B. Soumma, A. Mamun, H. Ghasemzadeh. Current Opinion in Biomedical Engineering Journal (2025)
8. **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).
9. **GluBox: Glucose Prediction for Type 1 Diabetes from Multimodal Wearable Sensors using Region-Sensitive Loss and Bayesian Optimization.** P. Khorasani, E. Farahmand, A. Mamun, H. Ghasemzadeh. IEEE Sensors Journal (2026).
10. **AIMI: Leveraging Future Knowledge and Personalization in Sparse Event Forecasting for Treatment Adherence**. A. Mamun, D. J. Cook, H. Ghasemzadeh. (revision under review)

ACADEMIC SERVICES

- 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.
- Reviewed 48 journal and conference submissions: 5 IEEE JBHI, 2 AAAI 2026, 6 AAAI 2027, 1 BHI'23, 6 BHI'24, 1 BHI'25, 2 BHI'26, 1 PerCom'23, 5 CHIL'24, 2 CHIL'25, 4 ML4H'24, 4 ML4H'25, 1 IEEE EMBC'25, 2 IEEE BSN'25, 4 BSN'26, 1 BMC Health Services Research Journal, and 1 Guthrie Clinic Journal of Medicine.
- Member of Program Committee: AAAI 2026, AAAI 2027