

Distributed and Parallel Computing

Subject area: Computer Science/ICT

University: L'X
Level: MA1, MA2
Teaching mode: completely online, at specific time
Instructor(s): Patrick Carribault

Short description

With the advent of multicore/many-core processors, expressing parallelism is mandatory to enable high performance on different kinds of applications (scientific computing, big-data...). This course details multiple parallel programming paradigms to help exploiting such a large number of cores on different target architectures (regular CPUs and GPUs).

Full description

With the advent of multicore processors (and now many-core processors with several dozens of execution units), expressing parallelism is mandatory to enable high performance on different kinds of applications (scientific computing, big-data...). In this context, this course details multiple parallel programming paradigms to help exploiting such a large number of cores on different target architectures (regular CPUs and GPUs). It includes distributed-memory model (MPI), shared-memory model (OpenMP) and heterogeneous model (CUDA). All these approaches would allow leveraging the performance of different computers (from small servers to large supercomputers listed in Top500).

Learning outcomes

At the end of the course, the learner will be able to describe parallel programming, distributed algorithms, performance evaluation

General information

Contact hours per week: Per week : 2h of lecture and 2h of hands-on
Total workload: About 40 hours of lectures+hands-on. And approximately the same amount for individual work. (in student hours for the whole course)
ECTS credits: 5
Language: English

Course start date: 03 January 2023
Course end date: 17 March 2023
Add. info about start date:
Weekly teaching day/time: Wednesday afternoon
Time zone: CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)

Further information:

Prerequisites: Basic programming skills in C or C++ and basic knowledge of computer architectures
Activities and methods: Lectures, Lab-work
Presence on campus: no

Final examination

Form: Project with written report and oral defense
Date:
Location/format: online
Re-sit possibility: no
Transcript available: end of the semester and generally 8 weeks after the exam.
Add. info/requirements:

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places: 6
Minimum participants:
Internal course code: INF560
Contact: euroteq-mobility@polytechnique.fr

This course is part of the EuroTeQ Engineering University joint course catalogue 2023. This is a collaborative activity of the partner universities DTU, L'X, TU/e, TalTech, CTU, TUM as well as Technion. Students from these universities can participate in the offered courses. It is the responsibility of the student to check if you fulfil the requirements to participate in a specific course. Students are also advised to check with their home institution how to get recognition of the ECTS credits gained in courses of the EuroTeQ course catalogue. For further information about EuroTeQ Engineering University, visit www.euroteq.eu or get in touch with the above-mentioned point of contact.