

# Md Rezwatul Haque

PHD STUDENT, UNIVERSITY OF WATERLOO, CANADA | ML SCIENTIST & ENGINEER

✉ rezwan@uwaterloo.ca | 🌐 rezwanh001.github.io | 🐦 @rezwan249

*My career spans top academic institutions, including the **University of Waterloo (UW), Canada (CA)** and **Khulna University of Engineering & Technology (KUET), Bangladesh (BD)**. As a machine learning specialist, I have collaborated with multidisciplinary teams in academia and industry, contributing to impactful research and real-world AI solutions. I possess a strong publication record in top-tier venues and have been recognized for my contributions to data science and applied machine learning. My research focuses on Agentic Systems for Embodied AI, including Multi-Agent Embodied Systems with Shared Visual Understanding, as well as World Models and Visual Cognition for Embodied Agents.*

## EDUCATION

### University of Waterloo

PHD STUDENT IN ELECTRICAL AND COMPUTER ENGINEERING (ECE)

**Waterloo, CA**

May 2026 – p.

- **Supervisor(s):** Prof. Fakhri Karray & Prof. Zhou Wang
- **Research Focus:** Agentic Systems for Embodied AI, Multi-Agent Embodied Systems with Shared Visual Understanding, and World Models and Visual Cognition for Embodied Agents.

### University of Waterloo

MASc IN ELECTRICAL AND COMPUTER ENGINEERING (ECE)

**Waterloo, CA**

May 2024 – April 2026.

- **Thesis:** “Audio-Visual Feature Fusion through Transformers for Automated Depression Screening in Social Media Content.”
- **Supervisor(s):** Prof. Fakhri Karray & Prof. Pin-Han Ho

### Khulna University of Engineering & Technology (KUET)

BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND ENGINEERING (CSE)

**Khulna, BD**

Dec. 2014 - Feb. 2019

- **Thesis:** “A Study on Non-Invasive Hemoglobin Measurement Techniques and Predictions.”
- **Supervisor(s):** Prof. Dr. M.M.A Hashem

## EMPLOYMENT

### University of Waterloo

GRADUATE RESEARCH ASSISTANT

**Waterloo, CA**

May 2024 – p.

- Centre for Pattern Analysis and Machine Intelligence (CPAMI) Lab

### University of Waterloo

TEACHING ASSISTANT

**Waterloo, CA**

Sept. 2024 - p.

- ECE 222: Digital Computers (Fall 2025) – **Students: 300**
- ECE 459: Programming for Performance (Winter 2025, Winter 2026) – **Students: 453, 440**
- ECE 252: Systems Programming and Concurrency (Fall 2024, Spring 2025) – **Students: 206, 210**

### Apsis Solutions Ltd.

MACHINE LEARNING ENGINEER

**Dhaka, BD**

Mar. 2021 - Apr. 2024

- Developed and implemented models for Bangla Handwritten and Printed OCR.
- Engineered and deployed requirement-based OCR APIs for various applications.
- Worked on Quality Assurance (QA) and Text Normalization for a Virtual Personal Assistant (VPA).

### EBLICT-Dream71 Bangladesh Ltd.

MACHINE LEARNING CONSULTANT

**Dhaka, BD**

Jan. 2024 - Apr. 2024

- Provided expertise and development support for a Bangla Virtual Private Assistant.

### Bengali.AI

COMPUTER VISION AND NLP RESEARCHER


**Dhaka, BD**

Jan. 2021 - Apr. 2024

- Conducted research and development for Bengali OCR on both handwritten and printed text.
- Worked on core NLP tasks including Grapheme Parsing, Unicode Normalization, and building a Bengali Common Voice Speech dataset.
- Developed models for Document Layout Analysis (DLA) to understand document structures.

- In the Electrical and Electronic Engineering (EEE) department, conducted research on designing a highly efficient, non-invasive device for measuring human blood component levels using Genetic Algorithms and DNN-based models.

