Mohammad Raihanul Bashar

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Research Interests

Human-Computer Interaction • eXtended Reality (XR) • 3D User Interface • Human-Centered AI • Metaverse • Cognitive Science

Education

2024 – present **Ph.D.in Computer Science.**
Department of Computer Science & Software Engineering, Concordia University.
Supervisor: Dr. Anil Ufuk Batmaz

2023 **MSc in Computer Science**
Department of Computer Science & Software Engineering, Concordia University.
Fast-track to PhD
Supervisor: Dr. Anil Ufuk Batmaz

2013 – 2017 **BSc in Computer Science**
Department of Computer Science, Independent University, Bangladesh.
Effect of EMG Artifacts on Video Category Classification from EEG
Advisor: Prof. M. Ashraful Amin

Publications

Papers with future publication dates are accepted to appear in their respective venues.

Book Chapter

2017 [B. 1] Computational Intelligence for Pattern Recognition in EEG Signals. Aunnoy K Mutasim, Rayhan Sardar Tipu, **Mohammad Raihanul Bashar**, Md Kafiul Islam, M. Ashraful Amin. *Computational Intelligence for Pattern Recognition, Springer-Verlag.*

Peer-Reviewed Hybrid Conference-Journal Articles

2025 [J. 3] An Early Warning System Based on Visual Feedback for Light-Based Hand Tracking Failures in VR Head-Mounted Displays. **Mohammad Raihanul Bashar**, Anil Ufuk Batmaz. *In the special issue of the IEEE Transactions on Visualization and Computer Graphics, TVCG (IEEE VR' 25).*

Peer-Reviewed Journal Articles

2023 [J. 2] EEG-Based Preference Classification for Neuromarketing Application. Injamamul Haque Sourov, Faiyaz Alvi Ahmed, Md. Tawhid Islam Opu, Aunnoy K Mutasim, **M. Raihanul Bashar**, Rayhan Sardar Tipu, M Ashraful Amin, and Md Kafiul Islam. *Computational Intelligence and Neuroscience.*

2020 [J. 1] Use of spontaneous blinking for application in human authentication. Amir Jalilifard, Dehua Chen, Aunnoy K Mutasim, **M. Raihanul Bashar**, Rayhan Sardar Tipu, Md. Ahsan-Ul Kabir Shawon, Nazmus Sakib, M Ashraful Amin, and Md Kafiul Islam. *Engineering Science and Technology, an International Journal, Elsevier.*

Peer-Reviewed Conference Proceedings

2025 [C. 7] There Is More to Dwell Than Meets the Eye: Toward Better Gaze-Based Text Entry Systems With Multi-Threshold Dwell. Aunnoy K Mutasim, **Mohammad Raihanul Bashar**, Christof Lutteroth, Anil Ufuk Batmaz, Wolfgang Stuerzlinger. *In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI' 25).*

2024 [C. 6] Virtual Task Environments Factors Explored in 3D Selection Studies. **Mohammad Raihanul Bashar**, Anil Ufuk Batmaz. *Graphics Interface (ACM GI' 24).*

2018 [C. 5] Effect of Artefact Removal Techniques on EEG Signals for Video Category Classification. Aunnoy K Mutasim, **Mohammad Raihanul Bashar**, Rayhan Sardar Tipu, Md Kafiul Islam, M. Ashraful Amin. *24th International Conference on Pattern Recognition (ICPR' 18).*

2018 [C. 4] Effect of EMG Artifacts on Video Category Classification from EEG. **Mohammad Raihanul Bashar**, Rayhan Sardar Tipu, Aunnoy K Mutasim, M. Ashraful Amin. *Joint 2017 6th International Conference on Informatics, Electronics & Vision (ICIEV) & 1st International Conference on Imaging, Vision & Pattern Recognition (icIVPR).*

2017 [C. 3] Video Category Classification Using Wireless EEG. Aunnoy K Mutasim, Rayhan Sardar Tipu, **Mohammad Raihanul Bashar**, M. Ashraful Amin. *The 10th International Conference on Brain Informatics (BI' 17).*

