Shekh. Md. Saifur Rahman

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Research Interest

Robotics, Generative AI, Machine Learning, Computer Vision, Computer Graphics, IoT

Education

- **Military Institute of Science and Technology** *Jan 2020 - Mar 2024*
  B.SC. IN COMPUTER SCIENCE AND ENGINEERING Dhaka, Bangladesh
  - CGPA: 3.86/4.00
  - Thesis Title: PersiDani Fusion: Investigating Jamdani and Persian Motif Fusion through Image Processing, Transfer Learning, and GAN

Research Experience

- **Military Institute of Science and Technology (MIST)** *Mar 2023 – Present*
  Undergraduate Thesis | *Status:* ***Ongoing*** Dhaka, Bangladesh
  - Explored the fusion of traditional Jamdani and Persian motifs by applying image processing, transfer learning, and generative adversarial networks (GANs) to generate culturally rich textile patterns.
  - Developed a custom Persian motif dataset and utilized StyleGAN to synthesize novel designs, followed by a comparative analysis of generated motifs to assess aesthetic and cultural coherence, contributing to textile design and pattern synthesis.
  - The research has been submitted to *Neural Computing and Applications* for publication. [Thesis Details]

  Advisor: Nuzhat Tabassum

- **UIU Advanced Underwater Robotics & Automation (AURA) Crew, UIU** *Jan 2024 – Present*
  Mentor | *Status:* ***Ongoing*** Dhaka, Bangladesh
  - Mentoring the UIU AURA Crew in the development of advanced Remotely Operated Vehicles (ROVs) capable of performing complex underwater tasks beyond human limitations, focusing on robotic design, sensor integration, and control systems.
  - Guided **UIU MARINER**, the first Bangladeshi team to qualify for the **MATE ROV World Championship 2025** (USA), fostering innovation, system prototyping, and cross-disciplinary collaboration.

  Advisor: Dr. M. Rezwan Khan, Dr. A.K.M. Muzahidul Islam

- **United International University (UIU)** *April 2025 – Present*
  Research Collaborator – IoT Networking & Data Communication Repository | *Status:* ***Ongoing*** Dhaka, Bangladesh
  - Collaborating on the development of **NetIoT**, an open-source repository offering hands-on tutorials and real-world projects focused on IoT systems, networking, and data communication using Arduino, ESP32, and Raspberry Pi.
  - Contributed to modules on sensor integration, automation, GUI development, and remote communication to help learners build scalable IoT-based applications.

  Advisor: Mohammad Mamun Elahi

- **MIST Mars Rover Society, MIST** *Oct 2021 – Mar 2024*
  Co-lead – Software & Autonomous Navigation Team | *Member – Science Team* Dhaka, Bangladesh
  - Led the design and development of autonomous navigation systems, including path planning, obstacle avoidance, and localization for Mars rovers in simulation and real-world field tests.
  - Worked on the science module by integrating and calibrating various soil-testing sensors for environmental data collection and terrain analysis.
  - Participated in the **University Rover Challenge (URC)** and **Anatolian Rover Challenge (ARC)**, showcasing interdisciplinary robotics research.

Publications

J = Journal, C = Conference

Journal

[J.1] **Rahman, S.M.S.**, Fahmida, N.N., Khan, E.A., Zerin, S.N., Tabassum, N. and Sharmin, N., 2025. PersiDani Fusion: Investigating Jamdani and Persian Motif Fusion through Image Processing, Transfer Learning, and GAN. In *Neural Computing and Applications* (Manuscript submitted).

Conference

[C.1] Zerin, M., **Rahman, S.M.S.**, Fahmida, N.N., Zerin, S.N. and Islam, M.N., 2025, February. Evaluating and Developing Educational Gaming Applications to Raise Awareness of Child Sexual Abuse. In *2025 International Conference on Electrical, Computer and Communication Engineering (ECCE)* (pp. 1-6). IEEE.

[C.2] Bilwal, M., Tanvin, J.U., **Rahman, S.M.S.**, Faisal, M.R.F., Khan, A.F., Arafat, S.E. and Akhtaruzzaman, M., 2025. A Multi-Modal Assistive Robot Navigation System for Physically Impaired Users. In *2025 IEEE International Conference on Quantum Photonics, Artificial Intelligence, and Networking (ICQPAIN)* (Manuscript accepted for presentation).

Professional Experience

Oct 2024 - present	**Lecturer**, Department of Computer Science and Engineering United International University, Dhaka, Bangladesh
Feb 2025 - present	**Team Mentor**, UIU Advanced Underwater Robotics & Automation Crew United International University, Dhaka, Bangladesh
Apr 2024 - Oct 2024	**Lecturer**, Department of Computer Science and Engineering Military Institute of Science and Technology, Dhaka, Bangladesh
Jan 2023 – Feb 2023	**Software Engineer Intern,** IT Division Trust Bank PLC., Dhaka, Bangladesh

