Md Mustafizur Rahman

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Work Experience

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 TalentPro. • Created and executed test plans, test cases, and designed automation test scripts. • Conducted test execution result analysis. • Specialized in Appium, 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.

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.

Work Experience (continued)

March 2023 – May 2023

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 (M1 Result)

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 2024 – Present

Experience Augmentation in Physical Therapy by Simulating Patient-Specific Walking Motions
Description: We propose a novel system for physical therapy training using the HumanML3D dataset to enhance understanding of impaired gait patterns. Our approach combines a motion length classification model and a temporal variational autoencoder to generate diverse 3D motion sequences from textual descriptions. Using residual vector quantization and a Masked Transformer, the system ensures accurate motion generation for patient-specific simulations in mixed reality.
Developed in Python and C# with Unity3D, FastAPI, and the Blender Python API, the application is deployed on Meta Quest 3 for immersive rehabilitation training. **[Demo Video Link]**

December 2023 – Marach 2024

PoseTrainer: Augmented Reality Support System for Motor Rehabilitation
Description: The system leverages Augmented Reality (AR) for motor rehabilitation, providing real-time motion analysis and feedback. An Azure Kinect captures patient movements, processed in C# to generate skeletal tracking visualizations. This data is sent via UDP/IP to AR devices like the HoloLens, allowing real-time interaction and immediate feedback on pose accuracy and performance.
Development included C# for motion processing and a Laravel REST API in PHP with a MySQL database for storing scores and accessing personalized performance data through a web interface. **[Demo Video Link]** **[Project Git Link]**

Research and Project (continued)

January 2022 – December 2022

Virtual Reality Based Medical Training Simulator and Robotic Operation System
Description: This study introduces a virtual reality (VR) medical training simulator to enhance medical education. It allows students to explore anatomy, perform surgeries, and practice without real bodies. The system connects to a robotic platform, enabling remote surgeries by skilled surgeons, reducing travel needs for patients in remote areas. Development involved C# for the application and C++ for communication via Firebase, with Unity3D for UI design. Real-time video transmission and multi-user collaboration were facilitated by TCP/IP and Photon Network, while an Arduino Mega2560 controlled the robotic system through JSON commands. **[DOI: 10.1109/ICRPSET57982.2022.10188546]**

Research Publications

Conference Proceedings

1. 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	Strong reading, writing and speaking competencies for English.
Coding	Python, C#, Java, SQL, LaTeX, C and C++
Tools & Frameworks	Unity3D Engine (AR/VR/MR), Arduino, Jira, Git
Databases	MySQL, PostgreSQL
Web Dev	HTML, CSS, JavaScript, PHP, Laravel REST-API
Automation Testing Frameworks	Selenium, Appium, Cucumber, TestNG/JUnit, Rest Assured API Testing, Postman, Performance Testing with Apache Jmeter

Miscellaneous Experience

Awards and Achievements

March-May, 2025 — **Erasmus ICM (Nomination completed)**, Erasmus International Credit Mobility (ICM) Exchange Programme at University of Trento, Italy.

2023-2025 — **Monbukagakusho (MEXT) Scholarship**, MEXT Scholarship Master's student at NAIST, Japan.

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.

Miscellaneous Experience (continued)

- **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

References

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