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: 3.89 (Present)
  Co-advisor: Mark V. Albert, Ph.D
  Co-advisor: Weishi Shi, Ph.D

- **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*
  - **Gesture Recognition System:** Currently, working to develop a customized gesture recognition system using accelerometer data to generate audible responses, particularly for those who lack fine motor skills. The primary focus is enhancing the custom gesture learning strategy through the implementation of transfer learning and continual learning techniques using a few training examples [1, 2].

  - **PROMIS:** This study aimed to assess the feasibility of employing computerized adaptive testing (CAT) on a tablet computer for administering patient-reported outcome measures in rehabilitation inpatients, while also examining the workload impact on staff and identifying the prevalence of elevated T-scores across six PROMIS measures [3].

  - **ML Validation in Medicine:** This study aimed to present an overview of the common limitations of machine learning model validation methods in the field of medicine, followed by solutions aimed at addressing these limitations. Our focus was on enhancing the reliability of machine learning models specifically tailored 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 provided assistance to students in completing and understanding them. Additionally, I graded assignments and offered explanations for any topics that students may have missed during class.

  - **CSE 5280 AI for Wearables and Healthcare:** Provided guidance to students throughout the entire 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++. Also, provided assistance to students in completing their projects.

  - **NSF-ReU Summer Research:** During a 10-week summer research program, I provided guidance to undergraduate and graduate students, facilitating their research activities and assisting in the implementation of ideas. Additionally, I offered explanations on relevant topics essential for their research endeavors.

  - **Other courses:** CSCE 5215 Machine Learning (Spring'22), CSCE 4110 Algorithms (Spring'22).

- ***Software Engineer,*** *JMJ CODE* *Oct'20 - Dec'20*
  - **Application development:** Contributed in 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 Bangla Sign Langugae Detection:** Implemented a real-time automated translation system utilizing convolutional neural networks to translate Bangla sign language into Bangla text. 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 IJCAI.* (Submitted)

[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.