1 - Truncated codifferential method for nonsmooth convex optimization

Adil Bagirov, School of Information Technology & Mathematical Sciences, University of Ballarat, University Drive, Mount Helen, P.O. Box 663, 3353, Ballarat, Victoria, Australia, a.bagirov@ballarat.edu.au, *Ali Hakan Tor*

In this paper a new algorithm to minimize convex functions is developed. This algorithm is based on the concept of codifferential. Since the computation of whole codifferential is not always possible we propose an algorithm for computation of descent directions using only a few elements from the codifferential. The convergence of the proposed minimization algorithm is studied and results of numerical experiments using a set of test problems with convex objective function are presented. We also compare the new algorithm with the bundle method using the results of numerical experiments.

2 - Recente results on graphs with convex quadratic stability number

Maria F Pacheco, Instituto Politécnico de Bragança - ESTiG, Quinta de Santa Apolónia, Gab. 112, 5301-857, Bragança, Portugal, pacheco@ipb.pt, *Domingos Cardoso*

The main results about graphs with convex quadratic stability number (that is, graphs for which the stability number can be determined by convex quadratic programming) are surveyed including the most recently obtained. Furthermore, a few algorithmic techniques for the recognition of this type of graphs in particular families are presented.

3 - An upper bound on the 2-club number of a graph

Carlos J. Luz, Math, Escola Sup. Tecnologia Setúbal / Instituto Politécnico de Setúbal, Campus do IPS, Estefanilha, 2910-761, Setúbal, Portugal, cluz@est.ips.pt

A 2-club of a graph is a subset of nodes that induces a subgraph of diameter 2. This communication deals with the maximum 2-club problem which consists on finding a maximum 2-club in an undirected given graph. The cardinality of a maximum 2-club of a graph is usually called the 2-club number of that graph. We first present a convex quadratic programming upper bound for the 2-club number of a graph. Then, we state a sufficient condition for a graph to attain the proposed upper bound. Finally, we improve the offered upper bound and report on its application to several graphs.

WD-25

Wednesday 12:55-14:15
GSI - S 25

Cooperation in assignment and inventory situations

Stream: Cooperative Game Theory

Invited session

Chair: *Judith Timmer*, Dept. of Applied Mathematics, University of Twente, P.O. Box 217, 7500 AE, Enschede, Netherlands, j.b.timmer@utwente.nl

1 - The maximum and the addition of assignment games

Silvia Miquel, C/ Jaume II 73, 25001, Lleida, smiquel@matematica.udl.cat, *Marina Nunez*

Shapley and Shubik (1972) define assignment games as cooperative TU games for two-sided markets. Here, we consider a finite set of assignment games and each set of players can choose to play in one of those games. This is represented by the maximum of assignment games and a balancedness condition is obtained. We also consider that each set of players can play simultaneously more than one assignment game and then add the profits. This is represented by the sum of assignment games which is balanced. Under some conditions, the core of the sum game coincides with the sum of the cores.

2 - Cooperation in stochastic inventory models with continuous review

Judith Timmer, Dept. of Applied Mathematics, University of Twente, P.O. Box 217, 7500 AE, Enschede, Netherlands, j.b.timmer@utwente.nl

We study the inventory management of multiple firms facing stochastic demand. All inventories are monitored continuously. Firms may form a coalition and place joint orders for replenishment of their inventories. In particular, as soon as one firm reaches its reorder point all other firms in the coalition join this firm and order up to their desired inventory levels. The corresponding cost game is studied for properties and nice solutions. Analytical studies show that the game is concave and balanced. Hence, the Shapley value is a natural candidate for cost allocation among the firms.

3 - Inventory transportation networks: benefits by collaboration

Ana Meca, Operations Research Center, Universidad Miguel Hernández, Avda. Universidad s/n, Edificio Torretamarit, 03202, Elche, Alicante, Spain, ana.meca@umh.es, *Mª Gloria Fiestras-Janeiro, Ignacio García-Jurado, Manuel Alfredo Mosquera Rodríguez*

The aim of this talk is to study inventory situations where transportation costs are different for each agent. The underlying allocation cost problem is analyzed by defining a class of cooperative TU cost games. We characterize the situations for which cooperation is profitable and propose some allocations of the total cost. One of these allocation is obtained "à la Shapley' by computing the average of some marginal costs which belong to the core. We provide a characterization of this rule using properties as E-Balanced Contribution (EBC), Extreme agent solidarity (EAS), and E-Transfer (ETR).

WD-26

Wednesday 12:55-14:15
GSI - S 35

Lot Sizing II

Stream: Discrete Optimization

Contributed session

Chair: *Jan Christian Lang*, Chair of Operations Research, Department of Law, Business and Economics, Technische Universität Darmstadt, Germany, Hochschulstr. 1, 64289, Darmstadt, Germany, jclang@bwl.tu-darmstadt.de

1 - Lot sizing by considering purchase discount in mrp system

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