Md. Rezwanul Haque

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Career Objective

Looking for a career to demonstrate the best of my professional ability, research thinking, and strategies to improve my knowledge, as well as to contribute to the best of my potential in my institution.

Research Interests

Deep Learning, Multimodal Machine Learning, Large Language Models, and Multimodal AI Agent.

Academic Credentials

May, 2024 – Present
MASc in Electrical and Computer Engineering (ECE),
University of Waterloo, Canada.
Supervisor: Prof. Fakhri Karray, Department of ECE, University of Waterloo.
Conducting research focusing on Multimodal Machine Learning (MMML) and Large Language Models (LLMs). Completed 5 MASc courses with an average grade of 90+; **expected degree completion in Fall 2025**.

2015 – 2019
Bachelor of Science in Computer Science and Engineering (CSE),
Khulna University of Engineering & Technology (KUET), Bangladesh.

Research Works

Published Articles

○ **Md. Rezwanul Haque**, S. M. Taslim Uddin Raju, Md. Asaf-uddowla Golap, M.M.A Hashem, *"A Novel Technique for Non-Invasive Measurement of Human Blood Component Levels from Fingertip Video Using DNN Based Models"*, IEEE Access, IEEE, vol. 9, pp. 19025–19042, Jan. 2021. **[Impact Factor: 3.4, Q1]**

○ Md. Asaf-uddowla Golap, S. M. Taslim Uddin Raju, **Md. Rezwanul Haque**, M.M.A Hashem, *"Hemoglobin and Glucose Level Estimation from PPG Characteristics Features of Fingertip Video Using MGGP-Based Model"*, Biomedical Signal Processing and Control, Elsevier. vol. 67, pp. 102478, Mar. 2021. **[Impact Factor: 5.076, Q1]**

○ Shah Muhammad Amzat Ullah, Md. Milon Islam, Saifuddin Mahmud, Sheikh Nooruddin, S.M. Taslim Uddin Raju, **Md. Rezwanul Haque**, *"Scalable Telehealth Services to Combat Novel Coronavirus (COVID-19) Pandemic"*, SN Computer Science, Springer Nature, vol. 2, no. 1, pp. 18, Jan. 2021.

○ Md. Milon Islam, **Md Rezwanul Haque**, Hasib Iqbal, Md. Munirul Hasan, Mahmudul Hasan, Muhammad Nomani Kabir, *"Breast Cancer Prediction: A Comparative Study Using Machine Learning Techniques"*, SN Computer Science, Springer Nature, vol. 1, no. 5, pp. 290, Sep. 2020.

○ Amanullah Asraf, Md. Zabirul Islam, **Md. Rezwanul Haque**, Md. Milon Islam, *"Deep Learning Applications to Combat Novel Coronavirus (COVID-19) Pandemic"*, SN Computer Science, Springer Nature, vol. 1, no. 6, pp. 363, Nov. 2020.

Conference Papers

○ **Md Rezwanul Haque**, Md. Milon Islam, S M Taslim Uddin Raju, and Fakhri Karray, *"A Signer-Invariant Conformer and Multi-Scale Fusion Transformer for Continuous Sign Language Recognition"*, Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshop, 2025. **[Accepted]**

○ Md. Milon Islam, **Md Rezwanul Haque**, S M Taslim Uddin Raju, and Fakhri Karray, *"FusionEnsemble-Net: An Attention-Based Ensemble of Spatiotemporal Networks for Multimodal Sign Language Recognition"*, Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshop, 2025. **[Accepted]**

- **Md Rezwanul Haque**, Md. Milon Islam, S M Taslim Uddin Raju, Hamdi Altaheri, Lobna Nassar, and Fakhri Karray, *"MDD-Net: Multimodal Depression Detection through Mutual Transformer"*, IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2025. [**Accepted**]

- **Md Rezwanul Haque**, Md. Milon Islam, S M Taslim Uddin Raju, Hamdi Altaheri, Lobna Nassar, and Fakhri Karray, *"MMFformer: Multimodal Fusion Transformer Network for Depression Detection"*, IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2025. [**Accepted**]

- S M Taslim Uddin Raju, Md. Milon Islam, **Md Rezwanul Haque**, Hamdi Altaheri, and Fakhri Karray, *"GNN-ViTCap: GNN-Enhanced Multiple Instance Learning with Vision Transformers for Whole Slide Image Classification and Captioning"*, International Joint Conference on Neural Networks (IJCNN), 2025. [**Accepted**]

- Mahmuda Rumi, Barkat Ullah, **Md. Rezwanul Haque**, Abdullah Al Noman, Emranul Haque, and Feroz Ahmed, *"Smartphone Based BP Level Monitoring System Using DNN Model"*, In 2023 International Conference on Advanced Technologies for Communications (ATC), pp. 12–18, 19-21 Oct. 2023.

- Mahmuda Rumi, Barkat Ullah, **Md. Rezwanul Haque**, Abdullah Al Noman, Emranul Haque, and Dr. Feroz Ahmed *"Body Weight Estimation Using Smartphone Based Photoplethysmography Signal"*, 26th International Conference on Computer and Information Technology (ICCIT), pp. 1-6, 13-15 Dec. 2023.

- Ansary et al. *"BaDLAD: A Large Multi-Domain Bengali Document Layout Analysis Dataset"*, ICDAR 2023: Document Analysis and Recognition - ICDAR, pp. 326–341, 19 Aug. 2023.

- **Md. Rezwanul Haque**, Md. Milon Islam, Hasib Iqbal, Md. Sumon Reza, Md. Kamrul Hasan, *"Performance Evaluation of Random Forests and Artificial Neural Networks for the Classification of Liver Disorder"*, Proc. International Conference on Computer, Communication, Chemical, Material and Electronic Engineering (IC4ME2), IEEE, Rajshahi, Bangladesh, pp. 1-5, 8-9 Feb. 2018.

