HongFei Huang

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Skills

- Language/tool: **C/C++, Python, OpenGL, JAVA, Verilog, MATLAB, Git**
- Technique: **Computer Graphics, Linear Algebra, RTOS, Data Structure, Linux**

Projects

Real-Time Rigid Body Fracture Simulation (C++ | OpenGL | Computer Graphics)

Engineered an interactive **OpenGL** fracture simulation program that utilizes pre-fractured 3D models. Implemented a Surface Area Heuristic Bounding Volume Hierarchy (**SAH-BVH**) for efficient collision detection involving **Ray-AABB** and **AABB-AABB** intersections. Computed the collision between debris using conservation of **momentum** and gravity.

Ray-Tracing Engine (C++ | Ray-Tracing | Computer Graphics)

Developed a custom Ray-Tracing engine from scratch using C++, capable of rendering triangular mesh 3D scenes with 3 textures(**lambertian, metal, glass**). Incorporated recursive **ray-tracing** for handling reflections and refractions.

Real-Time Operating System on Keil Board (C | RTOS | Task Scheduling | Embedded Design[ARM])

Designed and implemented memory allocation with **binary tree**, adopted earliest-deadline-first(EDF) scheduler for task scheduling, the OS is capable of **context switching** in between tasks and handle user input through **UART** with **interrupt.**

Experience

Huawei -- Software Engineer (RTOS) (Sep 2023 - Dec 2023)

- Engineered a user-level program to validate kernel-level **priority boosting**, paving the way for its seamless integration into future Continuous Integration (CI) workflows.
- Leveraged Python with **NumPy** and **Matplotlib** to gather and analyze essential OS metrics produced by locks, threads, and processes, resulting in a **60%** acceleration in performance and power efficiency analysis.

OpenText -- R&D Software Developer (Jan 2023 - Apr 2023)

- Revitalized and enhanced source code profiling suites through independent research, employing JMeter and Intel Vtune for bottleneck identification via **call maps, stack, and heap** information.
- Developed a TypeScript Visual Studio Code extension compatible with the Eclipse LSP4J **Language Server** protocol, facilitating future CI/CD integration. The extension supports fundamental **IDE features** such as parse tree formation, auto-completion, and syntax highlighting.

OpenText -- Software Developer (Jan 2022 - Apr 2022)

- Managed the upgrade of all C++ dependency libraries/modules for newly released products on both Windows and **Linux** (RedHat7) platforms after performing a thorough compatibility check.
- Resolved **75%** of compatibility issues, sped up the validation process by **10%** against the deadline

Education

University of Waterloo (4-month co-op term) (Sep 2019 - Apr 2024)

- Candidate for Bachelor of Applied Science, Co-op **Computer Engineering** Student