Heuristic Search Methodologies, 8.0 credits

Heuristiska sökmetoder, 8.0 hp

Third-cycle education course

MAI0083

Dept of Mathematics

Valid from: First half-year 2023

Approved by
Head of Department

Approved

Registration number

Entry requirements

Undergraduate courses in mathematics, optimization and computer science.

Contents

- Common concepts for metaheuristics: optimization models and methods, representation, objective function, constraint handling, performance analysis.
- Single-solution based metaheuristics: fitness landscapes, local search, simulated annealing, tabu search, variable neighbourhood search.
- Population-based metaheuristics: evolutionary algorithms, swarm intelligence.
- Metaheuristics for multiobjective optimization: multiobjective optimization, fitness assignment strategies, performance evaluation and Pareto front structure.
- Hybrid metaheuristics: combining metaheuristics with mathematical programming, constraint programming, machine learning and data mining. Parallel design of metaheuristics.

Educational methods

Seminars where the participants present the course topics and solutions to selected exercises from the book. Implementation projects on applications of metaheuristics.

Examination

Active participation with presentation of course topics, solutions to exercises and results of projects.

Grading

One-grade scale

Course literature

Metaheuristics: from design to implementation, E.-G. Talbi, Wiley, 2009.