## PUBLICATIONS

My work on multimodal, explainable, and reliable AI has been presented at top-tier conferences (*CVPR, ICCV, IJCNN, SMC, etc.*) and published in leading journals (*IEEE Access, Elsevier, Springer, etc.*). I have made contributions to substantial research on computer vision, biological diagnostics, and human-AI interaction; a number of my publications have received remarkable recognition and citations. ( [Google Scholar](#))

SPOTLIGHT () ORAL ()  $\geq 100$  CITATIONS () BEST PAPER () BEST POSTER AWARD () PATENT ()  
BOOK CHAPTER () EQUAL CONTRIBUTION (\*) IMPACT FACTOR (I.F.) IMPACT SCORE (I.S.) RANK ()








H-INDEX	i10-Index	MAX CITATIONS	TOTAL CITATIONS							
10	10	451 [J <sub>5</sub> ]	1309	3	2	5	0	1	0	0

## Journal Proceedings







- J<sub>1</sub> – 2021 *IEEE* I.F. 3.9 (Q1) **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.
- J<sub>2</sub> – 2021 *Elsevier* I.F. 4.9 (Q1) M. A.-u. Golap, S.T.U. 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.
- J<sub>3</sub> – 2021 *Springer* I.S. 2.4 (Q2) S. M. A. Ullah, Md. Milon Islam, Saifuddin Mahmud, Sheikh Nooruddin, S.M. Taslim Uddin Raju, **Md. Rezwanul Haque**, “Scalable Tele-health Services to Combat Novel Coronavirus (COVID-19) Pandemic”, *SN Computer Science*, Springer Nature, vol. 2, no. 1, pp. 18, Jan. 2021.
- J<sub>4</sub> ★ 2021 *Springer* I.S. 2.4 (Q2) 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. 177, Mar. 2021.
- J<sub>5</sub> ★ 2020 *Springer* I.S. 2.4 (Q2) 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.
- J<sub>6</sub> ★ 2020 *Springer* I.S. 2.4 (Q2) Amanullah Asraf, Md. Zahirul 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.
- J<sub>7</sub> – 2025 *IEEE* I.F. 9.8 (Q1) 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”, *Expert Systems With Applications (Elsevier)*, 2026. [Under Review]

## Conference Proceedings

- C<sub>1</sub>  2026 *SMC*  **Md Rezwanul Haque**, Md. Milon Islam, and Fakhri Karray, “Towards Robust Reinforcement Learning for Small-Scale Language Model Agents”, *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, 2026. [Under Review]
- C<sub>2</sub> – 2026 *Photonics North* – M. F. A. Fattah, H. Abouali, S. Srikant, **Md Rezwanul Haque**, N. Barra, Fakhri Karray, J. Schertzer, M. Poudineh, and D. Ban, “Quantum Dot-Encoded Time Series Signals Decoded with Machine Learning Algorithms for Continuous Detection of Multiple Biomarkers”, *Photonics North*, Quebec City Convention Centre, Canada, 2026. [Abstract Accepted]

