Alexander Paolini

561-617-6922 | alexander.paolini@outlook.com | linkedin.com/in/alexanderpaolini | github.com/alexanderpaolini | paolini.dev

Education

University of Central Florida, Burnett Honors College — Orlando, FL
Bachelor of Science in Computer Science — *Aug 2024 – May 2028*
University Associations: KnightHacks; Honors Congress; KnightRiders
Relevant Coursework: Data Structures and Algorithms; Discrete Structures; Programming with C; Programming with Java

Experience

Software Development Intern — Melbourne, FL
Better World Analytics — *May 2024 – Aug. 2024*
- Developed data processing scripts using Python and pandas to analyze call detail records and timing advance tables.
- Utilized Kepler.gl to analyze and visualize potential criminal paths, providing insights that could aid defense lawyers in preventing wrongful convictions.
- Collaborated with a team through weekly standup meetings, maintaining effective communication via email with coworkers and supervisors.

Math Instructor — Boca Raton, FL
Mathnasium — *Dec. 2022 – Aug. 2024*
- Guided 1-4 students at a time, primarily in Algebra II and Calculus, using the Socratic method to enhance critical thinking and problem-solving skills.
- Developed individualized learning strategies that significantly improved students' understanding of complex mathematical concepts.

Volunteer Developer — Remote
JPBBots — *2021 – 2023*
- Developed many different Discord bot applications including Censor Bot, a bot that would automatically delete inappropriate or disallowed words/phrases.
- Led the development of Censor Bot's filter, ensuring comprehensive coverage against inappropriate language, including handling lookalike characters and diacritics.
- Gained experience in proper development workflows using Git and Docker with TypeScript, contributing to a project utilized by over 100,000 communities and millions of users.

Projects

m | *Java, Recursive Descent Parsing, Abstract Syntax Tree, Interpreter*
- Developed a math-oriented interpreted programming language in Java – most notably supporting arbitrary precision numbers, functions, and lists.
- Developed a recursive descent parser to generate an Abstract Syntax Tree (AST) for efficient expression parsing, easily supporting operator precedence.
- Implemented a Tree Walk Interpreter to execute parsed statements dynamically.

ibssbi | *C, Binary/Bitwise Operations, Register-Based VM*
- Designed and implemented a custom register-based bytecode interpreter in C as a foundation for a future compiler.
- Supports execution of 37 OpCodes, including arithmetic operations, control flow, stack management, and system calls, with room for 64 total instructions.
- Implements a 64-register architecture with a dedicated stack and jump/call instructions for execution flow, using a compact 32-bit instruction format.
- Developed optimized bit manipulation macros for efficient instruction decoding.

ShareX Server | *JavaScript, redis, MongoDB, git, Mongoose*
- Developed a webserver that allowed users to upload screenshots automatically through **ShareX** or equivalent software.
- Built a frontend using Express.js and ejs to allow users to view and manage their uploaded files.
- Implemented a time-based cache on files using redis to temporarily save images on the host server, reducing overall requests to custom built file storage nodes.

Honors and Awards

UCF President's List — Fall 2024
12th place at the 38th Annual UCF High School Programming Tournament
UCF Provost Scholarship

Technical Skills

Programming Languages: Python, C++, C, Java, JavaScript, TypeScript
Libraries/Frameworks: numpy, pandas, Express.js, Next.JS, React
Tools/Platforms: Windows, Linux, MacOS, Git, GitHub, Raspberry Pi, Node.js, VSCode, kepler.gl, LaTeX