2017 [C. 2] Implementation of Low Cost Stereo Humanoid Adaptive Vision for 3D positioning and Distance Measurement for Robotics Application with Self-calibration. Abul Al Arabi, Rayhan Sardar Tipu, **Mohammad Raihanul Bashar**, Binoy Barman, Shama Ali Monica, M. Ashraful Amin. *11th Asia Modelling Symposium, (AMS' 17).*

2017 [C. 1] 2D Surface Mapping for Mine Detection via Wireless Networking. **Mohammad Raihanul Bashar**, Abul Al Arabi, Rayhan Sardar Tipu, Md Tanvir Alam Sifat, Md Zobair Ibnalam, M. Ashraful Amin. *2nd International Conference on Control and Robotics Engineering (ICCRE' 17).*

Peer-Reviewed Conference Poster Abstracts

2025 [A. 1] Depth3DSketch: Freehand Sketching Out of Arm's Reach in Virtual Reality. **Mohammad Raihanul Bashar**, Mohammadreza Amini, Wolfgang Stuerzlinger, Mine Sarac, Ken Pfeuffer, Mayra Donaji Barrera Machuca, Anil Ufuk Batmaz. *In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI' 25).*

Peer-Reviewed Workshop Proceedings

2024 [W. 1] Subtask-Based Virtual Hand Visualization Method for Enhanced User Accuracy in Virtual Reality Environments. Laurent Voisard, Amal Hatira, **Mohammad Raihanul Bashar**, Mucahit Gemici, Mine Sarac, Marta Kersten-Oertel, Anil Ufuk Batmaz. *In IEEE VR Workshop on Novel Input Devices and Interaction Techniques (NIDIT' 24).*

Research Experience

2023 – present **EXiT Lab**, Concordia University, Graduate Student Researcher. Montreal, QC. Advisor: Dr. Anil Ufuk Batmaz. Driving research agenda on pushing the frontier of human interaction in eXtended Reality by developing interaction systems that empower human creativity. Publishing at top-tier HCI conferences.

2019 – 2021 **AGenCy Lab, IUB**, Independent University, Bangladesh, Research Assistant. Dhaka, BD. Advisor: Prof. M. Ashraful Amin. Develop a high-quality, standardized medicine image dataset with metadata, deploy a recognition model to enhance feature selection, and create a mobile application to assist visually impaired patients in identifying their prescribed pills. Work led to opensource code [O. 3].

2018 – 2019 **Computer Vision & Cybernetics, BD,** Independent University, Bangladesh, Research Assistant. Dhaka, BD. Advisor: Prof. M. Ashraful Amin. The goal was to compile a dataset of Bengali letters and numbers for Bangladeshi license plates and develop a custom ANPR system, successfully addressing the lack of open-source datasets and enabling accurate recognition of Bangladeshi license plates. Work led to opensource code [O. 2].

2016 – 2018 **Computer Vision & Cybernetics, BD,** Independent University, Bangladesh, Undergraduate Research Assistant. Dhaka, BD. Advisor: Prof. M. Ashraful Amin. With the vision of building a BCI-based video recommender system, we experimented with several state-of-the-art algorithms for each of the submodules (pre-processing, feature extraction, feature selection, and classification) of the Signal Processing module of a BCI system to find out what combination of algorithms best predicts what type of video a person is watching. Work led to publication at BI 2017 [C. 3], ICIEV 2017 [C. 4], ICPR 2018 [C. 5] and a Book Chapter [B. 1] and opensource code [O. 1].

Teaching Experience

2023 – present **Teaching Assistant**. Introduction to Game Developments, COMP 376. Undergraduate CS course, Concordia University. Responsibilities: Lead weekly tutorials, mark assignments, and organize final presentations.

2023 – present **Teaching Assistant**. Advanced Game Developments, COMP 6331. Graduate CS course, Concordia University. Responsibilities: Lead weekly tutorials, mark assignments, and organize final presentations.

