Mahdi Ali-Raihan

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EDUCATION

Columbia University **New York, NY**

B.S. Computer Science May 2025

Relevant Coursework: Artificial Intelligence, Natural Language Processing, Parallel Optimization for Robotics, Malware Analysis and Reverse Engineering, Cloud Computing, Computer Architecture, Embedded Systems, Operating Systems

Activities: Sunshine CTF (47th/641), Glacier CTF (37th/789), Columbia Hardware Hackathon

SKILLS

- Programming/Scripting Languages: C/C++, Rust, Go, Bash, Python, HTML/CSS/JS, TypeScript, Java, Kotlin
- Developer Tools/Software: UNIX/Linux, Git/GitHub, Visual Studio Code, Vim, Jenkins, Jira

EXPERIENCE

Department of Computer Science at Columbia University **New York, NY**

Teaching Assistant Sep. 2024 - May 2025

- Held weekly office hours for 300+ students in COMS W4701 Artificial Intelligence and 80+ students in COMS 4160 Computer Graphics
- Aided with grading and writing test scripts assignments and exams, answering students' questions on discussion board, and hosting review recitations

Emerging Leaders in Technology and Engineering **New York, NY**

Education Fellow Oct. 2021 - June 2024

- Lead a class of 20+ students each year teaching fundamentals of Python, and complementing it with different topics like hardware using a MicroBit as well as game development in Pygame
- Ensured that students are completing the projects assigned and clarified material through office hours
- Communicated with teachers and other fellows on how to improve students' experience

Ceros **New York, NY**

Quality Engineer Intern June 2022 - Aug. 2022

- Performed manual testing and ticketed issues using Jira and Google Doc that expedited the resolution of bugs and enhanced quality of Ceros' TextPlus tool
- Created end-to-end automated testing scripts using Webdriver IO, Cucumber, and TypeScript, which assisted Ceros in efficiently finding bugs in their TextPlus and Previewer tools
- Worked in a cross functional team setting with Software Engineers, UX/UI Designers, and Product Managers through agile meetings

TECHNICAL PROJECTS

Gnosis | *Python, TypeScript, AWS, MySQL, FastAPI, Flask, OpenAI, OpenAPI*

- Collaborated in developing a cloud-based AI-powered personal learning platform deployed on the cloud that enhances user engagement with reading materials by allowing uploads of PDFs, articles, and books
- Implemented a REST API that managed the resources for the Conversation microservice, such as creating or deleting conversations, adding replies, and fetching conversations
- Optimized the parameters for the response agent to provide engaging and intellectual conversations between the user and the agent

2v2 ESP32 Spaceteam | *C++. ESP32, WiFi, ESPNOW*

- Collaborated on the development of a competitive 2v2 team-based interactive game inspired by the Spaceteam mobile game
- Implemented the Room Screen UI and logic for the lobby navigation flow, allowing players to be placed in private rooms
- Handled communication logic between ESP32s with tasks including: join and leave requests, command exchange requests, win requests, etc.
- Synchronized communication between the ESP32s and drawing of the screen UI on the TTGO Display to minimize conflicts with shared resources and maximize efficiency of the program

Paxos-based Key Value Service | *Go*

- Implemented a functional Paxos consensus protocol in Go to handle distributed agreement among peers in fault-tolerant systems
- Developed a fault-tolerant key/value storage system using Paxos to ensure reliable replication and ordering of client operations across multiple servers
- Implemented robust RPC-based communication for client-server and server-server interactions, ensuring consistency and correctness in the presence of network failures and server crashes

Gmail Management | *Rust, Gmail API, Serde JSON, Command Line Argument Parser (CLAP), Lettre, Tokio*

- Developed a microservice for users to trash messages, query searches and receive related messages, and send messages with attachments in their Gmail client or send messages through a third party mail service
- Parallelized an asynchronous workload of trashing and querying email messages
- Provided users an option to input search query or sending mail through deserializing JSON formatted files