

Optimisation techniques

Credits: 5 Semester 2 Compulsory: No

Format	Lectures 24 h	Tutorials / Projects 16	Private study 68 h
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Lecturer: F. Bennis (ECN), W. Ogryczak (WUT), C. Nattero (UNIGE)

Objectives: The lecture presents different theoretical and computational aspects of a wide range of optimization methods for solving a variety of problems in engineering and robotics.

Contents:

- Basic concepts of optimization,
- Gradient based methods,
- Evolutionary algorithms,
- Multi objective optimization methods,
- Robust optimization methods,
- Inverse problem,
- Multidisciplinary optimization problems,
- Programming aspects,

Practical Work: exercises on design and motion planning robotics problem.

Abilities: The students will be able to:

- Understand different theoretical and computational aspects of a wide range of optimization methods,
- Realize the possibilities offered by the different optimization methods,
- Use of optimization toolbox.

Assessment: 30% continuous assessment, 70% from end of semester examination.

Recommended texts:

R. Fletche, *Foundation of structural optimization*. A unified Approach, John Wiley & Sons, 1987.

Further readings: will be provided by lecturer