C <sub>3</sub>		2025	SMC		<b>Md Rezwanul Haque</b> , Md. Milon Islam, S M Taslim Uddin Raju, Hamdi Altaheri, Lobna Nassar, and Fakhri Karray, “ <i>MDD-Net: Multimodal Depression Detection through Mutual Transformer</i> ”, IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2025.
C <sub>4</sub>		2025	SMC		<b>Md Rezwanul Haque</b> , Md. Milon Islam, S M Taslim Uddin Raju, Hamdi Altaheri, Lobna Nassar, and Fakhri Karray, “ <i>MMFformer: Multimodal Fusion Transformer Network for Depression Detection</i> ”, IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2025.
C <sub>5</sub>	–	2025	IJCNN		S.T.U Raju, Md. Milon Islam, <b>Md Rezwanul Haque</b> , Hamdi Altaheri, and Fakhri Karray, “ <i>GNN-ViTCap: GNN-Enhanced Multiple Instance Learning with Vision Transformers for Whole Slide Image Classification and Captioning</i> ”, International Joint Conference on Neural Networks (IJCNN), 2025.
C <sub>6</sub>	–	2023	ATC		M. Rumi, B. Ullah, <b>Md. Rezwanul Haque</b> , Abdullah Al Noman, Emranul Haque, and Feroz Ahmed, “ <i>Smartphone Based BP Level Monitoring System Using DNN Model</i> ”, In 2023 International Conference on Advanced Technologies for Communications (ATC), pp. 12–18, 19-21 Oct. 2023.
C <sub>7</sub>	–	2023	ICCIT		M. Rumi, B. Ullah, <b>Md. Rezwanul Haque</b> , A.A. Noman, E. Haque, and Dr. Feroz Ahmed, “ <i>Body Weight Estimation Using Smartphone Based Photoplethysmography Signal</i> ”, 26 <sup>th</sup> International Conference on Computer and Information Technology (ICCIT), pp. 1-6, 13-15 Dec. 2023.
C <sub>8</sub>	–	2023	ICDAR		<b>Md Rezwanul Haque</b> et al., “ <i>BaDLAD: A Large Multi-Domain Bengali Document Layout Analysis Dataset</i> ”, ICDAR 2023: Document Analysis and Recognition - ICDAR, pp. 326–341, 19 Aug. 2023.
C <sub>9</sub>		2018	IC4ME2	–	<b>Md. Rezwanul Haque</b> , Md. Milon Islam, H. Iqbal, M.S. Reza, M. K. Hasan, “ <i>Performance Evaluation of Random Forests and Artificial Neural Networks for the Classification of Liver Disorder</i> ”, Proc. International Conference on Computer, Communication, Chemical, Material and Electronic Engineering (IC4ME2), IEEE, pp. 1-5, 8-9 Feb. 2018.
C <sub>10</sub>		2017	R10HTC	–	Md. Milon Islam, H. Iqbal, <b>Md. Rezwanul Haque</b> , M.S. Reza, M. K. Hasan, “ <i>Prediction of breast cancer using support vector machine and K-Nearest neighbors</i> ”, Proc. 2017 IEEE region 10 humanitarian technology conference (R10-HTC), IEEE, pp. 226–229, 21–23 December 2017.

## Workshop Proceedings

W <sub>1</sub>	–	2026	CVPR		MSR Shujon, MJH Jim, MH Islam, <b>Md Rezwanul Haque</b> , MR Islam, H Altaheri, Fakhri Karray, “ <i>CAST: Channel-Aware Spatial Transfer Learning with Pseudo-Image Radar for Sign Language Recognition</i> ”, Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2026.[ <a href="#">Accepted</a> ]
W <sub>2</sub>	–	2026	ACL		MSR Shujon, MJH Jim, MH Islam, <b>Md Rezwanul Haque</b> , Fakhri Karray, “ <i>The Blackwell Collective at StanceNakba Shared Task: PAST-TIDE: Prototype-Anchored Statement Tuning with Topic-Invariant Normalization for Stance Detection</i> ”, Proceedings of the 2nd International Workshop on Nakba Narratives as Language Resources, ACL Anthology, 2026. Accepted March 21, 2026.[ <a href="#">Accepted</a> ]
W <sub>3</sub>		2025	ICCV		<b>Md Rezwanul Haque*</b> , Md. Milon Islam*, S M Taslim Uddin Raju, Fakhri Karray, “ <i>A Signer-Invariant Conformer and Multi-Scale Fusion Transformer for Continuous Sign Language Recognition</i> ”, Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops, pp. 4931-4940, 2025. [ <a href="#">Media Coverage</a> ]
W <sub>4</sub>		2025	ICCV		Md. Milon Islam*, <b>Md Rezwanul Haque*</b> , S M Taslim Uddin Raju, Fakhri Karray, “ <i>FusionEnsemble-Net: An Attention-Based Ensemble of Spatiotemporal Networks for Multimodal Sign Language Recognition</i> ”, Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops, pp. 4924-4930, 2025.

