Saman Khamesian

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Education

- **Arizona State University (ASU)** *2024 – Present*
  Ph.D. Computer Science - Artificial Intelligence Tempe, AZ
  - GPA: 4.00/4.00
- **Shahid Beheshti University (SBU)** *2018 – 2021*
  M.Sc. Computer Engineering - Artificial Intelligence and Robotics Tehran, Iran
  - GPA: 3.88/4.00
- **Shahid Beheshti University (SBU)** *2014 – 2018*
  B.Sc. Computer Engineering Tehran, Iran
  - GPA: 3.64/4.00

Research Experience

- **Embedded Machine Intelligence Lab (EMIL)** *Jan 2024 - Present*
  Graduate Research Associate Phoenix, AZ
  - **Blood Glucose Forecasting for Type 1 Diabetes**: Developing methods to reduce abnormal glycemic events by improving the accuracy of blood glucose prediction in patients with Type 1 diabetes.
  - **Reinforcement Learning Framework for Type 1 Diabetes Management**: Partnering with the University of Texas at Austin through the NSF-funded ASU IFML ExpandAI project, this work develops an RL framework to support behavioral changes and improve glycemic control in individuals with Type 1 diabetes.
- **Mayo Clinic** *Mar 2024 - Present*
  Research Affiliate Phoenix, AZ
  - **Collecting and preparing the AZT1D Dataset:** Compiling data from Type 1 diabetes patients, including continuous glucose monitoring (CGM), insulin, carbohydrate, and other related data, to support research and analysis.
  - **ExActHealth Mobile Application:** Designing and implementing a mobile app that integrates smartwatch and user–input data to support real–time monitoring and personalized insights for individuals with Type 1 diabetes.

Publications

[C]=Conference | [J]=Journal | [S]=In Submission

[S.1] S. Khamesian, A. Arefeen, M. A. Grando, B. Thompson, and H. Ghasemzadeh, "Type 1 diabetes management using GLIMMER: Glucose level indicator model with modified error rate," arXiv:2502.14183, 2025. Manuscript submitted for publication in *Computers in Biology and Medicine*.

[S.2] A. Arefeen, S. Khamesian, M. A. Grando, B. Thompson, and H. Ghasemzadeh, "GlyTwin: Digital twin for glucose control in type 1 diabetes through optimal behavioral modifications using patient-centric counterfactuals," arXiv:2504.09846, 2025. Manuscript submitted for publication in *IEEE J. Biomed. Health Inform.*

[C.1] S. Khamesian, A. Arefeen, B. M. Thompson, M. A. Grando, and H. Ghasemzadeh, AZT1D: A real-world dataset for type 1 diabetes, in *Proc. IEEE-EMBS Int. Conf. Body Sensor Netw. (BSN)*, Los Angeles, CA, USA, Nov. 2025. (Accepted). [Online]. Available: https://arxiv.org/abs/2506.14789

[C.2] S. Khamesian, A. Arefeen, S. M. Carpenter, and H. Ghasemzadeh, NutriGen: Personalized meal plan generator leveraging large language models to enhance dietary and nutritional adherence, in *Proc. 47th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, Copenhagen, Denmark, July 2025. (Accepted). [Online]. Available: https://arxiv.org/abs/2502.20601

[C.3] A. Arefeen, S. Khamesian, M. A. Grando, B. Thompson, and H. Ghasemzadeh, "GlyMan: Glycemic management using patient-centric counterfactuals," in *Proc. IEEE Int. Conf. Biomed. Health Inform. (BHI)*, pp. 15, 2024. DOI: 10.1109/BHI62660.2024.10913587

[J.1] S. Khamesian and H. Malek, "Hybrid self-attention NEAT: A novel evolutionary self-attention approach to improve the NEAT algorithm in high dimensional inputs," *Evolving Syst.*, vol. 15, no. 2, pp. 489503, 2024. DOI: 10.1007/s12530-023-09510-3

Patents

[1] H. Zadeh and S. Khamesian, System and methods for blood glucose forecasting using custom loss functions, U.S. Provisional Patent **63/740,772**, filed Dec. 31, 2024.

[2] H. Zadeh, A. Arefeen, and S. Khamesian, System and methods for modeling and simulating glycemic response for behavioral lifestyle interventions, U.S. Provisional Patent **63/508,235**, filed Jun. 14, 2023.

Work Experience

- **Mofid Securities** *Oct. 2021 - Jun. 2023*
  Machine Learning Engineer Tehran, Iran
  - Designed a stock recommender system using market trends and user behavior to improve engagement.
  - Built LSTM-based models to improve forecasting accuracy and predict stock trading volumes.
  - Implemented spoof detection for eKYC using anomaly detection and video analysis, achieving 98% TPR at 5% FPR.
  - Partnered with data engineers, analysts, and product managers to deliver business-aligned technical solutions.

