Raihan Mia, PhD Candidate

Milwaukee, WI · mdraihan.mia@marquette.edu · +1-414-349-9605, Website · Google Scholar

Education

Marquette University — Milwaukee, WI
PhD Candidate in Computer Science — 2022 - Present
Advisors: Dr. Sheikh Iqbal Ahamed and Dr. Samuel Nemanich

Marquette University — Milwaukee, WI
MS in Computer Science — 2025

Bangladesh University of Engineering and Technology (BUET) — Dhaka, Bangladesh
BS in Computer Science and Engineering — 2019

Professional Experience

Graduate Research Assistant — Fall 2022 - Present
Marquette University, Milwaukee, WI
Affiliation: (i) Ubicomp Lab and (ii) Pediatric Movement & Neuroscience Lab

- Built a gamified mHealth system that integrate multimodal and multi-sensor interface with edge AI for motor skill learning and motor performance assessment.
- Deploy end-to-end scalable infrastructure for piloting and investigation: data collection, processing, quality control, experiment execution, and analytics across individuals with neurological and orthopedic conditions, i.e., cerebral palsy. The platform supports two NIH funded projects.
- Methods development for deep learning to decode motor control strategies and movement assessment, including SMT-Learner (*IEEE TNSRE*, under review).
- Built multimodal learning pipelines that synchronize iOS gameplay actions and brain signals, for motor imagery, action observation and movement execution
- Developing Aysyncronous Deep Coherence Neural Network for mobile brain-computer interfacing (mBCI) workflows iPad+Emotiv Flex 2 Wireless EEG for Real-time motor training and neurorecovery study.
- Learn more about my research work at motorlearning.games

2xResearch Intern — Summer 2025 & 2024
Ubitrix Inc, Milwaukee, WI (Start-up)

- Built HIPAA vulnerability detection for mHealth apps using fine-tuned LLMs; deployed on AWS g4dn GPUs.
- Implemented NIST 800-66r2 risk scoring pipeline integrating CVSS 4.0; generated compliance reports, reducing remediation cycles by 20+ days (ACM TOPS, Under review)
- Developed LLM-assisted malURLBox (integrated with Outlook as an extension) for malicious URL detection using dynamic behavior analysis and heuristic searching; deployed in VM sandbox; achieved 97.3% AUC.
- Integrate computation models, LLM inference, and research outcomes with commercial product, Ubicomply.ai that provides security and privacy compliance assessment solution for HIPAA, SOC 2, GDPR, and ISO 27001.

Data Engineer — 2020 - 2022
eSRD-Lab, Bangladesh University of Engineering and Technology

- Built the prototype of Bangladesh National Clinical Data Warehouse (NCDW): Hadoop/MapReduce, PostgreSQL, OLAP, ETL, and star-schema data marts.
- Integrated anonymized EHR and biomedical data from 220 healthcare sites into a scalable HPC data infrastructure.
- Developed online analytical modules and AI/ML pipelines to support research studies and experiments.
- Worked with clinical data standards and interoperability: LOINC, SNOMED CT, HL7, and OMOP.

Volunteer Research Collaborator (All of Us Research Workbench) — (Volunteer)
Medical College of Wisconsin (MCW), Milwaukee, WI

- Analyzed multimodal population data (EHR, surveys, and whole genome sequence data) for precision and personalized medicine.
- Focused on Southeastern Wisconsin populations, including Black American and Hispanic participants.

Junior Software Engineer — 2019 - 2020
Era InfoTech Ltd, Dhaka, Bangladesh

- Designed and analyzed software solutions for fintech.
- Built AI-based process automation solutions for Bank Asia.

Grant Writing Contributions

Awarded Grants

- NIH R21HD114094: Game-based Mobile-Health Quantification of Upper-Limb Motor Performance in Children with Hemiparetic Cerebral Palsy ($450K). PI: Dr. Nemanich; Co-I: Dr. Ahamed.
- NIH R42LM01435: A Framework for mHealth App Security and Privacy Analysis ($2.2M). PI: Dr. Ahamed.
- 2026 NMDSI Paving ROADS Seed Award: BrainTrain - Asynchronous Deep Coherence Neural Networks Integrated Mobile Brain-Computer System for Neurorehabilitation ($50K). PI: Dr. Ahamed.

