Presentation of the MPRI courses on Algorithms and Complexity

2018
2-24-2 Solving Optimization Problems with Search Heuristics

- Carola Doerr and Christoph Dürr
- theoretical guarantees for widely applied search heuristics
- examples: local search, simulated annealing, evolutionary algorithms
2-24-1 Optimization

- Sypros Angelopoulos and Evripidis Bampis
- mainly deterministic approximation algorithms for combinatorial optimization problems
- explore use of primal dual framework for design and analysis

example: analyse greedy algorithm and approximation schemes for the load balancing problem

maximum load
2-34-1 Quantum information and applications

- Sophie Laplante and André Chailloux

- how do important concepts in theoretical computer science change on a quantum computer?

- Basic introduction, Algorithms, Quantum crypto attacks, Communication complexity
Quantum Cryptography

- Anthony Leverrier and Elham Kashefi
- Quantum information and error correction
- Using quantum resources for designing unconditional secure cryptosystems

A quantum error correcting code
2-18-1 Distributed Algorithms for Networks

- Pierre Fraigniaud and Adrian Kosowski and Benjamin Doerr

- Design and analysis of local distributed algorithms

- model for the spatiality constraint, model for limited between neighbors, compact routing schemes, gossip protocols.

(Δ+1)-coloring reduces to finding a maximum independent set