

2014.1 Multicore Computing
Project 3: CUDA Team Project
(Due : June 9th 11:59pm)

Step 1. make a team (deadline : 11:59pm, May 26th)

- team size : 1~5 members
- select a team leader
- only the team leader should submit group member list (name, studentID) and project title in eClass (if eClass is not working in your environment, you may also submit by emailing the professor.)

Step 2. Algorithm development that utilizes CUDA programming

- free topic : choose an algorithm where you can improve the performance using cuda
- example) image processing (e.g. gaussian filtering, (sobel) edge detection, image denoising, DCT encoding/decoding, ...), graphics (e.g. ray tracing, ...), matrix operation (e.g. matrix multiplication with shared memory optimization, ...), PI estimation (using Monte Carlo method)
- measure the performance of your CUDA implementation and single threaded CPU implementation.

Step 3. write a final report (ppt format preferred. doc/hwp/pdf is also OK) that includes

- project title, member list
- execution : describe (i) execution environment (OS type, CPU type, GPU type, memory size) (ii) how to compile, (iii) how to execute
- what is problem? (problem definition/specification)
- explain whether you used sample CUDA source code available in internet. If so, explain what source code you used.
- your group's contribution (describe exactly what your group actually did for this project)
- implementation issues (describe how you implemented)
- program demo (you may show movie file)
- experimental results : measuring the performance (execution time) of your CUDA implementation and your single threaded CPU implementation. show the performance results and screen capture of output results.
- conclusion : summarize your project result

Step 4. submission (deadline: 11:59pm, June 9th) – only team leader submits to eClass

- final report
- source code files
- executable file
- README.txt file (describe (i) execution environment (OS type, CPU type, GPU type, memory size) (ii) how to compile, (iii) how to execute)

Step 5. presentation (June 10th, 12th) : each team should give presentation.

Consideration

- You may use existing sample CUDA source codes available in internet. However, you must mention what source codes you used in the report. You should also clearly describe your group's contribution (describe exactly what your group actually did for this project)
- It is important to finish the project even if you choose easy and simple CUDA topic to gain good scores.