Submitted Grants

- NIH R01: Neural Correlates of Motor Skill Learning in Children at Risk for Motor Delays. PI: Dr. Nemanich; Co-I: Dr. Ahamed.

Awards & Honors

- CSSRF Summer Fellowship 2023, Computer Science Department, Marquette University.
- Elsevier Smart Health Best Paper Award 2022 - "A privacy-preserving National Clinical Data Warehouse."
- NSF Travel Grant for IEEE/ACM CHASE Conference (2022).
- Best Innovative Project Award (2018), Senior Design Project at BUET.
- CITI Program Certificates for Human Subjects Research

Professional Service

- Program Committee Member: IEEE COMPSAC 2026, IEEE SERVICES 2023, IEEE COMPSAC 2023.
- Reviewer: Springer Soft Computing, Games for Health Journal, JMIR mHealth uHealth.
- Professional Memberships: ACM, IEEE, Pi Mu Epsilon, American Society of Neurorehabilitation (ASNR).

Technical Skills

Programming:	Python, MATLAB, R, C/C++, Rust, Swift, JavaScript (React, Angular)
ML & Runtime:	PyTorch, Transformers, TensorFlow, scikit-learn, OpenAI/HuggingFace
Infrastructure:	Linux, Git, CI/CD, AWS, GCP, CUDA, GPU inference, Spark, Hadoop
Data & Storage:	Databricks, S3, SQL/NoSQL, GraphDB, ETL, OLAP
Biomedical Informatics:	EHR/biomedical data integration, HL7, OMOP, LOINC, SNOMED CT
Specialized:	HPC, benchmarking, real-time processing, biosensors, mobile BCI

Publications

Peer-Reviewed Journal Articles

1. **Mia, M.R.**, Ahamed, S.I., and Nemanich, S. *A Deep Learning Framework for Assessing Pediatric Upper-limb Motor Control and Gamified Mobile Rehabilitation.* IEEE Transactions on Neural Systems and Rehabilitation Engineering. (under review, preprint).

2. Nemanich, S., Cassandra, K., **Mia, M.R.**, Ahamed, S.I., Bansal, N. *Diminished performance and learning of a novel visuomotor skill in children born preterm.* Developmental Psychobiology. (Accepted with minor revision)

3. **Mia, M.R.**, Rashid, M.B., Chowdhury, A., Barek, M.A., Zavin, S.R., Rahaman, M.A., Rahman, M.M., Riad, K.I., Shahriar, H., Ahamed, S.I. *HIPAA Regulatory Assessment and Scoring System for Healthcare Applications.* ACM Transactions on Privacy and Security (TOPS). (under review, preprint).

4. **Mia, M.R.**, Ahamed, S.I., Nemanich, S. *Gamified mHealth System for Evaluating Upper Limb Motor Performance in Children: Cross-Sectional Feasibility Study.* JMIR Serious Games. 2025;13:e57802. doi: 10.2196/57802.

5. **Mia, M.R.**, Kemmel-Bartletti, C., Ahamed, S.I., Nemanich, S. *Motor Skill Learning in School-Age Children Tested with a Gamified Mobile Health System.* Archives of Physical Medicine and Rehabilitation. 2025;106(5):e7–e8. https://doi.org/10.1016/j.apmr.2025.03.028.

6. **Mia, M.R.**, Ahamed, S.I., Fial, A., Nemanich, S. *A Scoping Review on Mobile Health Technology for Assessment and Intervention of Upper Limb Motor Function in Children with Motor Impairments.* Games for Health Journal. 2024;13(3):135–148. doi: 10.1089/g4h.2023.0224.

7. Aktar, S., Ahamad, M.M., Rabbani, M., Tian, S., **Mia, M.R.**, Tabassum, F., et al. *A Systematic Review on Eye as a Biomarker and an Application of Quantum Neural Network.* Cureus Journals. 2025;2(1). doi: 10.7759/s44389-025-03800-4.

8. Ahmmed, S., Mondal, M.R.H., **Mia, M.R.**, Adibuzzaman, M., Hoque, A.S.M.L., Ahamed, S.I. *A novel approach for standardizing clinical laboratory categorical test results using machine learning and string distance similarity.* Heliyon. 2023;9(11):e21523.

