



Bachelor/Master Thesis Project

Porting OpenCL® on GEMU: The AES Simulation Framework for GPUs

Description :

GPU simulators are often used by academic researchers while investigating new ideas and techniques for enhancing GPU hardware microarchitectures, improving GPU computing programming models and investigating novel GPU-like computing architectures. The recent introduction of the Vulkan API along with SPIR-V, an intermediate language for representing graphical shaders and compute kernels, promises cross-platform access, high-efficiency and better performance of graphics applications. However, none of the currently available GPU simulators support these new Khronos standards. The GEMU project here at the AES group, addresses this issue by developing a new fully fledged GPU simulation framework. GEMU provides a research platform for exploring GPU architectures with the latest Khronos APIs.

You will be required to:

- Contribute to the development of the GEMU simulator.
- Specifically, you will be responsible for implementing the OpenCL runtime environment and integrating it to the rest of the GEMU software stack.
- You will also be required to optimise & evaluate your implementation by running benchmark simulations.

Required Skills:

- Basic understanding of GPU microarchitectures.
- Hand on experience with OpenCL

Desirable Skills:

- Good C++ programming skills
- Driver development experience
- Vectorization optimisations using SIMD intrinsics
- Concurrent programming and multithreading

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