Skills

- **Programming Languages:** Python | Kotlin | Java | XML | C/C++ | MATLAB | VHDL
- **ML Libraries & Frameworks:** TensorFlow/Keras | PyTorch | scikit-learn | pandas | matplotlib | openAI gym
- **Operating Systems:** Linux (Ubuntu/CentOS) | macOS (High Sierra and later) | Windows (7 and later)
- **Other Tools & Technologies:** LaTex | git | Django | Parallel Programming | Swift Programming

Projects

- **NutriGen: Personalized Meal Plan Generator Using LLMs** *Mar. 2025*
  Tools: Jupyter Notebook, python, openAI gym, numpy, pandas [GitHub]
  - Developed an LLM-powered recommender system that generates personalized meals based on nutritional targets.
  - Integrated real-time nutrient analysis using USDA data and semantic search for enhancing user adherence.
- **GLIMMER: Glucose Level Indicator Model with Modified Error Rate** *Feb. 2025*
  Tools: python, tensorflow, scipy, scikit–learn, numpy, pandas [GitHub]
  - Designed a CNN–LSTM glucose forecasting model with a custom loss function targeting dysglycemic regions.
  - Achieved RMSE of 23.97 ($\pm$3.77) mg/dL and MAE of 15.83 ($\pm$2.09) mg/dL, improving RMSE by 23% and MAE by 31% over state-of-the-art baselines on both public (OhioT1DM) and private (AZT1D) datasets.
- **ExActHealth: A Mobile App for Food and Activity Tracking in T1D** *Feb. 2025*
  Tools: Android (Kotlin), LiveData, Material Components, Health Connect API, OkHttp, Gson, Firebase Crashlytics
  - Designed a cross-platform mobile app for structured food logging and real-time smartwatch health data collection.
  - Deployed in a 30–day clinical study at Mayo Clinic with 20 T1D participants, achieving 87% usability approval.
- **Hybrid Self-Attention NEAT: Evolving High-Dimensional Controllers** *Jun. 2023*
  Tools: python, opencv–python, openAI gym, scipy, torch, networkx, scikit–image, torchvision [GitHub]
  - Introduced a hybrid evolutionary algorithm combining NEAT and CMA–ES with a self–attention module to select relevant input features from high–dimensional data.
  - Achieved competitive scores on Atari games using raw pixel input, while reducing model size by ~300$\times$ compared to HyperNEAT and overcoming NEATs scalability limitations.
- **Time Series Classification for Human Activity Recognition** *Feb. 2020*
  Tools: python, tensorflow/keras, numpy, pandas [GitHub]
  - Built a CNNLSTM model on smartphone accelerometer data, achieving 88-92% classification accuracy.
  - Applied HAR smartphone dataset to classify six daily activities using raw timeseries input.
- **The Winton Stock Market Challenge** *Jan. 2020*
  Tools: python, scikit-learn, keras, matplotlib, numpy, pandas [GitHub]
  - Implemented an LSTM-based solution for predicting 5-day stock returns in Kaggles Winton challenge.
  - Performed feature-based time-series modeling using historical windowed data and custom loss design.
- **Imputation of Missing Values** *Jul. 2019*
  Tools: python, scikit–learn, scikit-fuzzy, numpy, pandas [GitHub]
  - Developed a fuzzy cmeans + SVR pipeline to impute 1-25% missing data across six UCI datasets.
  - Achieved median RMSE of 0.0215 and 92% accuracy in hold-out validation.
- **Credit Card Fraud Detection** *Jul. 2019*
  Tools: python, hidden-markov, scikit-learn, numpy, pandas [GitHub]
  - Designed an HMMbased anomaly detection system, reaching 81% fraud detection rate with 2% FPR.
  - Processed 100k transaction records with ~1% fraud labels in an imbalanced dataset.
- **TwoLevel Genetic Algorithm for Clustered TSP** *Jan. 2019*
  Tools: C/C++ [GitHub]
  - Developed a two-level genetic algorithm (TLGA) for clustered TSP.
  - Achieved 90% faster computation versus standard TSP heuristics on large datasets.

Honors and Awards

- **Travel Award** *Oct. 2024*
  IEEE-EMBS International Conference on Body Sensor Networks (BSN), Chicago, IL [🌐]
  ◦ Received travel award to attend IEEE BSN 2024
- **Ranked 198th in National M.Sc. Universities Entrance Examination** *Jun. 2018*
  National Organization for Educational Testing, Tehran, Iran
  ◦ Placed in the top 1% among over 19,000 candidates nationwide
- **Qualified for the 19th ACM/ICPC Asia Regional Programming Contest** *Nov. 2017*
  University of Tehran, Tehran, Iran [🌐]
  ◦ Received Honorable Mention at the 15th Iran Internet Programming Contest
- **Ranked 12th in the 18th ACM/ICPC Asia Regional Programming Contest** *Dec. 2016*
  IBM, Tehran, Iran [🌐]
  ◦ Placed 12th among 100 university teams across the Asia region

Volunteer Experience

- **Nominated as Reviewer** *Jul. 2025*
  IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI) [🌐]
  ◦ Reviewed 6 papers on wearable sensors, digital twins, and explainable AI
  ◦ Supported the peer-review process and upheld fair evaluation standards
- **Nominated as Reviewer** *Aug. 2025*
  IEEE-EMBS International Conference on Body Sensor Networks (BSN) [🌐]
  ◦ Reviewed 3 papers on body sensor networks, wearable sensors, and explainable AI
  ◦ Contributed to the scientific review process by providing constructive feedback and ensuring research quality
- **Teaching Assistant Roles in Undergraduate Courses** *2015 - 2019*
  Department of Electrical and Computer Engineering, Shahid Beheshti University (SBU), Tehran, Iran
  ◦ Served as Head TA for core courses including *Data Structures* and *Discrete Mathematics*.
  ◦ Acted as TA for several other courses, including *Algorithm Design*, *Advanced Programming (Java)*, and *VHDL*.