Heterogeneous Parallel Programming COMP4901D

Introduction

Course Description

- Introduces modern GPUs (Graphics Processing Units) as parallel computing platforms
  - GPUs were special-purpose graphics hardware.
  - CUDA treats them as general parallel processors.
- Teaches parallel programming on the GPU for general-purpose computing applications
  - GPUs were used mainly for gaming applications.
  - We write CUDA programs for various non-gaming computing tasks.

Time and Venue

- TuTh 9:00 - 10:20
- G009B, CYT Bldg
  - Subject to change
  - Auditing or sitting in welcome

Organization

- Lectures and Labs
  - Lecture topics
    - GPU architecture
    - CUDA programming model
    - Data-parallel algorithms
    - Performance optimizations
    - GPGPU case studies
  - Labs
    - Hands-on exercises under Windows

Workload & Assessment

- My proposal
  - 30% midterm, 30% assignment, 40% final exam
- Your suggestion?

Lab Facilities

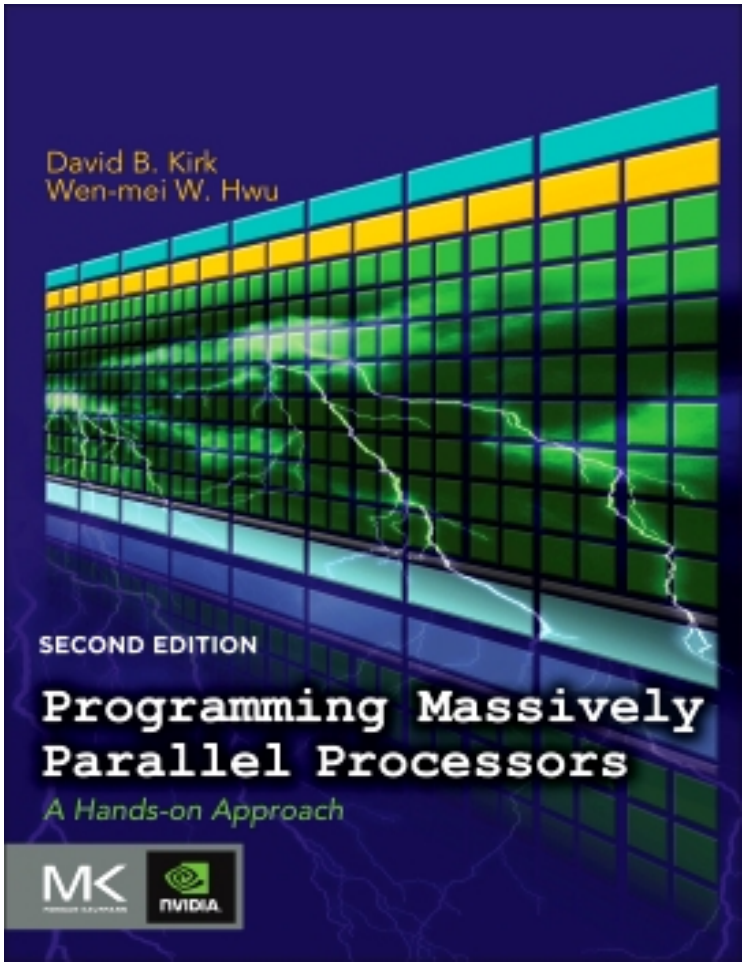
- Lab facilities
  - CSE Lab 4 (Room 4210)
    - CUDA-installed Windows machines
    - Available during our lab session as well as other times
  - Any CUDA-installed machines within your access
  - CUDA-installed cloud computing resources

Web Resources

- NVIDIA developer zone: http://developer.nvidia.com/
- GPGPU web site: http://gpgpu.org/
- Recent course on GPU programming:
  - Prof Wen-Mei Hwu of UIUC @ Coursera

  https://class.coursera.org/hetero-004

Reference Book



Programming Massively Parallel Processors:
A Hands-on Approach
2nd Edition
Author(s) : Kirk & Hwu
Release Date: 14 Dec 2012
Imprint: Morgan Kaufmann
Print Book ISBN : 9780124159921
eBook ISBN : 9780123914187
Pages: 514

About Me

- CSE Faculty
  - Database Systems
  - Parallel and Distributed Systems
  - Data Management for Scientific Computing
- Work on GPGPU
  - Relational Query Processing: http://www.cse.ust.hk/gpuqp/
  - MapReduce: http://www.cse.ust.hk/gpuqp/Mars.html
  - Genomics Computing: http://www.cse.ust.hk/gallop/
  - Data Mining: http://code.google.com/p/gpuminer/
  - Extended Precision: http://code.google.com/p/gpuprec/
  - Astronomic Data Processing: http://www.cse.ust.hk/starflow

Feedback from You

- Optional: Name, Program, Year, Contact
- Level of interest in the course
  - Will definitely drop/will definitely take/likely to take/likely to drop/not sure
- Programming background in C: OK/little
- GPUs you have access to: UNIX/Windows
- Enrollment status: enrolled/not enrolled
- Any other comments: workload, assessment, topics