Introduction to Parallel Computing and Parallel Algorithms
Einführung in das Parallelrechnen und parallele Algorithmen
ProSeminar 2013-2014

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Who am I?

• Biagio Cosenza, Ph.D.
  – Post Doctoral Researcher at the Distributed and Parallel Systems group
• Research interests
  – Compilers
  – Parallel Computing
  – High Performance Computing
  – Graphics and Visualization
• Contacts
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• Office
  – Room 3N04, 2nd floor, Computer Science building
• Office hours:
  – Wednesday 15.00-16.00
  – Appointment by email
What is this course about?

• An introduction to parallel computing
  – Understanding parallel hardware
  – Thinking parallel

• ...by example
  – Practical code examples
  – Parallel patterns

• ...in OpenCL
  – Parallel programming of GPUs, CPUs, APU
Course Organization

• ProSeminar
  – No written examination
  – Attendance is compulsory
  – Wednesday 14.15-15.00, room Rechnerraum 14

• Remarks
  – Slides and resources available in http://www.dps.uibk.ac.at/~cosenza/teaching.php
  – Please do exercise and participate actively in class!
Assessment

• Part 1
  – 3-4 individual projects

• Part 2
  – 1 group project with presentation

• Evaluation of the submissions
  – Correctness
  – Performance
  – Presentation (for group project)
Book

- Heterogeneous Computing with OpenCL
  - Benedict Gaster
  - Lee Howes
  - David R. Kaeli
  - Perhaad Mistry
  - Dana Schaa

- Available in the Bibliotek

- Not mandatory
Books

• Other books
  – OpenCL Programming Guide
    *Aaftab Munshi; Benedict R. Gaster; Timothy G. Mattson; James Fung; Dan Ginsburg*
    • This is a reference book
  – Programming Massively Parallel Processors: A Hands-on Approach
    *David B. Kirk, Wen-mei W. Hwu*
    • This book uses mainly NVIDIA CUDA, but concepts and algorithms apply to OpenCL as well
Today’s Work

• Analyze and understand basic OpenCL concepts
• Compile and run a simple OpenCL code
• Run on GPU and CPU devices

Install and try OpenCL also in your desktop or laptop.