

Riyad Bin Rafiq

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Education

- **University of North Texas** *Jan 2021 - Dec 2025*
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:** A fast and flexible gesture recognition system that uses wearable sensor data from motor-impaired people who cannot speak. The primary focus is enhancing the custom gesture learning strategy by implementing transfer learning, meta-learning, and continual learning techniques using a few training examples [1, 2, 3].
- **Rehabilitation and ML Validation:** The feasibility of using computerized adaptive testing (CAT) on tablet computers for rehabilitation inpatients was evaluated [4]. The ML validation work provided an overview of common limitations and their solutions in machine learning model validation for medical applications [5].

Graduate Teaching Assistant, University of North Texas *Jan 2021 - May 2023*

- **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 graded assignments.
- **CSCE 1030 Computer Science I:** Spent three hours instructing a lab class where I helped freshman students solve programming problems utilizing C++. I also assisted students in completing their projects.
- **NSF-ReU Summer Research:** During a 10-week summer research program, I guided undergraduate and graduate students, facilitating their research activities and implementing ideas.

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:** A smartphone application, *OptiFit* provides the functionality to automatically measure the four essential dimensions (length, width, arch height, and instep girth) of a human foot from images and 3D scans [6].

- **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 [7].

Technical Knowledge

- Programming: Python, C++, Matlab
- Machine Learning: PCA, SVM, Neural Networks, CNN, LSTM, Transformers, etc.
- ML Tools: TensorFlow, Keras, PyTorch
- Application Development (Android and Web)

Publications

- [1] **Rafiq RB**, Shi W, Albert MV (2024). “KARL: Knowledge-Attentive Representation Learning for Wearable Hand Gesture Recognition in Motor-Impaired Individuals”. *39th AAAI Conference*. (Submitted)
- [2] **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)*.
- [3] **Rafiq RB**, Karim SA, Albert MV (2023). “An LSTM-based Gesture to Speech Recognition System”. *IEEE 11th International Conference on Healthcare Informatics (ICHI)*.
- [4] **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*.
- [5] **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)*.
- [6] **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*.
- [7] **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)*.

Open-Sourced Projects

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

Relevant Certification and Course

- Deep Learning, Spring’22, UNT.
- Machine Learning, Fall’21, UNT.
- AI for Wearables and Healthcare, Fall’21, UNT.
- [Deep Learning](#) by [Neuromatch Academy](#), Summer’21.
- Software Development for AI, Spring’21, UNT.
- [Deep Learning](#), [Machine Learning](#), IBM Data Science; Coursera 2019-20.