Riyad Bin Rafiq
Email: riyadrafiq@gmail.com
Personal website: https://riyadrafiq.github.io/
Google Scholar: https://scholar.google.com
Github: https://github.com/riyadRafiq

Education

- **University of North Texas** *Jan 2021 - May 2026*
  Ph.D. Candidate in Computer Science and Engineering GPA: 4.0 / 4.0
  Advisor: Mark V. Albert, Ph.D
  Co-advisor: Weishi Shi, Ph.D

- **University of North Texas** *Jan 2021 - May 2024*
  M.S. in Artificial Intelligence GPA: 3.9 / 4.0

- **Chittagong University of Engineering and Technology** *Mar 2014 - Dec 2018*
  B.Sc. in Computer Science and Engineering

Experience

Graduate Research Assistant, Biomedical AI Lab *Jan 2021 - Present*

- **Wearable Gesture Recognition System for Motor-impaired individuals:**
  - Applied large language model (LLM) reasoning to enhance wearable gesture recognition, improving adaptability and performance under limited training data.
  - Designed and implemented a few-shot continual learning framework for wearable hand gesture recognition, achieving up to 69.3% accuracy with only five samples.
  - Developed a mobile app prototype that translates hand gestures into audible speech.

- **Rehabilitation and ML Validation:**
  - A feasibility study of using computerized adaptive testing (CAT) for rehabilitation inpatients.
  - Provided an overview of common limitations and their solutions in machine learning model validation for medical applications.

Graduate Teaching Assistant, University of North Texas *Aug 2021 - Present*

- **CSCE 5218 Deep Learning:** Utilized minitorch to prepare assignments and assisted students in completing them.
- **CSE 5280 AI for Wearables and Healthcare:** Guided students throughout the project, from brainstorming ideas to final implementation. Additionally, I assisted instructors in creating exam questions and grading assignments.
- **CSCE 1030 Computer Science I:** Instructed a lab class where I helped freshman students solve programming problems utilizing C++. I also assisted students in completing their projects.
- **Others:** CSCE 5215 Machine Learning, CSCE 4110 Algorithms, NSF-ReU Summer Research.

Software Engineer, JMJ CODE *Oct 2020 - Dec 2020*

- **Application development:** Contributed to developing different web application modules for online vendors. Technologies: ASP .NET, HTML, CSS, JavaScript, MySQL.

Research Student *Jan 2018 - Mar 2019*

- **OptiFit:** Developed a mobile application that automatically measures four foot dimensions (length, width, arch

height, and instep girth) from images and 3D scans, achieving 95% measurement accuracy.

- **Vision-based Bengali Sign Language Detection:** Implemented a real-time automated translation system utilizing Convolutional Neural Networks to translate Bengali sign language into Bengali words.

Technical Knowledge

- Programming: Python, C++, Matlab
- ML Frameworks: TensorFlow, Keras, PyTorch
- Deep Learning: Neural Networks, CNN, LSTM, Transformers, Few-shot continual learning, LLMs, etc.

Publications

- **Rafiq RB,** Shi W, Albert MV (2025). KARL: Knowledge-Attentive Representation Learning for Wearable Hand Gesture Recognition in Motor-Impaired Individuals. *40th **AAAI*** (Submitted).
- **Rafiq RB,** Shi W, Albert MV (2024). Wearable Sensor-Based Few-Shot Continual Learning on Hand Gestures For Motor-Impaired Individuals via Latent Embedding Exploitation. *33rd International Joint Conference on Artificial Intelligence (**IJCAI**)*.
- **Rafiq RB,** Karim SA, Albert MV (2023). An LSTM-based Gesture to Speech Recognition System. *IEEE 11th International Conference on Healthcare Informatics (**ICHI**)*.
- **Rafiq RB,** Yount S, Jerousek S, Roth EJ, Cella D, Albert MV, Heinemann AW (2023). Feasibility of PROMIS using Computerized Adaptive Testing during Inpatient Rehabilitation. ***Journal of Patient-Reported Outcomes***.
- **Rafiq RB**, Hoque KM, Kabir MA, Ahmed S, Laird C (2022). *OptiFit*: Computer Vision-based Smartphone Application to Measure the Foot from Images and 3D Scans. ***Sensors***.
- **Rafiq RB,** Hakim SMA, Tabashum T (2021). Real-time Vision-based Bangla Sign Language Detection Using Convolutional Neural Network. *10th International Conference on Advances in Computing and Communications (**ICACC**)*.
- **Rafiq RB,** Modave F, Guha S, Albert MV (2020). Validation Methods to Promote Real-world Applicability of Machine Learning in Medicine. *3rd International Conference on Digital Medicine and Image Processing (**DMIP**)*.

Open-Sourced Projects

- FSCL on Wearable Hand Gesture [Github]
- Bangla Sign Language Detection [Github]

Achievements and Services

- Served as a Program Committee member in AAAI-AISI 2025.
- Computer Research Association UR2PhD Graduate Student Mentor Training Course (Scholarship 2024).
- Selected to participate in the Neuromatch Academy 3-week Deep Learning Course (2021).
- Served as Graduate Advisor for UNT AI/CS Summer Research Program (2021, 2022, 2023).
- Organized a technical session titled “Best Practices for Validating Machine Learning in Medicine” at the Tapia Conference 2020.
- Tapia Scholarship (2020).
- CUET Scholarship (2014).