

Md Mustafizur Rahman

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Work Experience

March 2025 – May 2025

■ **Research Intern**, University of Trento, Italy Conducted research under Prof. **Mariolino De Cecco** and **Alessandro Luchetti, PhD** at MIROLab, focusing on Mixed Reality systems for rehabilitation. Developed a serious game on **Meta Quest 3** integrating a robotic walker, **Photon Fusion** networking, and **MQTT** for real-time robot communication. Built a path drawing system with avatar navigation, terrain-aware content placement, and gamified item collection, validated through therapist–patient co-location and robot integration.

March 2024 – Present

■ **Research Collaborator**, Kyoto University, Japan. Collaborating with Professors **Goshiro Yamamoto**, Chang Liu, and Hiroaki Ueshima from the Clinical Research Center for Medical Equipment Development on research titled "**Experience Augmentation in Physical Therapy by Simulating Patient-Specific Walking Motions.**" enhancing rehabilitation outcomes through advanced simulation techniques. Involved in multidisciplinary projects focused on optimizing rehabilitation practices in physical therapy settings. Additionally, I leverage AR, VR, and MR to create interactive tools that provide immersive learning experiences for physical therapists by simulating diverse impaired gait patterns.

October 2023 – Present

■ **Researcher | Master's Student**, Interactive Media Design Laboratory, Nara Institute of Science and Technology, Japan. Currently working on "**Experience Augmentation in Physical Therapy by Simulating Patient-Specific Walking Motions**" using the HumanML3D dataset. Supervised by **Professor Hirokazu Kato** and Assistant Professors Taishi Sawabe and Isidro Butaslac. Focused on enhancing physical therapy through immersive 3D simulations of individualized walking motions, utilizing AR, VR, MR, and generative AI techniques with LLMs like BERT to analyze and generate impaired human motion for therapeutic applications.

June 2022 – August 2023

■ **Team Lead - Software Quality Assurance Engineer at Talent Pro** • Led the QA efforts and managed testing processes for various projects at Talent-Pro. • Created and executed test plans, test cases, and designed automation test scripts. • Conducted test execution result analysis. • Specialized in Apium, Selenium WebDriver, TestNG, and Cucumber within Java-based automation frameworks (TDD, BDD). • Managed API testing, performance testing, security testing, and database testing using REST Assured and GraphQL.

Work Experience (continued)

- March 2023 – May 2023
- **Software Quality Assurance Engineer at RealEzy**, Singapore-based project under TalentPro • Hired by RealEzy, a leading Singapore real estate platform, for a dedicated QA role on their project. • Responsible for automating test processes, designing test plans, and ensuring software quality through manual and automated testing. • Worked extensively with Appium, Selenium, and Java-based automation frameworks to streamline testing efforts for RealEzy's platform. • Performed API, performance, and security testing using REST Assured, ensuring optimal functionality for the platform.
 - **Team Lead - Software Quality Assurance Engineer at Fanfare**, Bangladesh-based project under TalentPro • Assigned to Fanfare, a social commerce platform, to ensure quality in their software releases for three months. • Developed and executed test plans, test cases, and automated testing scripts to support the platform's quality assurance. • Utilized Appium, Selenium, and Java-based automation frameworks to optimize test cycles. • Conducted API and performance testing using REST Assured, ensuring smooth integration of new features and updates.



Education

- October 2023 – September 2025
- **Master of Engineering in Information Science at Nara Institute of Science and Technology, Japan**
Thesis title: *Experience Augmentation in Physical Therapy by Simulating Patient-Specific Walking Motions.*
CGPA: 3.54 out of 4.00
- January 2017 – December 2020
- **B.Sc. in Information and Communication Engineering at University of Rajshahi, Bangladesh**
Thesis title: *Virtual Reality Based Medical Training Simulator and Robotic Operation System.*
CGPA: 3.55 out of 4.00

Research and Project

- March 2025 – May 2025
- **Robotic Collaborative Walker with Impedance Control and Augmented Reality for Assisted Walking and User Empowerment**
Description: Built a mixed reality system on **Meta Quest 3** for therapist-guided gait training, integrating a robotic walker with **Photon Fusion** networking and **MQTT**. Features include path drawing, avatar feedback, and gamified terrain interaction. [\[Demo Video Link\]](#) [\[Accepted to IEEE MetroXRaine 2025\]](#)
- March 2024 – Present
- **Experience Augmentation in Physical Therapy by Simulating Patient-Specific Walking Motions**
Description: Designed a text-to-motion system for impaired gait generation using **HumanML3D**, combining classification and temporal VAE models. Implemented with **Python**, **Unity3D**, and **Blender API**. [\[Demo Video Link\]](#) [\[Published at APMAR2024\]](#)

