Using Variable Neighbor
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Using Variable Neighborhood Search for Partitioning Sparse Biological Networks into the Maximum Edge-Weighted k-plexes

AVVISO DI SEMINARIO

Mercoledì 27 Giugno 2018
Alle ore 11:00
Sala Seminari - DISCo

Vladimir Filipovic,
Faculty of Mathematics, University of Belgrade

terrà un seminario dal titolo:

Using Variable Neighborhood Search for Partitioning Sparse Biological Networks into the Maximum Edge-Weighted k-plexes

Abstract:
In a network, a k-plex represents a subset of n vertices where the degree of each vertex in the subnetwork induced by this subset is at least n - k.

The maximum edge-weight k-plex partitioning problem (Max-EkPP) deals with determinig the k-plex partitioning in edge-weighted network, such that the sum of edge weights is maximal. The Max-EkPP has an important role in discovering new information in large sparse biological networks.

A variable neighborhood search (VNS) algorithm is designed for solving Max-EkPP. The VNS implements a local search based on the 1-swap first improvement strategy and the objective function that takes into account the degree of every vertex in each partition. The objective function favors feasible solutions, also enabling a gradual increase in terms of objective function value when moving from slightly infeasible to barely feasible solutions.A comprehensive experimental computation is performed on real metabolic networks and other benchmark instances from literature.

Comparing to the integer linear programming method from literature, our approach succeeds to find all known optimal solutions.For all other instances, results of the execution of the VNS either reaches previous best known solution, or supasses it.The proposed VNS is also tested on a large-scaled dataset which was not previously considered in literature.

Short Biography:

He is Associate Professor at Department for computer science, Faculty of Mathematics, University of Belgrade. Member of the Modelling and optimization group within Department for computer science.

He got a PhD in Computer Science from the University of Belgrade. Title of the thesis: "Selection and Migration Operators and Web Services in Evolutionary Applications".

From January 2008 until December 2011 he has been Vice Dean for Academic Affairs at the Faculty of Mathematics.From February 2017 until October 2017 he has been the Head of the Department for Computer Science.

Il seminario è aperto a tutti gli interessati.

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Allegati:
filipovic.pdf

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