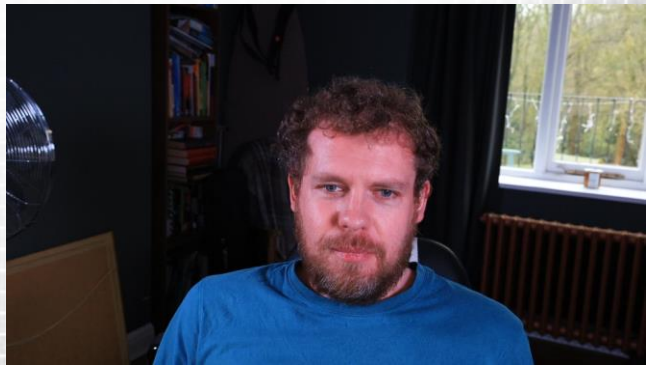
Parallel Computing with GPUs

Introduction Part 3 – Module Details

Dr Paul Richmond

http://paulrichmond.shef.ac.uk/teaching/COM4521/



COM4521/6521 specifics

- Designed to give insight into parallel computing
  - Specifically with GPU accelerators
  - Knowledge transfers to all many core architectures
- What you will learn (Learning Objectives)
  - Compare and contrast parallel computing architectures
  - Implement programs for GPUs and multicore architectures
  - Apply benchmarking and profiling to GPU programs to understand performance
  - Identify and address limiting factors and apply optimisation to improve code performance

Course Mailing List

- A google group for the course has been set up
  - You have already been added if you were registered 04/02/2021
  - If you have not had an email then you need to manually join
- Mailing list uses;
  - Request help outside of lab classes
  - Find out if a lecture has changed
  - Want to participate in discussion on course content
- https://groups.google.com/a/sheffield.ac.uk/forum/#!forum/com4521-group

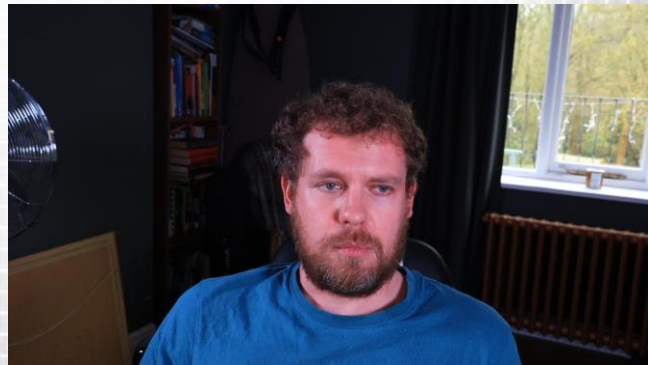
Module Delivery

- ~1.5 hours of Lectures available per week. Available in 10-15m recorded mini lectures.
  - Expected timetable for watching these on in the course website
- 2.0 hour online lab
  - Online Assessed MOLE quiz in Weeks 5 and 9 at 11:00-12:00 (10% each)
- Single assignment (80% of module mark)
  - Released week 4
  - Hand-in week 12
  - Use the lab classes to get feedback on your work!

Lab Classes

- 2 hours every week
  - Essential in understanding the course content!
  - Do not expect to complete all exercises within the 2 hours
- Labs are run by Coding help from lab demonstrators;
  - Dr Rob Chisholm (RSE Group)
  - John Charlton
  - Luis Rene Montana Gonzalez

Assignment and lab class help questions should be directed to the google discussion group



Machines Available

- Diamond Virtual Computer Lab 1 (lab reservation)
  - Access via myTimetable
  - NVIDIA GTX1050 GPU
- Diamond High Spec Lab (lab reservation)
  - Access via myTimetable
  - NVIDIA Quadro P4000
- Diamond High Spec Lab - Computer Room 4(https://www.sheffield.ac.uk/findapc/rdp/room/4/pcs) - This room can not be reserved but machines can be requested. These machines have slightly higher capability GPUs (Quadro P4000) but are limited in availability.
- Diamond High Spec Lab (no reservations)
  - Access via findapc
  - NVIDIA Quadro P4000
- Any other Diamond Computer Lab
  - Access via findapc
  - NVIDIA GTX1050 GPU
- Your own Machine: See Module Website

Learning Resources

- Course website: http://paulrichmond.shef.ac.uk/teaching/COM4521/
- Blackboard: Links for the online lab sessions
- Recommended Reading:
  - Edward Kandrot, Jason Sanders, "CUDA by Example: An Introduction to General-Purpose GPU Programming", Addison Wesley 2010.
  - Brian Kernighan, Dennis Ritchie, “The C Programming Language (2nd Edition)”, Prentice Hall 1988.