A cordial invitation to the second talk of the
Brown Bag Seminar
Recent Developments in Data Science:

On oracle complexity of integer programming

By
Dr. Sergei.Chubanov

Date: 13.12.2021 (Monday) at 11:00

Location: Online via Zoom (Link is available in StudIP)

Abstract

One of the central questions, when solving an optimization problem, is how to improve a given feasible solution and whether the given solution is optimal. Having at hand an augmentation oracle, i.e., an algorithm able to deliver an improvement of a given feasible solution provided that this solution is not optimal, we can iteratively apply the oracle in order to solve the problem. The question is how many oracle calls and arithmetic operations we actually need to reach an optimal solution. The same question can be posed when only a verification oracle is available, i.e., an algorithm able to verify optimality of a given solution. In this case one should additionally understand how to produce the next feasible solution by only calling the verification oracle. However, in both cases, we can prove that there exist algorithms running in polynomial oracle time for such important cases as, e.g., nonlinear binary optimization.

Speaker

PD Dr. Sergei Chubanov

PD Dr. Sergei Chubanov is currently Research Scientist at Bosch Center for Artificial Intelligence. His research interests include linear programming, convex optimization, combinatorial optimization, integer linear and nonlinear optimization, and convex optimization in infinite-dimensional spaces. His research contributions basically refer to algorithmic complexity questions. In particular, he developed new polynomial algorithms for linear programming and convex optimization and proved strongly polynomial solvability of systems of linear inequalities having binary solutions. He also proposed fully polynomial time approximation schemes for some problems arising in operations research. Recently, he obtained new theoretical results concerning oracle complexity of integer programming. At Bosch Center for Artificial Intelligence he is also working on algorithms for black-box optimization, automated design of algorithms, and machine learning.