CS 6023 - GPU Programming
Project

08/08/2018

Why?

- Test parallelisation/CUDA programming ability in an **open-opened problem**

- Provide an opportunity for exploring a mini-research problem

- Provide an opportunity for writing code and making it available for the open source community

How

- Find partner, choose topic by 10 Oct

- Each project will be assigned at least one mentor

- All work to be checked into private Bitbucket accounts (to be set up by TAs)

- Mid-term presentation to class - last week of Oct

- Final report - just before End-sems

- Final viva - during/immediately after end-sems

- *Decide on whether you like to continue to work on project - for instance to expand on it and write a paper (not part of the course, not required, not graded)*

How - Grading

- Functionally correct implementation (25%) - by mentor
  - Produces correct result
- Performance optimisations (25%) - by mentor
  - Attempted different optimisations
  - Provides good speedup relative to serial code
- Mid-term presentation (10%) - by class
  - Conveyed the problem statement, identified bottlenecks/optimisations
- Final presentation + viva (10%) - by class
  - Conveyed results, answered questions, equal contribution amongst members, clarity
- Report (20%) - by instructor
  - Completeness, organisation, clarity, quality of writing
- Code quality (10%) - by mentor
  - Well documented, open-source readiness

What

1. Research the topic and understand the domain
2. Identify available serial code
3. Understand and execute serial code
4. Identify blocks which can be parallelised
5. Implement CUDA kernels and integrate with serial code
6. Profile implemented code and identify bottlenecks
7. Mid-term presentation
8. Perform optimisations on the implemented CUDA kernels
9. Possibly expand the scope of parallelisation / make tighter integration with serial code
10. Identify open directions and initial solutions
11. Write report, final presentation