Computational Techniques in Modern Optimization: From Interior Point Methods to Big Data

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Timetable: 12 hrs. First lecture on May 20, 2018, 10:30 (dates already fixed, see calendar). Torre Archimede, Room 1C/150.

Course requirements:

Examination and grading: Pass by attendance.

SSD: MAT08, MAT09

Aim: This course will familiarize the students with recent progresses in computational optimization and will introduce several relevant applications of optimization in finance, data science and engineering.

Course contents: This course will address practical methods of modern optimization and their applications. It will cover (briefly) interior point methods for linear, quadratic and nonlinear programming including the aspects of their efficient implementation. The success of the latter is based on the ability to cleverly exploit sparse matrix techniques in the linear algebra operations. Several applications of optimization algorithms in data science will be discussed: the Markowitz mean-variance portfolio optimization problem, classification problems arising in statistics and machine learning, inverse problems in statistics and signal and image processing, truss layout optimization problems in civil engineering.