Overview

JSC OpenACC Course 2017

Andreas Herten, Forschungszentrum Jülich, 16 October 2017

Jülich Supercomputing Centre

JÜLICH
FORSCHUNGSZENTRUM

- Forschungszentrum Jülich
- Part of Institute for Advanced Simulation (IAS)
- Operates supercomputers and connected infrastructure
- Researches in next-gen supercomputers
- Supports applications leveraging machines
- Supercomputers
  - JUQUEEN
  - JURECA
  - DEEP
  - JURON/JULIA
  - Former: JUROPA, JUGENE, JUDGE

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JURECA

- #80 in TOP500 list
- 1872 nodes (Intel Haswell CPUs, 2 $\times$ 12 cores)

$\hookrightarrow$ 75 nodes with 2 NVIDIA K80 GPUs
(each 2 $\times$ 2496 CUDA cores, 2 $\times$ 12 GB memory)

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OpenACC Course

JÜLICH FORSCHUNGSZENTRUM

- Since 2014
- There are other *many-core* courses
  - CUDA: 4.2018
  - OpenCL: 21.11.2017
- Interactive course – many hands-ons 👐

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- Since 2014
- There are other *many-core* courses
  - CUDA: 4.2018
  - OpenCL: 21.11.2017
- Interactive course – many hands-ons 👐
- Tutors of this course

Jiri Kraus

NVIDIA Application Lab at Jülich, NVIDIA

Anke Kreuzer

Division *Technology*, JSC

Andreas Herten

NVIDIA Application Lab at Jülich, JSC

Timetable

Session	Day 1	Day 2
M1	Introduction to GPU Programming *Andreas*	Performance Optimization *Jiri*
B	*Coffee Break (10:45 - 11:00)*	
M2	OpenACC Programming Model *Anke*	Interoperability of OpenACC *Andreas*
B	*Lunch Break (12:30 - 13:30)*	
A1	OpenACC Programming Model *Anke*	Multi-GPU Programming *Jiri*
B	*Coffee Break (15:00 - 15:30)*	
A2	Tools for Debugging & Profiling *Andreas*	Multi-GPU Programming *Jiri*

Organizationals

- Please sign Attendance List!
- Morning/afternoon breaks: Coffee machine around the corner and upstairs
- Lunch breaks: In canteen (*Casino*)
  - Need to buy payment cards on machine
  - Use machine with slot for entering cards, they provide Guest Cards!
  - 5 € deposit needed, returned when returning card on Tuesday
  - Participants from FZJ will surely help you!
- Interactive course!
  Lots of hands-on in different tasks!

More Technicalities

- Supercomputers for this course: **JURECA**
- Infrastructure for tasks
  - Each attendee has login: `train0XX` - `train0YY`
  - Password on whiteboard
  - Valid for local computer **and** JURECA

More Technicalities

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- Supercomputers for this course: **JURECA**
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  - Each attendee has login: `train0XX` - `train0YY`
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- Tasks
  - Tasks are in home directory of supercomputers → best to solely work on JURECA
  - Sorted by session
  - Solutions are always given, you decide how long you tinker before peaking into solutions
    (Hint: The later, the more benefit you will get from this course!)
  - There's a cheat sheet for the most important commands!

Let's Get Started!

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Questions?