Md. Rezwanul Haque

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Google Scholar: Md. Rezwanul Haque
ResearchGate: Md. Rezwanul Haque

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

Artificial Intelligence, Machine Learning, Deep Learning, MMML, LLMs, Multi-Modal 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 at the Centre for Pattern Analysis and Machine Intelligence (CPAMI) Lab, focusing on Multi-Modal 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.

2012 – 2014
Higher Secondary Certificate (HSC),
Rajshahi Govt. City College, Bangladesh.

2007 – 2012
Secondary School Certificate (SSC),
Balahar B.L. High School, 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.

- Laboni Akter, Ferdib-Al-Islam , Md. Milon Islam, Mabrook S. Al-Rakhami, **Md. Rezwanul Haque**, *"Prediction of Cervical Cancer from Behavior Risk Using Machine Learning Techniques"*, SN Computer Science, Springer Nature, vol. 2, no. 3, pp. 1–10, 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.

○ **Md. Rezwanul Haque**, Md. Milon Islam, Kazi Saeed Alam, Hasib Iqbal, Md. Ebrahim Shaik, *"A Computer Vision based Lane Detection Approach"*, International Journal of Image, Graphics and Signal Processing(IJIGSP), vol. 11, no. 3, pp. 27-34, 2019.

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), 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), 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 Dr. Feroz Ahmed *"Smartphone Based BP Level Monitoring System Using DNN Model"*, In 2023 International Conference on Advanced Technologies for Communications (ATC), 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), 2023

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

○ Md. Milon Islam, Hasib Iqbal, **Md. Rezwanul Haque**, Md. Kamrul Hasan, *"Prediction of Breast Cancer Using Support Vector Machine and K-Nearest Neighbors"*, Proc. IEEE Region 10 Humanitarian Technology Conference (R10-HTC), IEEE, Dhaka, Bangladesh, pp. 226-229, 21-23 Dec. 2017

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

Undergraduate Thesis

○ **Title:** "A Study on Non-Invasive Hemoglobin Measurement Techniques and Predictions."
Supervisor: Prof. Dr. M.M.A Hashem, Dept. of Computer Science and Engineering (CSE), KUET
Details: This research is based on a non-invasive way to measure the hemoglobin level. We took about 10 seconds of video for each subject from body organs like an index finger by different Led-Board. We applied image processing techniques for features extraction. For best features selection, we used genetic algorithm. Finally, we applied different machine learning techniques on selected features to predict the hemoglobin level.

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

March 2021 – Present

Machine Learning Engineer at Apsis Solutions Ltd., Dhaka, Bangladesh.
- *Bangla Handwritten and Printed OCR*
- *Deploying requirement-based OCR API's*
- *Integrading Web Streamlit and Basic Laravel for Visualization*
- *Virtual Personal Assistant (VPA): QA*
- *Bangla Text Normalization*
- *National Identity (NID) card detection and recognition*

January 2024 – Present

Machine Learning Consultant at EBLICT-Dream71 Bangladesh Ltd., Bangladesh.
- *Bangla Virtual Private Assistant*

2021 – Present

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*

January – November, 2022

Part-Time Research Engineer at Independent University, Bangladesh (IUB).
- **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

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

Technical Skills

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

Academic Projects

April 2018

Image Captioning Project, *Supervisor: 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: 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.

Scholarships

Winter 2025 — **Faculty of Engineering (FOE) Award** from University of Waterloo, Canada

2025 — **Graduate Student Contingency Bursary** from University of Waterloo, Canada

2015 – 2018 — **Technical Scholarship** from Khulna University of Engineering & Technology, Bangladesh

Online Contest Programming and Activities, Google Scholar Citations

UVA.
- **Handle:** harry_potter_28
- Problems Solved: 100+

Codeforces.
- **Handle:** harry_potter_28 (Max Rate: 1389)
- Problems Solved: 350+

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

Google Scholar.
- **Citations:** 1100+

Data Science Competition

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

Experiences and Voluntary Work

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

2020   **Reviewer**, *Journal of Pharmaceutical Research International*.

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