

Numerical Optimization

(Prof. Lorenzo Mascotto)

Academic year 2023-24

Aims

The aim of the course is to introduce several optimization problems both from a more analytical side and a numerical/algorithmic perspective.

Contents

- Theory of convex sets and functions
- Unconstrained minimization problems
- Constrained minimization problems

Detailed program

- Theory of convex sets and functions: basic definitions and properties; relations with local extrema
- Unconstrained minimization problems: basic setting; sufficient conditions for existence of minima; characterization of local minimaLine search methods
- Trust region methods
- Constrained minimization problems: active sets; feasible directions; characterization of constrained minima
- Karush-Kuhn-Tucker conditions
- Linear programming

Prerequisites

Basic knowledge of mathematical analysis and linear algebra

Teaching form

Usual lecture room teaching.

Textbook and teaching resource

- Teacher's notes available on demand
- Book "Numerical Optimization" by J. Nocedal and S. Wright

Semester

2nd Semester.

Assessment method

The exam consists in:

- reading and understanding some assigned parts of the book "Numerical Optimization" by J. Nocedal and S. Wright not covered during the course;

- prepare beamer slides on that topic (duration = 1/2 hour)
- present the slides in front of the Professor and possible the other students of the course

Office hours

Email appointment