

CS 179 Spring 2016

Project Information

You will be given four weeks to design and implement a GPU-accelerated project of your choice, working alone or in pairs. Teams of 3 must be approved by a TA and must be proposing a substantially-sized project. If you do choose to work with others, we will expect a proportional increase in the project's scope. In addition to turning in the code to compile a working executable at the end of the term, there are a few additional tasks we would like you to complete: a proposal, a CPU-based proof-of-concept, and a final write-up.

Due Dates

- Proposal: 11:59 PM, 5/12/16
- CPU Demo: 3 PM, 5/20/16
- Final Version & Write-Up: 3 PM, 6/3/16

Proposal

- 1-3 sentence summary of project
- 1-3 paragraph explanation of project with background
- Why is this challenging? Has it been done before? What tricky things are you going to have to figure out? 1-2 paragraphs
- What are the deliverables? Goals? 1 paragraph
- Week by week timeline: What are you going to do each week?

CPU Demo

Because debugging whatever algorithm(s) compose the core of your project on the GPU could be fairly difficult, we are asking you to provide a rough CPU-based proof-of-concept halfway through the project's allotted time. Any functionality that you plan to implement with a CUDA kernel should be written for the CPU, but feel free to use custom test-cases or make other simplifications. Once you have accomplished this, the remainder of your work will be translating existing code to the GPU, making your life easier.

Write-Up

Your final project should be submitted with comprehensive readme outlining everything we need to know about the program. This document should be clear and concise.

A sufficient readme should have all of the following:

- Installation/Usage instructions
- Explanation of what the program does
- Expected results
- Analysis of performance

Project ideas
Raytracer
Random numbers
16bit fast transpose
Diffeq solver
Finite automaton
Parallelize an algorithm. Work must be original.
Cryptocurrency
Multi machine computation
Matrix factorization
Branch and bound
Interval analysis

(see the powerpoint)

Resources

There will be in-class office hours on Friday during weeks 7, 8, and 9. These will be in addition to normal office hours. Please utilize these office hours for getting feedback and help with projects.

Have fun!