9. Thareja, S., Yang, X., **Mia, M.R.**, Upama, P.B., Torres, S.P., Coroft, L.J., et al. *441 Southeastern Wisconsin Community-Based Participatory Research using the All of Us Researcher Workbench.* Journal of Clinical and Translational Science. 2023;7(s1):131–131. https://doi.org/10.1017/cts.2023.469.

10. **Mia, M.R.**, Shahriar, H., Valero, M., Sakib, N., Saha, B., Barek, M.A., et al. *A comparative study on HIPAA technical safeguards assessment of android mHealth applications.* Smart Health. 2022;26:100349. doi: 10.1016/j.smhl.2022.100349.

11. **Mia, M.R.**, Hoque, A.S.M.L., Khan, S.I., & Ahamed, S.I. *A privacy-preserving national clinical data warehouse: Architecture and analysis.* Smart Health. 2022;23:100238. **(Best Paper Award)**.

Conference Proceedings / Abstracts

1. Alam, S., **Mia, M.R.**, Ahamed, S.I. *Quantum Sensing in Non-invasive Hemoglobin Measurement using NV Center in Diamond.* In 2026 Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) . (Accepted).

2. **Mia, M. R.**, Yu, K., Ahamed, S. I. *malURLBox: LLM-assisted malicious URL analysis for healthcare in a sandbox environment.* In IEEE/ACM conference on Connected Health: Applications, Systems and Engineering Technologies 2026. (Accepted)

3. Kemmel-Bartletti, C., Scheele, R., **Mia, M.R.**, Rifelj, A., Nemanich, S. *Influence of movement direction on upper-limb visuomotor control in children with unilateral cerebral palsy.* AACPDM 2026.

4. **Mia, M.R.**, Ahamed, S.I., Cassandra, K., Alam, S., Nemanich, S. *Self-Supervised Learning to Quantify Motor Control Strategies from Spatiotemporal Movement Trajectories in Young Children.* Annual Meeting of The American Society of Neurorehabilitation, April 23-25, 2025 Atlanta. (Presented).

5. Ashenhurst, L.T., Kemmel-Bartletti, C., **Mia, M.R.**, Nemanich, S.T., Battaglia, A., Smithberg, M. *Implementing a Novel Bimanual Visuomotor Game on an iPad to Assess Motor Skill Retention Among Children Born Term & Preterm.* American Journal of Occupational Therapy. 2025;79.

6. Rabbani, M., Alam, S., **Mia, M.R.**, Parida, A., Iqbal, I., Kolli, H., Sridevi, P., Alam, K.S., Upama, P.B., Khan, R.A., Ahamed, S.I. *Listening to the Brain: A Novel Approach to Understanding Cerebral Dynamics through Blood Flow Sounds.* IEEE COMPSAC 2024. doi: 10.1109/COMPSAC61105.2024.00131.

7. Riad, A.K.I., Barek, M.A., Rahman, M.M., Akter, M.S., Islam, T., Rahman, M.A., **Mia, M.R.**, Shahriar, H., Wu, F., Ahamed, S.I. *Enhancing HIPAA Compliance in AI-driven mHealth Devices Security and Privacy.* IEEE COMPSAC 2024. doi: 10.1109/COMPSAC61105.2024.00390.

8. Hoque, A.S.M.L., **Mia, M.R.**, Abdullah, M.S., Islam, M.J., Nath, B.C.D., Rahman, M.T., Ahamed, S.I. *BlockPRLS: Blockchain-Based Patient Record Linkage System for Big Data Analytics.* IEEE COMPSAC 2024. doi: 10.1109/COMPSAC61105.2024.00121.

9. Stasulas, C., **Mia, M.R.**, Ahamed, S.I., Nemanich, S. *Quantification of upper-limb movement using a mobile health iPad application in children with hemiparetic cerebral palsy.* AACPDM 2023. (Presented).

10. **Mia, M.R.**, Zahid, A.H., Nath, B.C.D., Hoque, A.S.M.L. *A Conceptual Design of Virtual Internship System to Benchmark Software Development Skills in a Blended Learning Environment.* IEEE ICCIT 2020. https://doi.org/10.1109/ICCIT51783.2020.9392670.

11. **Mia, M.R.**, Hoque, A.S.M.L. *Question bank similarity searching system (qb3s) using nlp and information retrieval technique.* IEEE ICASERT 2019. https://doi.org/10.1109/ICASERT.2019.8934449.