Winter 2023 **Teaching Assistant**. Human-Computer Interaction, SOEN 6751. Graduate CS course, Concordia University. Responsibilities: Mark assignments and exams, design course projects, guide students on project development, and organize final presentations.

Fall 2018 **Teaching Assistant**. Image Processing & Pattern Recognition, CSE 420. Undergraduate CS course, Independent University, Bangladesh. Responsibilities: Lead weekly tutorials, mark assignments, and organize final presentations.

Fall 2018 **Teaching Assistant**. Data Mining and Warehouse, CSE 417. Graduate CS course, Independent University, Bangladesh. Responsibilities: Lead weekly tutorials, mark assignments, design course projects, and organize final presentations.

Industry Experience

Fall 2024 **Mitacs Accelerate Internship**, Research Intern. Remote. SonoNurse Inc., Concordia University, Montreal, QC.

2022 – 2023 **Senior Engineer, MLOps**. Quantigo AI, Dhaka, Bangladesh. Led the development and launch of two web applications, including a workforce management system, while providing customized ML-assisted data annotation solutions, developing an in-house video annotation platform, and establishing foundational architectures for current and future projects.

2021 – 2022 **Senior AI Engineer**. OPUS Technology Limited, Dhaka, Bangladesh. Developed an intelligent agent for CS:GO using offline RL, supervised the creation of an e-sports game prediction system, implemented a matchmaking system with AWS Gamelift, streamlined MLOps integration with cloud platforms, mentored the ML team on RL and clean coding practices, and maintained the companys largest project while contributing reusable modular-helper classes.

Summer 2021 **Machine Learning Engineer**. Expert Consortium Limited, Dhaka, Bangladesh. Developed an early shoplifting detection system.

2020 – 2021 **Software Engineer**. Maxis Systems Limited, Dhaka, Bangladesh. Integrated a DevOps pipeline as the development platform, developed scalable and maintainable microservice solutions, and built a platform for business analytics leveraging ML and Data Science.

Awards, Scholarships and Fellowships

2025 **Concordia Conference and Exposition Allowance**, School of Graduate Studies, Concordia University

2025 **Concordia Conference and Exposition Allowance**, School of Graduate Studies, Concordia University

2024 **Concordia Conference and Exposition Allowance**, School of Graduate Studies, Concordia University

2024 **FRS Scholarship for PhD Student, CAD 22,000/year**, Concordia University

2024 **Concordia International Tuition Award of Excellence, CAD 44,893**, Concordia University

2023 **FRS Scholarship for MSc Student, CAD 24,000/year**, Concordia University

2023 **Concordia Merit Scholarship, CAD 5,000**, Concordia University

2017 **SECS Award**, Independent University, Bangladesh

Service

Service items with future dates are confirmed commitments.

Organizing

2025 **Student Volunteer Chair**. ACM SUI 2025.
2025 **Student Volunteer**. IEEE VR 2025.

Reviewing

2025 **Reviewer**. The ACM Symposium on User Interface Software and Technology (UIST)
2025 **Reviewer**. IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
2025 **Reviewer**. The ACM Conference on Human Factors in Computing Systems Late-Breaking Work (CHI LBW)
2025 **Reviewer**. The IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)
2024 **Reviewer**. The ACM Conference on Human Factors in Computing Systems (CHI)

2024 **Reviewer**. The ACM Conference on Mobile Human-Computer Interaction (MobileHCI)

2024 **Reviewer**. The IEEE International Symposium on Mixed and Augmented Reality (ISMAR)

2024 **Reviewer**. The ACM Symposium on Spatial User Interaction (SUI)

Skills

I have expertise in developing interactive XR and AI systems, as well as full-stack web development, encompassing both frontend and backend. Additionally, I have experience in designing, training, and evaluating deep learning models. I am familiar with the following programming languages, frameworks, and research methodologies.

Programming Languages: Python, C++, C#, HTML/CSS/JavaScript

Frameworks: PyTorch, Scikit-Learn, Unity, Unreal, OpenXR, Flask, React

Research Methodologies: User Studies (quantitative/qualitative), DL experiments.

References

Available upon requests.