Teaching Experience

2025
CSE 2215/6: Data Structures and Algorithms - I, UIU, Bangladesh
Lecturer (∼90 students), *Spring*
CSE 2217/8: Data Structures and Algorithms - II, UIU, Bangladesh
Lecturer (∼25 Students), *Spring*
CSE 3811/2: Artificial Intelligence, UIU, Bangladesh
Lecturer (∼35 Students), *Spring*
CSE 2233: Theory of Computation, UIU, Bangladesh
Lecturer (∼50 Students), *Spring*

2024
CSE 2217/8: Data Structures and Algorithms - II, UIU, Bangladesh
Lecturer (∼35 Students), *Fall*
CSE 4325/6: Microprocessors and Microcontrollers, UIU, Bangladesh
Lecturer (∼20 Students), *Fall*
EEE 2113: Electrical Circuits, UIU, Bangladesh
Lecturer (∼95 Students), *Fall*
CSE 203/4: Data Structures and Algorithms - I, MIST, Bangladesh
Lecturer (∼60 Students), *Spring*

Certifications

Oct 2023 **Fundamental IT Engineer Examinations, ITEE** [Certificate]
Information Technology Promotion Agency, Japan (IPA)

Awards & Honors

2020 - 2024 **Commandant's List of Honour**
Military Institute of Science and Technology, Dhaka, Bangladesh
- Achieved a GPA of 3.80/4.00 or above in all four academic years

Dean's List of Honour
Military Institute of Science and Technology, Dhaka, Bangladesh [Certificate]
- Achieved a GPA of 3.70/4.00 or above in all four academic years

2023 **Champion in the Independence Day Programming Contest (IDPC) 2023**
Military Institute of Science and Technology, Dhaka, Bangladesh [Certificate]
5th in the Anatolian Rover Challenge 2023
Space Exploration Society(UKET), Turkiye [Certificate]
44th in the SUST Inter University Programming Contest (IUPC) 2023
Shahjalal University of Science and Technology, Sylhet, Bangladesh [Certificate]

2022 **2nd Runner-up in the Anatolian Rover Challenge 2022**
Space Exploration Society(UKET), Turkiye
43rd in the ICPC Asia Dhaka Regional Contest 2022
ICPC, Asia West Region – Dhaka Site [Certificate]

2021 **Champion in the University Rover Challenge (URC) 2021**
The Mars Society, USA [Certificate]

Extracurricular & Leadership Experience

Jul 2021 - Mar 2024	**Data Structures and Algorithms Instructor**, MIST Computer Club Military Institute of Science and Technology, Dhaka, Bangladesh
Feb 2023 - Mar 2024	**Vice President, Committee of R&D**, MIST Computer Club Military Institute of Science and Technology, Dhaka, Bangladesh
Oct 2021 - Mar 2024	**Software Team Member**, MIST Mars Rover Society Military Institute of Science and Technology, Dhaka, Bangladesh • Designed and implemented an autonomous navigation system for a Mars rover
Apr 2021 - Mar 2022	**Mentor, Technical team**, MIST Robotics Club Military Institute of Science and Technology, Dhaka, Bangladesh
Apr 2022 - Aug 2022	**Executive Director**, MIST Robotics Club Military Institute of Science and Technology, Dhaka, Bangladesh

Selected Projects

- **NextGen Wheelchair** *Sep 2022 - Jun 2023*
  Technology: *Machine Learning, Image Processing, Python, Arduino, JavaScript, IoT* [▶] [GitHub]
  - Engineered an IoT-enabled, multi-modal wheelchair system integrating real-time visual processing and sensor-based control for remote navigation, aimed at enhancing mobility for physically impaired users. The project focused on adaptive control logic and usability in constrained environments.
- **Heatmap Generation from Feet Pressure** *Dec 2022 - Feb 2023*
  Technology: *Python, Arduino, Pressure Sensors, IoT* [GitHub]
  - Designed a wearable IoT system using pressure sensors to capture plantar pressure distribution and generate dynamic heatmaps. The project aimed to support gait analysis and orthopedic assessment, with potential use in fall detection and rehabilitation monitoring.
- **Bangla Book Recommendation System** *Mar 2023 – Oct 2023*
  Technology: *Python, Pandas, NumPy, Scikit-learn*
  - Designed and implemented a collaborative filtering–based recommendation system tailored for Bangla literature readers, using anonymized user preference data. Explored user similarity metrics and evaluated system performance on a sparse dataset.
- **Educational Gaming for CSA Awareness *(Research Publication)*** *Mar 2023 – Feb 2025*
  Technology: *Usability Evaluation, Heuristic Evaluation, SUS* [📄]
  - Co-authored a research project accepted at ECCE 2025, involving the design and development of a Bengali storytelling game aimed at educating children about child sexual abuse (CSA) through interactive scenarios. Conducted heuristic evaluations and System Usability Scale (SUS) assessments to validate its effectiveness and usability.

Skills & Interests

Programming Languages: C/C++, Java, Python, PHP, JavaScript, SQL, HTML, CSS, Bash
Frameworks & Libraries: Django, Flask, React, .NET, Bootstrap, TensorFlow, Keras, PyTorch
Tools & Platforms: Linux, Git, MATLAB, Arduino IDE, Cisco Packet Tracer, Proteus
Hobbies: Playing Badminton, Carrom, and Table Tennis

References

Dr. Md. Mahbubur Rahman
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