K B S

# Parallel programming: Algorithms and tools

## Dates

**Lecture:** N. Maillard, M. Ritt

- TBD
- TBD

## Content

Parallel machine architectures. Parallel machine models analysis of parallel algorithms. Methodology of parallel software engineering. Design of parallel algorithms with examples. Tools for implementing parallel programming: message-passing libraries (MPI 2) and shared-memory programming with threads (POSIX, OpenMP).

## Goals

Students who have successfully finished this module have a good knowledge of different parallel architectures. They are capable to design and analyze parallel algorithms for different target architectures. They know how to implement them on different parallel architectures with state-of-the-art tools.

## Literature


- Foster, I.: Designing and building parallel programs, Addison-Wesley, 1995.
- Lea, D.: Concurrent programming in Java – Design principles and Patterns, Addison-Wesley, 1996.
- Snir, M. Otto, S., Huss-Lederman S., Walker D., Dongarra J.: MPI: The complete reference, Volume 1, The MPI Core, MIT Press, Boston, 1998.
- Snir, M. Otto, S., Huss-Lederman S., Walker D., Dongarra J.: MPI: The complete reference, Volume 2, The MPI-2 Extensions, MIT Press, Boston, 1998.
- Jaja, J.: An introduction to parallel algorithms, Addison-Wesley, 1992.
- Quinn, M.: Parallel programming in C with MPI and OpenMP, Mgraw-Hill, 2003.


More references will be given during the lecture.

## Material

Slides will be made available during the lecture.

## Exam

The preliminary date for a written exam is TBD. The final date and room will be announced in due time.

## Prerequisites:

Knowledge of sequential computer architectures, operating systems, and design and analysis of sequential algorithms. Experience in programming with C or C++.