Recent advances in numerical algorithms for convex optimization

PhD course, KTH, ACCESS intensive course
May 16-19, 2016, 3 ECTS

Lecturer: Radu Ioan Bot
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University of Vienna

Course overview: The aim of the lecture series is to present the state-of-the-art in the field of numerical algorithms for convex optimization. We will start by presenting some fundamental elements of convex analysis, we will go through standard numerical methods for convex optimization problems and will close with an overview of the latest developments in this field. A particular emphasis will be put on the role of the splitting paradigm in the framework of solving nonsmooth convex optimization problems with complex structures. The theoretical considerations will be illustrated by numerical experiments in the context of solving problems arising in real-life applications.

Structure The PhD course consists of four lectures by Radu Bot. We will also have an two-hour workshop that allows for discussions around implementations of the methods from the course as well as the exercises. If the student successfully completes the exercises in time the course is worth 3 ETCS.

Basic knowledge in optimization, convex analysis, and functional analysis is expected (duality, projections, Hilbert spaces, etc.). To fully appreciate the course, good knowledge in optimization is required (e.g., Luenberger: Optimization be vector space methods).

Course Schedule: All seminars are given at KTH Department of Mathematics, Lindstedtsvägen 25.

- Lecture 1: Monday 16.15-18.00. Room 3418 (May 16)
- Lecture 2: Tuesday 10.15-12.00. Room 3418 (May 17)
- Lecture 3: Tuesday 15.15-17.00. Room 3721 (May 17)
- Lecture 4: Wednesday 9.15-12.00. Room 3424 (May 18)
- Workshop: Thursday 10.15-12.00. Room 3424 (May 19)
  (Discussions on implementations and methods)

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