

Part I

Organizational Matters

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- ▶ Modul: IN2011
- ▶ Name: “Parallel Algorithms”
“Parallele Algorithmen”
- ▶ ECTS: 8 Credit points
- ▶ Lectures:
 - ▶ 4 SWS
 - Tue 8:30–10:00 (Room 00.13.009A)
 - Thu 8:30–10:00 (Room 00.13.009A)
- ▶ Webpage: <http://www14.in.tum.de/lehre/2013WS/pa/>

- ▶ Required knowledge:
 - ▶ IN0001, IN0003
“Introduction to Informatics 1/2”
“Einführung in die Informatik 1/2”
 - ▶ IN0007
“Fundamentals of Algorithms and Data Structures”
“Grundlagen: Algorithmen und Datenstrukturen” (GAD)
 - ▶ IN0011
“Basic Theoretic Informatics”
“Einführung in die Theoretische Informatik” (THEO)
 - ▶ IN0015
“Discrete Structures”
“Diskrete Strukturen” (DS)
 - ▶ IN0018
“Discrete Probability Theory”
“Diskrete Wahrscheinlichkeitstheorie” (DWT)
 - ▶ IN2003
“Efficient Algorithms and Data Structures”
“Effiziente Algorithmen und Datenstrukturen”

The Lecturer

- ▶ Harald Räcké
- ▶ Email: raecke@in.tum.de
- ▶ Room: 03.09.044
- ▶ Office hours: (per appointment)

Tutorials

- ▶ Tutors:
 - ▶ Chris Pinkau
 - ▶ pinkau@in.tum.de
 - ▶ Room: 03.09.057
 - ▶ Office hours: Tue 13:00–14:00
- ▶ Room: 03.11.018
- ▶ Time: Fri 12:15–13:45

Assignment sheets

- ▶ In order to pass the module you need to pass a 3 hour exam





Assessment

- ▶ Assignment Sheets:
 - ▶ An assignment sheet is usually made available on Tuesday on the module webpage.
 - ▶ Solutions have to be handed in in the following week before the lecture on Tuesday.
 - ▶ You can hand in your solutions by putting them in the right folder in front of room 03.09.052.
 - ▶ Solutions will be discussed in the subsequent tutorial on Friday.

1 Contents

- ▶ PRAM algorithms
 - ▶ Parallel Models
 - ▶ PRAM Model
 - ▶ Basic PRAM Algorithms
 - ▶ Sorting
 - ▶ Lower Bounds
- ▶ Networks of Workstations
 - ▶ Offline Permutation Routing on the Mesh
 - ▶ Oblivious Routing in the Butterfly
 - ▶ Greedy Routing
 - ▶ Sorting on the Mesh
 - ▶ ASCEND/DESCEND Programs
 - ▶ Embeddings between Networks

2 Literatur

-  Tom Leighton:
*Introduction to Parallel Algorithms and Architecture:
Arrays, Trees, Hypercubes,*
Morgan Kaufmann: San Mateo, CA, 1992
-  Joseph JaJa:
An Introduction to Parallel Algorithms,
Addison-Wesley: Reading, MA, 1997
-  Jeffrey D. Ullman:
Computational Aspects of VLSI,
Computer Science Press: Rockville, USA, 1984
-  Selim G. Akl.:
The Design and Analysis of Parallel Algorithms,
Prentice Hall: Englewood Cliffs, NJ, 1989