Ragib Shahariar Ayon

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Professional Summary

First-year PhD student in Computer Science with 3.5 years of backend engineering experience. My research focuses on AI and Software Engineering, particularly specification inference, LLM-based code generation, and software reliability.

Education

Ph.D. Student in Computer Science, Texas State University – San Marcos, TX — Spring 2025 – Present

B.Sc. in Electronics and Telecommunication Engineering (ETE), Rajshahi University of Engineering & Technology (RUET) – Rajshahi, Bangladesh — 2015 – 2022

Experience

Doctoral Instructional Assistant, Texas State University – San Marcos, TX — Jan 2025 – Present

- Supported teaching faculty through course preparation, assessment management, and addressing student questions during office hours and online communication.
- Assisted instruction in two graduate-level computer science courses: CS 5393, CS 5394, by proctoring exams, grading assignments, and providing academic support to students.

Doctoral Research Assistant, Texas State University – San Marcos, TX — May 2025 – Jun 2025

- Conducted research in AI and Software Engineering, focusing on LLM-based code synthesis, structured reasoning, and tool development.
- Designed and evaluated multi-agent LLM systems and curated datasets to support ongoing research in software specification and reliability.

Senior Software Engineer, BJIT Limited – Dhaka, Bangladesh — Apr 2021 – Dec 2024

Promoted from Trainee Software Engineer → Software Engineer → Senior Software Engineer

- Developed scalable backend and API services using microservices architecture, reducing system downtime by 80% and improving overall reliability.
- Designed and integrated secure blockchain components, including OAuth 2.0 authentication, Hyperledger-based services, and upgradeable ERC1155 smart contracts using the UUPS proxy pattern.

Publications

An investigation of machine learning algorithms and data augmentation techniques for diabetes diagnosis using class-imbalanced BRFSS dataset — Jun 2024

Mohammad Mihrab Chowdhury, **Ragib Shahariar Ayon**, Md Sakhawat Hossain

Healthcare Analytics, Volume 5, 2024. 10.1016/j.health.2023.100297

Brain Tumor Segmentation and Classification using Spatial Fuzzy C-means and Quadratic Support Vector Machine — Dec 2019

Ragib Shahariar Ayon, Jannatul Robaiat Mou, Sharafat Hossain Majed, Rathyatul Rifat

Proc. ICECTE, 2019, pp. 233–236. 10.1109/ICECTE48615.2019.9303511

A new approach of moving object detection using background subtraction method — Dec 2019

Rathyatul Rifat, Jannatul Robaiat Mou, **Ragib Shahariar Ayon**, Abid Ahsan

Proc. ICECTE, 2019, pp. 256–259. 10.1109/ICECTE48615.2019.9303552

Manuscripts Under Review

- **When Agents Fail: A Comprehensive Study of Bugs in LLM Agents with Automated Labeling** — Under review (research track) at ACM International Conference on the Foundations of Software Engineering (FSE) 2026.
- **AutoReSpec: A Framework for Generating Specifications using Large Language Models** — Under review (research track) at 3rd ACM international conference on AI Foundation Models and Software Engineering (FORGE 2026) in ICSE 2026.
- **From Discussion to Execution: Generating Buggy and Correct Executable Data-Science Code from Stack Overflow Posts** — Under review (research track) at 23rd International Mining Software Repositories Conference (MSR 2026) co-located with ICSE 2026.

Selected Projects

- **AutoReSpec** — An evaluation framework for LLM-based JML specification generation, featuring automated correctness checks, semantic comparison, and execution-based validation.
- **StackCodeGen** — A multi-agent LLM framework for generating and refining code patches using reasoning-traces, execution-feedback loops, and structured evaluation metrics.
- **Jasmy NFT Marketplace** — Developed scalable backend and API services for an enterprise NFT marketplace using NestJS, PostgreSQL, Redis, and AWS. Built a microservices-based API gateway, integrated OAuth 2.0 authentication, and implemented secure blockchain service interactions.
- **OpenPost NFT Marketplace** — Engineered a private blockchain network using Hyperledger Besu with IBFT 2.0 consensus, achieving 2× transaction throughput. Designed and deployed upgradeable ERC1155 smart contracts using OpenZeppelin and the UUPS proxy pattern.

Technical Skills

- **Programming Languages:** Python, JavaScript, TypeScript, Java, C, C++, Bash
- **LLM & Generative AI:** LangChain, Ollama, Hugging Face, multi-agent LLM orchestration
- **Machine Learning & Data Science:** PyTorch, TensorFlow, OpenCV, Matplotlib, Tableau, Power BI
- **Web & Backend Development:** Node.js, Express.js, NestJS, React
- **Blockchain:** Solidity, Ethereum, Hyperledger Besu, Hyperledger Fabric
- **Databases:** PostgreSQL, MySQL, MongoDB, Redis
- **Cloud & DevOps:** AWS, Docker, Git, CI/CD pipelines
- **Tools & Miscellaneous:** MATLAB, R, SPSS

Awards & Achievements

- **2nd Place**, TXST Open Datathon 2025
- **2nd Place**, Texas State University CTF Challenge 2025
- **4th Place**, Bobcat Innovation Challenge 2025

Service & Leadership

- Treasurer, RUET ETE Alumni Association 2022 – 2023
- Assistant Treasurer, RUET ETE Alumni Association 2021 – 2022

Professional Certifications

- **Professional Scrum Developer™ I (PSD I)** — Scrum.org 2024
- **Professional Scrum Master™ I (PSM I)** — Scrum.org 2022
- **AWS Certified Cloud Practitioner** — Amazon Web Services 2022
- **TensorFlow Developer Specialization** — DeepLearning.AI 2020
- **Deep Learning Specialization** — DeepLearning.AI 2020
- **Statistics with Python Specialization** — University of Michigan 2020