Under Review

- S M Taslim Uddin Raju, **Md Rezwanul Haque**, Md. Milon Islam, Hamdi Altaheri, and Fakhri Karray *"ClusGNN-ViT: Integrating Deep Embedded Clustering and GNN-MIL for Microscopic Image Captioning and Diagnosis"*, IEEE Transactions on Computational Imaging, 2025.

Scholarships

Winter 2025	**Faculty of Engineering (FOE) Award** from University of Waterloo, Canada.
Winter 2025	**Graduate Student Contingency Bursary** from University of Waterloo, Canada.
2015 – 2018	**Technical Scholarship** from Khulna University of Engineering & Technology, Bangladesh.

Google Scholar Citations, Online Contest Programming and Activities

Google Scholar.
- **Citations:** 1000+

UVA.
- Problems Solved: 100+

Codeforces.
- Problems Solved: 350+

Stack Overflow.
- **Reputation:** 2900+

Teaching Experience

Jan. – April, 2025 — **ECE 459: Programming for Performance at University of Waterloo, Canada**.
- Spring 2025
- Enrolled Students: 453
- TA Rating: -.-/5

Sept. – Dec., 2024; May – Aug. 2025 — **ECE 252: Systems Programming and Concurrency at University of Waterloo, Canada**.
- Fall 2024, Spring 2025
- Enrolled Students: 206 (Fall 2025), 122 (Spring 2025)
- TA Rating: 4.5/5

Job Experience

Mar. 2021 – Apr. 2024
Machine Learning Engineer at Apsis Solutions Ltd., Dhaka, Bangladesh.
- Bangla Handwritten and Printed OCR
- Deploying requirement-based OCR API's
- Virtual Personal Assistant (VPA): QA
- Text Normalization

Jan. – Apr. 2024
Machine Learning Consultant at EBLICT-Dream71 Bangladesh Ltd., Bangladesh.
- Bangla Virtual Private Assistant

Jan. 2021 – Apr., 2024
Computer Vision and NLP Researcher at Bengali.AI, Bangladesh.
- Bengali OCR (Handwritten Text & Printed Text)
- Document Layout Analysis (DLA)
- Grapheme Parsing and Unicode Normalization
- Bengali Common Voice Speech

Jan. – Nov., 2022
Part-Time Research Engineer at Independent University, Bangladesh (IUB).
- **Department:** Electrical and Electronic Engineering (EEE).
- **Research Title:** *Design of a Highly Efficient & Non-Invasive Measurement Device of Human Blood Component Levels using Genetic Algorithm & DNN Based Models.*

Relevant Online Courses

1. **Quantum Machine Learning**, *edx*.
2. **Deep Learning Specialization**, *Coursera*.
3. **Deep Learning with Python and PyTorch**, *edx*.
4. **Machine Learning**, *Stanford University*.

Technical Skills

Languages: Python, C, C++, Java, Swift, Matlab, R
Library: PyTorch, Tensorflow, Keras
Utilities: Git, LaTex, Anaconda, CISCO Packet Tracer
OS: Ubuntu, Windows, Kali-Linux, iMac

Academic Projects

April 2018
Image Captioning Project, *Supervisor: Dr. Md. Milon Islam, Asst. Prof., CSE, KUET*.
- **Technology:** CNN encoder with InceptionV3 model, RNN decoder with LSTM; Language: Python; Toolkits: Keras, TensorFlow; IDE: Jupyter-notebook.
- **Details:** In this project, I define and train an image-to-caption model that can produce descriptions for real-world images.

October 2017
Traffic Sign Classification, *Supervisor: Dr. Md. Milon Islam, Asst. Prof., CSE, KUET*.
- **Technology:** Deep Learning, CNN; Toolkits: Keras, OpenCV; Language: Python; IDE: Jupyter-notebook.
- **Details:** Detecting and Classifying Traffic signs with CNN for German Traffic Dataset.

Data Science Competition

Kaggle, Username: rezwan249.
- LANL Earthquake Pred. (Pos: 710, Top – 16%)
- Toxic Comment Classification (Pos: 1420, Top – 32%)
- Bengali.AI Handwritten Grapheme Class (Pos: 1941)
- 2019 Data Science Bowl (Pos: 2317)
- Predict future sales (Pos: 260, Top – 23%)
- RSNA-STR Pulmonary Embolism Detection (Pos: 610)

Experiences and Voluntary Work

2025 **Reviewer**, *IEEE International Conference on Systems, Man, and Cybernetics (SMC), Vienna, Austria*.

2025 **Reviewer**, *International Joint Conference on Neural Networks (IJCNN), Rome, Italy*.

2023 **Reviewer**, *PLOS One: A peer-reviewed open access scientific journal*.

2018 **Participant**, *2018 International Conference on Computer, Communication, Chemical, Material and Electronic Engineering (IC4ME2), Rajshahi University, Rajshahi, Bangladesh*.

2017 **Volunteer**, *University-Industry Collaboration: Challenges and Opportunities, KUET, Khulna, Bangladesh*.

2017 **Volunteer**, *3rd International Conference on Electrical Information and Communication Technology (EICT), KUET, Khulna, Bangladesh*.

2018 – 2019 **Instructor**, *Hardware Acceleration Club of KUET (HACK), KUET*.

2015 – 2019 **Instructor**, *Special Group Interested in Programming Contest (SGIPC), KUET*.

2015 – 2017 **Event Organizer**, *NHSPC (National High School Programming Contest)*.

2014 **Participant**, *Regional Mathematical Olympiad 2014, Rajshahi, Bangladesh*.