

Riyad Bin Rafiq

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Education

- **University of North Texas** *Jan'21 - Dec'25*
Ph.D. Candidate in Computer Science and Engineering; Cumulative GPA: 4.0 (Present)
Advisor: [Mark V. Albert](#), Ph.D
Co-advisor: [Weishi Shi](#), Ph.D
- **University of North Texas** *Jan'21 - May'24*
Master of Science in Artificial Intelligence - Machine Learning
- **Chittagong University of Engineering and Technology** *Mar'14 - Dec'18*
Bachelor of Science in Computer Science and Engineering

Experience

- **Graduate Research Assistant, [Biomedical AI Lab](#)** *Jan'21 - Present*
 - **Wearable Gesture Recognition System:** We are working on 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].
 - **Rehabilitation and ML Validation:** Our recent work in patient-reported outcomes evaluated the feasibility of using computerized adaptive testing (CAT) on tablet computers for rehabilitation inpatients, focusing on staff workload and the prevalence of elevated T-scores across six PROMIS measures [3]. The ML validation work provided an overview of common limitations in machine learning model validation methods within medicine, proposing solutions to enhance the reliability of these models for medical applications [4].
- **Graduate Teaching Assistant, University of North Texas** *Jan'21 - May'23*
 - **CSCE 5218 Deep Learning:** Utilized minitorch to prepare assignments and assisted students in completing and understanding them. Additionally, I graded assignments and offered explanations for topics students may have missed during class.
 - **CSE 5280 AI for Wearables and Healthcare:** Provided students guidance throughout the project process, from brainstorming ideas to final implementation. Additionally, I assisted instructors in creating exam questions and graded student 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 assisting in implementing ideas.
 - **Other courses:** CSCE 5215 Machine Learning (Spring'22), CSCE 4110 Algorithms (Spring'22).
- **Software Engineer, JMJ CODE** *Oct'20 - Dec'20*
 - **Application development:** Contributed to developing different modules of a web application for online vendors. Technologies: ASP .Net, HTML, CSS, Javascript, MySQL.

- **Research Student**

Jan'18 - Mar'19

- **OptiFit:** Research on implementing a smartphone application, *OptiFit* that 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 [5].
- **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. Our system operates seamlessly on common computing environments, such as a computer and a generic webcam [6].

Technical Knowledge

- Machine Learning and Deep Learning: Python, Tensorflow, Keras, Scikit-learn
- Android Application Development
- Web Application Development: HTML, CSS, Javascript, ASP .NET

Publications

- [1] **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)*.
- [2] **Rafiq RB**, Karim SA, Albert MV (2023). "An LSTM-based Gesture to Speech Recognition System". *IEEE 11th International Conference on Healthcare Informatics*.
- [3] **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*, 7 (1), 1-9.
- [4] **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*, pages 13-19
- [5] **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* 22 (23), 9554.
- [6] **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*, pages 1-5.

Poster Presentations

- **Rafiq RB**, Karim SA, Liu A, Albert MV. "A gesture-to-speech recognition mobile application prototype" American Congress of Rehabilitation Medicine (ACRM 2021) Sep 26-29, 2021.
- **Rafiq RB**, Modave F, Guha S, Albert MV. "Validation Methods to Promote Real-world Applicability of Machine Learning in Medicine" ACM Tapia Conference Sep 16-19, 2020.

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.