SAMUEL STARK

Programmer

About

📍 Cambridge England

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in in/Samuel Stark

Experience

Arm Ltd
Summers 2019, 2021

Architecture Research Intern

Simulated impact of DVM operations and non-volatile memory in gem5 (C++, 'Ruby' DSL).

- Added DVM operations to existing gem5 CHI protocol model
- Simulated impact of DVM on many-core systems
- Presented results to key stakeholders and senior design members, including a 'CHI protocol crash course'
- Changes have been upstreamed to public gem5 repo (https://gem5-review.googlesource.com/c/public/gem5/+/57298)

Virtual Arts Ltd
09/2017 - 08/2018

Junior Programmer

Developed 3D game engine in C++/Vulkan/Metal with two senior engineers

- Implemented Physically Based Rendering with Image Based Lighting
- Ported Unity-based code, shaders to C++, GLSL and Metal
- Supported development of AR racing game (Lightstream Racer) in Unity/C#

Education

University of Cambridge
10/2021 - Present

Computer Architecture/Security
M.Phil, Distinction; PhD ongoing

University of Warwick
10/2018 - 07/2021

Computer Systems Engineering
B.Eng, First Class (85) - Best Overall Graduating Student

Projects

CHERI for RISC-V "V" - Masters Project
2021 - 2022

Applied CHERI-based memory protection to the RISC-V "V" vector extension.

- Researched RISC-V "V" extension and other scalable vector models in depth
- Designed combination CHERI and "V" specification, CHERI-RVV
- Implemented CHERI-RVV support in Clang
- Developed CHERI-RVV emulator in Rust

GPU Fluid Simulation/Visualization
2020 - 2021

Created a real-time GPU fluid simulation (CUDA) and parallel visualization (C++/Vulkan).

- Ported a fluid simulation from C to CUDA
- Implemented a GPU visualization in Vulkan
- Implemented various synchronization between CPUs and GPU
- Used memory sharing between CUDA and Vulkan to reduce copying

FPGA Image Processing
2021

Built high-performance image filter in SystemVerilog

- Designed highly performant image filtering kernels (3x3 convolution, 1x1 brightness/contrast)
- Implemented CPU-based real-time brightness adjustment using APB to communicate with the FPGA
- Developed a Python library for converting VGA signals to images for automatic testing

yk_gmd_io
2020 - Present

Import/export addon in Blender for the proprietary GMD file format from the Yakuza game series. (Python)

- Reverse-engineered parts of the file format with the community
- Designed algorithms to convert computer-friendly meshes to artist-friendly meshes
- Developed beginner-friendly user experience for new modders