Mahdi Ali-Raihan

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EDUCATION

Columbia University **New York, NY**
B.S. Computer Science, 3.68 GPA Expected May 2025
Relevant Coursework: Data Structure & Algorithm, Advanced Systems Programming, Artificial Intelligence, Computer Architecture, Malware Analysis/Reverse Engineering, Fundamental Large Scaled Distributed Systems, Creative Embedded Systems, Cloud Computing
Activities: Sunshine CTF (47th/641), Glacier CTF (37th/789), Columbia Hardware Hackathon

SKILLS

- Programming/Scripting Languages: C/C++, Rust, Bash, Python, Go, 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 September 2024 - Present

- Hold office hours for 400+ students in COMS W4701 Artificial Intelligence and COMS 4160 Computer Graphics
- Aid with grading assignments and exams, answering students' questions on discussion board, and hosting review recitation sessions

Emerging Leaders in Technology and Engineering **New York, NY**
Education Fellow October 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 - August 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

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

Linker | *C, x86-64 Assembly, Linux, ELF*

- Created a simple linker that can link and perform multi-file resolution and relocation on an arbitrary number of object files generated from C or Assembly code
- The generated "a.out" file from the linker displays an appropriately filled out ELF file and can be executed

Debugger | *C, x86-64 Assembly, Linux, ptrace*

- Developed a debugger using ptrace library that operates similarly to GNU Debugger Project, allowing users to dynamically analyze and debug other executable programs
- Functionality includes: setting breakpoints, performing single or continuous steps, inspecting/editing memory addresses, and displaying a stack backtracing for errors on provided executable

Single-threaded and Multi-threaded Grep | *C, Linux, Multithreading*

- Implemented a single-threaded and multi-threaded version of the Linux grep command, which enables user to see all files and lines within the files containing a pattern string match from a provided directory
- Improved performance of grep by at least 50% using multithreading

TeXiT | *C, Bash, GTK4, Libadwaita, Blueprint Language for GTK interface, JSON-C*

- Simple UNIX-based text editor application with remote editing capabilities
- Developed file save functionality, tab features, GTK signal handlers for tab pages + file action buttons (e.g. new file, open file, save file), and serialization/deserialization of JSON strings for communication between server and clients
- Created installation shell script of TeXiT as a Desktop application