Mahfuzur Rahman Emon

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SUST Profile | Portfolio | LinkedIn | Github | Google Scholar

EDUCATION

- **Shahjalal University of Science and Technology**   *Feb 2018 - Jan 2023*
  Bachelor of Science in Software Engineering   Sylhet, Bangladesh
  CGPA: 3.89/4.00

  ◦ Graduated with distinction, securing 2nd position in a class of 50

  ◦ Relevant coursework: Data Structures and Algorithms, Software Requirements Engineering, Software Architecture and Design Patterns, Software Verification and Validation, Data Science, Artificial Intelligence, Machine Learning

RESEARCH INTEREST

Software engineering automation, software maintenance, software architecture, empirical software engineering, human-centric development, and applications of AI/ML in software engineering.

RESEARCH EXPERIENCE

- **Undergraduate Research Supervisor**   *Mar 2024 - Present*
  Software Engineering, IICT, Shahjalal University of Science and Technology

  ◦ Supervising and have supervised 4 undergraduate research groups on diverse topics in software engineering and artificial intelligence.

  ◦ Advising students on idea development, literature review, research methodology, modeling techniques, and academic writing.

- **Research Assistant**   *Oct 2021 - Jan 2023*
  Bengali.AI 🔗

  ◦ Directed a team of 13 annotators in creating BaDLAD, the most extensive multi-domain Bengali Document Layout Analysis Dataset, featuring 33,700 document images and over 710,000 polygon-based annotations.

  ◦ Standardized annotation exports, conducted in-depth data analysis and visualizations, and optimized the dataset for machine learning compatibility and validation workflows.

PUBLICATION

1. MIH Shihab, MR Hassan, **M Rahman**, +14 authors. BaDLAD: A Large Multi-Domain Bengali Document Layout Analysis Dataset. In *International Conference on Document Analysis and Recognition (ICDAR)*, pages 326-341, August 2023. DOI: https://doi.org/10.1007/978-3-031-41676-7_19.

RESEARCH IN PROGRESS

- **Comparisons of Large Language Models for JavaScript Test Case Generation**   *Apr 2025 - Present*
  Ongoing

  ◦ Investigating the effectiveness of LLMs in generating Jest and Selenium test cases under different prompt conditions. The work involves dataset construction, prompt engineering, mutation testing, and coverage analysis with two undergraduate students.

- **Evaluating LLM-Generated Commit Messages with Code and Issue Context**   *May 2025 - Present*
  Ongoing

  ◦ Exploring how LLMs generate commit messages using code diffs and issue descriptions. The project includes dataset curation, prompt design, metric development, and validation with expert feedback, involving two undergraduate students.

- **Early Detection of Task Failures in Cloud Computing** *Jan 2025 - Jul 2025*
  Submitted for review (Vietnam Journal of Computer Science), under peer review

  ◦ Proposed and implemented a machine learning framework in collaboration with two undergraduate students to predict task failures in cloud computing using the Google Borg Cluster Trace dataset.

PROFESSIONAL EXPERIENCE

- **Lecturer - Software Engineering** *Nov 2023 - Present*
  Institute of Information and Communication Technology - Shahjalal University of Science and Technology Sylhet, Bangladesh

  ◦ Teaching a diverse range of courses including Software Verification and Validation, Software Architecture and Design Patterns, Algorithm Design and Analysis, and Introduction to Software Engineering.
  ◦ Mentoring students on their software engineering academic projects while also familiarizing them with industry-standard practices and techniques.
  ◦ Collaborating with students and colleagues on research initiatives.
  ◦ Conducted training on Python programming and basic data science for undergraduate students without a technical background under the EDGE project by the Government of Bangladesh.

- **Adjunct Faculty** *Jun 2023 - Present*
  Army Institute of Business Administration, Sylhet Sylhet, Bangladesh

  ◦ Teaching the "Computer and Its Application in Business" course, covering fundamental topics such as number systems, operating systems, cyber awareness, basic networking, and computer hardware/software. Conducting lab sessions on practical IT skills.