Research and Project (continued)

December 2023 – Marach 2024	<div></div> <div>ARPoseTrainer: Real-Time Feedback for Motor Rehabilitation Using Augmented Reality</div> <div>Description: Built an AR system using Azure Kinect and HoloLens for real-time motion tracking and feedback. Used C# for skeletal analysis and Laravel + MySQL for score storage and web access to patient data. [Demo Video Link] [Project Git Link]</div>
January 2022 – December 2022	<div></div> <div>Virtual Reality Based Medical Training Simulator and Robotic Operation System</div> <div>Description: Developed a VR simulator for anatomy learning and remote surgery via a robotic system. Built with C#, C++, and Unity3D, integrating Photon Network, Firebase, and Arduino for real-time collaboration and robotic control. [DOI: 10.1109/ICRPSET57982.2022.10188546]</div>

Research Publications








Conference Proceedings

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M. M. Rahman, G. Yamamoto, C. Liu, I. Butaslac, T. Sawabe, and H. Kato, “Experience augmentation in physical therapy by simulating patient-specific walking motions,,” in *The 16th Asia-Pacific Workshop on Mixed and Augmented Reality (APMAR)*, 2024.
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M. M. Rahman, M. F. Ishmam, M. T. Hossain, and M. E. Haque, “Virtual reality based medical training simulator and robotic operation system,” in *2022 International Conference on Recent Progresses in Science, Engineering and Technology (ICRPSET)*, IEEE, 2022, pp. 1–4.

Skills




Languages	<div></div> Strong reading, writing and speaking competencies for English.
Coding	<div></div> Python, C#, Java, SQL, \LaTeX , C and C++
Machine Learning & Deep Learning	<div></div> Supervised and Unsupervised Learning, Neural Networks, CNNs, RNNs, Reinforcement Learning, Natural Language Processing, Model Optimization, and Evaluation.
Tools & Frameworks	<div></div> Unity3D Engine (AR/VR/MR), Arduino, Jira, Git, TensorFlow, PyTorch, Scikit-learn, Keras
Databases	<div></div> MySQL, PostgreSQL
Web Dev	<div></div> HTML, css, JavaScript, PHP, Laravel REST-API
Automation Testing Frameworks	<div></div> Selenium, Appium, Cucumber, TestNG/JUnit, Rest Assured API Testing, Postman, Performance Testing with Apache Jmeter

Miscellaneous Experience




Awards and Achievements

March-May, 2025	<div></div> Erasmus+ ICM , Erasmus International Credit Mobility (ICM) Exchange Programme at University of Trento, Italy.
2023-2025	<div></div> Monbukagakusho (MEXT) Scholarship , MEXT Scholarship Master’s student at NAIST, Japan.

Miscellaneous Experience (continued)

- 2023  **Tech Genius Awards**, Recognized for delivering the Best Performance as a Team Leader at TalentPro, Bangladesh.
- 2019  **1st Runner-Up at the IEEE RAS Hackathon**, BUET Winter School IEEE RAS Hackathon, Bangladesh.
-  **1st Runner-Up at the Robotics Exhibition and Competition**, LICT-JOB Fair Project Showcasing, Bangladesh.

TRAINING COURSES

- MAY - JUNE, 2019  **AR, VR, MR TECHNOLOGY COURSE**
Coursework: What is virtual reality (VR), Augmented reality (AR), and mixed reality (MR) technologies, devices, principles of operation, applications, and services in AR, VR, and MR systems. Practical display and use (Oculus Rift CV1/S, Oculus Quest, MS HoloLens, Samsung Gear VR, Google Cardboard, etc.)
- JANUARY-FEBRUARY, 2020  **SKILL DEVELOPMENT FOR ARDUINO & ROBOTICS**
Coursework: Arduino Basic to Pro, I2C, LCD, OLED, 7-Segment, Dot matrix display, DC, LDR and MQ-135 Gas sensor, RTC and PIR sensor, RFID reader, 4x4 Keypad and IR sensor, UART and GPS, GSM Module, PWM and Motor Driver, Humidity and Temperature sensor, Ultrasonic sensor, Node MCU, Wi-Fi.
- FEBRUARY – APRIL, 2019  **APRIL MOBILE GAME & APPLICATION COURSE**
Coursework: Effective and Creative Mobile Game Design, Production, and Delivery