

FINAL PROJECTS IN GPU PROGRAMMING

Using OpenCL

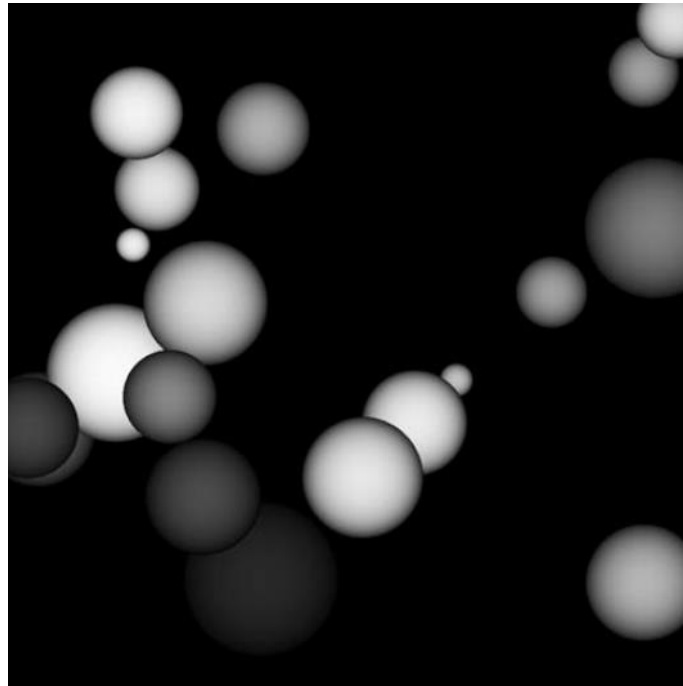
(1) Performance Optimization in OpenCL

- Examples:
 - ▣ Multiplication of large matrices, or sparse matrices.
 - ▣ Simple ray tracing.
- Tasks:
 - ▣ Performance profiling of the code using tools (VTune...etc.)
 - ▣ Performance optimization (local memory, size of workgroup, more efficient memory objects...etc.)
- Reports:
 - ▣ Description of the profiling and optimization techniques, analysis of the bottlenecks, references...etc.
- Limit of #Teams: 1

Simple Ray Tracing

- See an example (in CUDA, not OpenCL) at:
‘CUDA By Example’ Section 6.2

<https://developer.nvidia.com/content/cuda-example-introduction-general-purpose-gpu-programming-0>



(2) OpenCL Applications on Android

- Examples:
 - ▣ Image processing.
 - ▣ Feature detection (SIFT).
- Tasks:
 - ▣ Implementation on real Android devices (e.g., with Adreno GPUs)
 - ▣ Performance evaluation with and without OpenCL
- Reports:
 - ▣ Description of the implementation techniques and platform study, analysis of the performance...etc.
- Limit of #Teams: 1

Getting Started

- Installation of Android SDK and NDK
- Getting the SONY Mobile OpenCL example.
http://developer.sonymobile.com/knowledge-base/tutorials/android_tutorial/boost-the-performance-of-your-android-app-with-opencl/
- Trying out the above example and real devices with Qualcomm Adreno GPUs (e.g., SONY Z1 /Z2/ZL, Xiaomi 3, HTC M8, ...etc.)