Rayhan Nazeel

Computing Science | University of Alberta

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PROFILE

Third-year Computing Science student focused on algorithms, systems, and ML. Comfortable in Python, C/C++, and RISC-V assembly. Built a CPU ray tracer (C) and an A pathfinding visualizer (RISC-V). Actively practice algorithmic problem solving on LeetCode. Seeking SWE/ML internships to contribute clean, efficient, and well-tested code.

EDUCATION

University of Alberta   09/2023 – Present
Computing Science
- Relevant Coursework: Artificial Intelligence, Machine Learning, Reinforcement Learning, Computer Architecture, File and Database Management, Data Structures & Algorithms
- Recipient of two $5,000 scholarships for academic excellence

PROJECTS

Ray Tracing Renderer (C)
University of Alberta – CMPUT 201 Project
- **Built a CPU-based ray tracer** that renders spheres with **lighting, shading, and anti-aliasing**.
- Implemented **vector math** and **ray-sphere intersection detection**, with **diffuse lighting** and shadows.
- **Structured code** into modular components for geometry, lighting, and color to improve maintainability.

A* Pathfinding Visualizer (RISC-V, GLIR)
Private Repository (available upon request)
- **Implemented** the **A*** search algorithm **entirely in RISC-V assembly** to compute optimal paths on a 2D grid.
- **Visualized pathfinding in real time** using the course-provided **GLIR graphics interface**.
- Optimized **heap-based open-list** and memory access patterns for efficient traversal and expansion.
- **Debugged and validated** the algorithm against multiple map test cases using terminal visualization tools.

SKILLS

Programming languages
Python, C, RISC-V
Assembly, Java, SQL

Data Science & ML
NumPy, Pandas,
Matplotlib, Deep Learning, Reinforcement Learning

Software Development
Object-Oriented
Programming (OOP), Data
Structures & Algorithms

Tools and Frameworks
Git, GitHub, Linux, VS Code, Android Studio, Firebase