Università della Svizzera italiana

Institute of Computational Science ICS

HPC Lab, Fall Semester 2020
Lecturer: Prof. O. Schenk
Assistants: A. Eftekhari, R. Janalik,
J. Kardoš, D. Pasadakis, T. Holt

Project 3
Present an Emerging Parallel Application or Algorithm
Final Due date: 16 December 2020 (4:30pm)

Examine an application problem for which parallel high performance computing has been used or an important algorithm which has been parallelized. You may pick a problem from research activities at USI or at CSCS (Switzerland), somewhere on the web, or elsewhere (so long as it is verifiable). Please build a group of two or 2 students from the HPC course and prepare slides for a 10 min to 15 min presentation in class. Please sign up on https://doodle.com/poll/5gi9rykhrdiw2k2g for a time slot for your presentation.

Some specific details to consider may include the following:

- What is the scientific problem being solved?
- If you pick up the parallelization of an important algorithm, describe both the complexity of the sequential and the parallel algorithm.
- How well did the application achieve its scientific objective? Are simulation results compared to physical results?
- What parallel platform has the application or the algorithm targeted? (distributed vs. shared memory, graphical processing units, vector, etc.). What tools were used to build the application or to implement the algorithm? (languages, libraries, etc.)
- If the application or the algorithm is run on a major supercomputer, where does that computer rank on the Top 500 list?
- How well did the application or the algorithm perform? How does this compare to the platform's best possible performance?
- Does the application or the algorithm scale to large problems on many processors? If you believe it has not, what bottlenecks may have limited its performance?

Not all of these details will be available for all applications or algorithms. You ought to explain what you find noteworthy about the application or its implementation.

Additional notes and submission details

Upload the slides of your presentation as a single pdf file to iCorsi system before the deadline.

- Your submission should be a gzipped tar archive, formatted like project_number_lastname_firstname.zip or project_number_lastname_firstname.tgz. It should contain:
  - all the source codes of your OpenMP solutions.
  - your write-up with your name project_number_lastname_firstname.pdf,
- Submit your .tgz through iCorsi .