Università della Svizzera italiana
Faculty of Informatics
Institute of Computational Science

Spring 2018 Software Atelier: Supercomputing and Simulations

Prof. Olaf Schenk

TA: Radim Janalik

February 21, 2018

Our courses in Spring semester

In Spring'2018 our group offers:

- Software Atelier: Supercomputing and Simulations - 6 ECTS
- CSCS-USI Summer School 2018 - Effective High Performance Computing, 3 ECTS
- Summer intern positions at USI or at CSCS - 0 ECTS, but some funding + coding fun

This presentation introduces the software atelier course for you to consider enrolling (for master students in CS it is obligatory).

Courses content

- ★ Simulation Project **transfer** (Feb-May, 4 months)
  - Work on individual task under staff guidance
  - Combat HPC experience
  - Presentations of all projects in class and project report).

successful completion of part ★ grants you 6 ECTs

Courses schedule

N	Task title	Timing
P1	Project plan	Feb 28th
P2	Presentation: Simulation Project	week 2
P3	Presentation: Simulation Project (status report)	week 5
P4	Individual project (regular meetings)	March-May
	Colloquium	End of May 2018

Courses format

- HPC simulation project team of 2-3 students (PDEs, Finite Elements, Scalability results)

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- Final HPC simulation project presentation (during exam period)

Passing Criteria and Grading

- 20 % project plan.
- 80 % simulation project.

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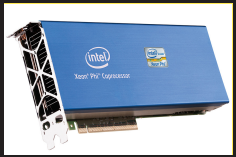
- 80 % simulation project.
  - 30 % project report.
  - 30 % project presentation.
  - 20 % own project creativity (scalability, extension of the project etc.)

Hardware access for training

For this course the following hardware resources will be available:

- ICS Cluster - 8 Xeon phi nodes, 8 GPU nodes, 24 multicore nodes
- CSCS Piz Daint Cluster - 5 320 hybrid (GPU) compute nodes and 1431 multicore compute nodes with peak performance 25 Peta flops



The Project Plan (by February 28, 13:30)

In this project, we would like to give you the freedom to explore a modeling and simulation problem that interests you.

- Sign up for a time with Olaf Schenk and group members to discuss the problem you'd like to model. It should be characterized by at least two of the following features: nonlinearity, scalability and complexity of the underlying software. We can also suggest problems based on your background and interests.

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  - questions you would like to answer through your simulation(s).

The Project Plan

- You should write a project plan (3 to 4 pages)
- Structure of the project plan:
  - Title page (Project title, Your name and email address, Date)
  - Introduction (motivation, goals)
  - Project tasks (activities required to meet the goal)
  - Work breakdown and project timeline (organization of the activities over the available time)

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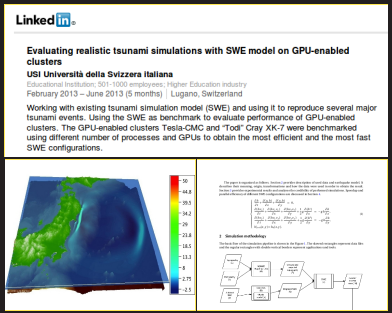
- References

Individual task (project)

- Why succeeding with project is important?
  - Project creates a solid line in your CV
  - Project report could become your first publication (technical report)
  - Project is a potential key to new connections, recommendations and offers
- Project is not a usual exercise:
  - It's a solution to a complex simulation problem
  - Project description will provide target and possible milestones to reach it
  - You can select one from our list or propose your own (must be in numerical simulation)



(PDC Lab '2013 project by Juraj Kardoš)

PASC18 conference

- What happens after the successful completion of the course?
  - You will present poster at PASC18 conference
    - July 2-4, 2018
    - Congress Center Basel
    - Basel, Switzerland
  - You will have your whitepaper published as USI technical report