- **Assistant Software Engineer** *July 2023 - Nov 2023*
  Dynamic Solution Innovators Dhaka, Bangladesh
  Tools: [Typescript, ReactJS, JQuery, Java, Spring Boot, ActiveMQ, Redis, MongoDB]

  ◦ Worked on a large-scale Spring MVC project for managing campaign-driven offers, ads, and direct mail operations for the InfoReach application.
  ◦ Developed RESTful services using Spring Boot, Express.js, and Node.js to support advanced AJAX-based functionalities, and contributed to building a custom React.js editor for creating targeted email, SMS, and ad campaigns.

- **Junior Software Engineer** *Mar 2022 - Jun 2023*
  Dynamic Solution Innovators Dhaka, Bangladesh
  Tools: [Java, Spring Boot, OpenHIM, Docker, MongoDB, MySQL, JavaScript, ReactJS, fhir]

  ◦ Designed and implemented core elements of the Health Data Architecture (HDA) project, including a microservice bus powered by OpenHIM, to enable smooth data exchange and interoperability between healthcare systems, along with the patient portal.
  ◦ Contributed to the OpenCRVS platform by improving the Client Microservice (e.g., Record Audit, Work Queue, Configuration) and supporting development of the User-Management and API-Gateway microservices, including writing unit tests and performing code reviews.

- **Software Engineer Intern** *Sep 2021 - Feb 2022*
  Dynamic Solution Innovators Dhaka, Bangladesh
  Tools: [Typescript, ReactJS, GraphQL, Jest, MongoDB]

  ◦ Created a simple ToDo application and a mock E-Commerce website with mock API.
  ◦ Worked on OpenCRVS and performed bug fixes on a client microservice, contributed to the development of a component library, and implemented enhancements to the user profile and form-field generator features.

TECHNICAL SKILLS

- **AI Development Toolkit:** LLMs, Pandas, NumPy, Matplotlib, Scikit-learn, Jupyter Notebook
- **Languages:** JavaScript, Typescript, Java, C, C++, Python
- **Web Technologies:** ReactJS, Angular, HapiJS, NodeJS, GraphQL, Rest, Spring Boot, Redux, MongoDB, ActiveMQ, Redis, JQuery
- **Other Tools & Technologies:** Git, Docker, Github, Postman, fhir, OpenHIM, NGINX

PROJECTS

- **e-School**   *Apr 2019 - Jul 2019*

  Tools: [Javascript, ReactJS, Python, Django]   [○]

  The platform that enables students and teachers to work smarter and more efficiently.
  - Developed intuitive front-end interfaces for courses, classes, enrollment, and profile management to enhance the student user experience.
  - Implemented class management features for teachers, including student approval and grading, while overseeing overall UI consistency and quality.

- **Metal Slug**   *Apr 2019 - Jul 2019*

  Tools: [Java, libGDX, Box2D]   [○]

  A 2d shooting game
  - Developed the full core gameplay, including player controls, enemy behavior, collision detection, and game mechanics.
  - Integrated game elements using Java with libGDX and Box2D frameworks.

- **FileHub**   *Mar 2021 - Jun 2021*

  Tools: [Python, tkinter, Socket programming]   [○]

  A simple tcp file sharing system
  - Developed user-friendly GUI using the tkinter library, which provides an intuitive interface for users to interact with.
  - Implemented the file upload and connection functionalities.

HONORS AND AWARDS

- Codeforces Specialist | *Max Rating - 1427*   2020
- University Merit Stipend | *Shahajalal University of Science & Technology*   2020
- Ranked among the Top 5 teams in the "ITverse, Dhaka University" Hackathon Competition   2020
- National Higher Secondary School Merit Scholarship | *Government of Bangladesh*   2017
- National Secondary School Merit Scholarship | *Government of Bangladesh*   2017

VOLUNTEER EXPERIENCE

- **General Secretary**   *Feb 2022 - Feb 2023*

  SWE Society, SUST
  - Led SWE Technovent, a national tech event with 400+ participants; managed sponsors, logistics, judging panels, and event hosting.
  - Organized departmental Sports Week involving all student batches in various indoor and outdoor games.
  - Conducted programming and development bootcamps for junior batches.

- **Secretary of Science and Technology**   *June 2021 - Present*

  Grow For Future
  - Conducted programming and career guidance sessions for school and college students in rural areas.
  - Helped connect underprivileged students with resources and mentors to support continued education.
  - Built networks between established professionals and local students to foster inspiration and support.

REFERENCES

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