Parallel Visual Computing
--
Introduction
Winter 2012/13

Ivo Ihrke, Tobias Ritschel, Mario Fritz
Coordinates

- Where: room 0.01, building E1.7
- When: Thursdays, 2-4pm

- Mailinglist: parallelvc@mpi-inf.mpg.de
  (not sure sending from outside is allowed)

- Webpage:
  http://www.mpi-inf.mpg.de/departments/d4/teaching/ws201213/gpu_computing

- Forum:
  http://parallelvc.freeforums.org
Coordinates

- Lecturers
  - Ivo Ihrke, office R.1.07 in E1.7 (MMCI)
  - Tobias Ritschel, office R 115F1, E1.4 (MPI)
    - Mondays and Thursdays
  - Mario Fritz, office R 629, E 1.4 (MPI)
Reminder

- If you have not done so already, please send
  - name
  - matriculation number
  - study program
  - email address

  to Ivo Ihrke (ihrke@mmci.uni-saarland.de)
Course Format

- Teams of two

- Two-week cycle
  - Lecture
  - Assignment
  - Discussion / Documentation of results / Improvement

- End of course: competition: pimp my code
  - Suggestions for slow programs welcome!
Evaluation

• 70% of grade: points for assignments
  • Each assignment 20 points
  • There will be more points than necessary, you can pick
  • Must be able to explain solution and optimization choices
  • Must demonstrate performance / accuracy

• 30% of grade: participation in discussion

• Competition will not be part of your grade
Competition

- In the spirit of sportsmanship
- Try to find the best solution
- Learn from each other
- Winner will receive a prize and honorable mention ;)}
Outline

Topics
- Single-instruction, multiple-data (SIMD) – Ivo
- Multi-core (CPU) – Mario
- Fine-grained parallelism (GPU) – Ivo
- Prefix scan, sorting, MIP maps (GPU) – Tobias
- GPU vision applications: Classifiers – Mario
- Advanced Screen Space Shading - Tobias
History and Background
Hardware and Software Requirements

Hardware

- CPU – at least dual core
- GPU – CUDA capable GPU (Nvidia)
Hardware and Software Requirements

Software

- Win:
  - Visual Studio 2010
  - Cygwin (need Visual Studio compiler for CUDA), other topics are ok with gcc

- Linux:
  - gcc

- Also need: nasm, CUDA, OpenGL, glut
Setting up your computer

- How_to_set_up.txt
The software framework

- Download from course webpage

- First assignment:
  - Get code compiled for your architecture
  - Optimize tut1b.cpp
Resources

- History

- Programming Platforms

- Program Profiling

For Visual Studio you need apparently a “Premium” edition for this feature

Ivo Ihrke, Tobias Ritschel, Mario Fritz / Winter 2012