## HONORS & AWARDS

---

Throughout my academic career, I have been consistently recognized with numerous scholarships and awards for excellence at the international, national, regional, and university levels, securing significant funding for my research and studies.

2025	Recipient	<i>Faculty of Engineering (FOE) Award (Spring)</i>	CAD \$1500	UW, CA
2025	Recipient	<i>Best Poster Award</i>	–	ICCV, USA
2025	Recipient	<i>Winner (2<sup>nd</sup>) of MSLR-2025 Challenge</i>	USD \$750	ICCV, USA
2025	Recipient	<i>Faculty of Engineering (FOE) Award (Winter)</i>	CAD \$1,500	UW, CA
2025	Recipient	<i>Graduate Student Contingency Bursary</i>	CAD \$5,000	UW, CA
2024–p.	Recipient	<i>Graduate Research Studentship (GRS)</i>	CAD \$18,000/yr.	UW, CA
2023	Recipient	<i>IICT Machine Learning Idea Scholarship</i>	BDT 20,000	KUET, BD
2019	Recipient	<i>KUET Undergrad Thesis Scholarship</i>	BDT 10,000	KUET, BD
2015–18	Recipient	<i>KUET Technical Scholarship</i>	BDT 32,000	KUET, BD
2015	Recipient	<i>Higher Secondary Excellence Result Award</i>	–	BD
2013	Recipient	<i>Secondary Excellence Result Award</i>	–	BD
2011	Recipient	<i>School Level Award from Fisheries Subdivision</i>	BDT 1,000	BD
2010–11	Recipient	<i>High School General Grade Scholarship</i>	BDT 5,100	BD
2007–09	Recipient	<i>Primary School General Grade Scholarship</i>	BDT 3,500	BD

## TECHNICAL PROFILE

---

2015–p.	Profile	<i>Stack Overflow</i>	2900+ Reputations	Q/A
2014–p.	Profile	<i>Codeforces</i>	350+ Problems Solved	Programming
2014–p.	Profile	<i>UVA Online Judge</i>	100+ Problems Solved	Programming
2019	Kaggle	<i>LANL Earthquake Prediction</i>	Top 16%	Data Science
2019	Kaggle	<i>Predict Future Sales</i>	Top 23%	Data Science
2018	Kaggle	<i>Toxic Comment Classification</i>	Top 32%	Data Science
2022	Course	<i>Quantum Machine Learning</i>	–	edX
2020	Course	<i>Deep Learning with Python and PyTorch</i>	–	edX
2018	Course	<i>Deep Learning Specialization</i>	–	Coursera
2017	Course	<i>Machine Learning</i>	–	Coursera

## SCIENTIFIC REVIEWING

---

2025–p.	Reviewer	<i>International Conference on Computer Vision (ICCV)</i>	I
2025–p.	Reviewer	<i>NeurIPS Workshop MusIML</i>	I
2025–p.	Reviewer	<i>International Conference on Electrical Information and Comm. Technology</i>	I
2025–p.	Reviewer	<i>International Conference on Systems, Man, and Cybernetics (SMC)</i>	I
2025–p.	Reviewer	<i>International Joint Conference on Neural Networks (IJCNN)</i>	I
2023–p.	Reviewer	<i>PLOS One: A peer-reviewed open access scientific journal</i>	II

## OTHER SERVICE

---

2025	Mentor	<i>Mentorship Program Fall 2025 (Grad Students)</i>	UW, CA
2018–19	Instructor	<i>Hardware Acceleration Club of KUET (HACK)</i>	KUET, BD
2015–19	Instructor	<i>Special Group Interested in Programming Contest (SGIPC)</i>	KUET, BD
2017	Volunteer	<i>University-Industry Collaboration: Challenges and Opportunities</i>	KUET, BD
2017	Volunteer	<i>3<sup>rd</sup> International Conference on Electrical Information and Communication Technology (EICT)</i>	KUET, BD
2015–17	Organizer	<i>National High School Programming Contest (NHSPC)</i>	KUET, BD
2014	Participant	<i>Regional Mathematical Olympiad 2014</i>	BD