WWTF Project ICT15-014

Optimization and Analysis of Large-Scale Networks

Abstract

Networks are a ubiquitous tool to model the growing amount of data collected in science and business. In areas such as telecommunications, location theory, or social networks analysis, the size of the resulting networks and application data is ever increasing and analysis methods for large-scale data are crucial to deal with them in a meaningful way. Especially the combination of large-scale data with aspects such as data uncertainty, existence of competing entities, or multiple conecting objectives challenges existing mathematical methods and solution algorithms. In this project, we developed new algorithmic solution methods that are capable of dealing with large-scale data. Some of the methods proposed also allow to consider one or more of these additional aspects. Within this project we mainly focused on methods that allow to solve such problems to proven optimality. Developed algorithms and solution methods have been evaluated on particularly relevant benchmark problems from operations management, telecommunications, and social network analysis.

Scientific disciplines:
101016 - Optimisation (50%) | 101015 - Operations research (40%) | 102001 - Artificial intelligence (10%)

Keywords:
Operations Research, Combinatorial Optimization, Robust Optimization,Multi-Objective Optimization, Mixed Integer (non-Linear) Programming, SocialNetworks, Telecommunications, Big Data Analysis

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Status: Completed (01.11.2015 - 31.10.2019) 48 months

Funding volume: EUR 450,000

Further links about the involved persons and regarding the project you can find at
https://archiv.wwtf.at/programmes/information_communication/ICT15-014