

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

PHD PROGRAM IN INFORMATION AND TECHNOLOGY FOR HEALTH

Seminar announcement

Wednesday 26th June 2024, Time: 11:30 - 12:30

Room I4 - Via Claudio, 21 - Naples



Prof. A.M. Rodríguez-Chía

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On the Single Allocation hub location problems: New formulations and Solving Methods

Abstract: A new compact formulation for uncapacitated single-allocation hub location problems with fewer variables than the previous Integer Linear Programming formulations in the literature is introduced. Our formulation works even with costs not based on distances and not satisfying triangle inequality. Moreover, costs can be given in aggregated or disaggregated way. Different families of valid inequalities that strengthen the formulation are developed and a branch-and-cut algorithm based on a

relaxed version of the formulation is designed, whose restrictions are inserted in a cut generation procedure together with two sets of valid inequalities. The performance of the proposed methodology is tested on well-known hub location data sets and compared to the most recent and efficient exact algorithms for single-allocation hub location problems. Extensive computational results prove the efficiency of our methodology, that solves large-scale instances in very competitive times.

Lecturer short bio: *A.M. Rodríguez-Chía is full professor of the Dpt. of Statistics and Operations Research of Cádiz University, since 2015. Since the beginning of his research activity, he has been working in continuous and discrete optimization problems, with particular focus on location problems. In addition, his research has been devoted to the study of optimization of large-scale complex networks and the analysis of data science problems from the point of view of optimization. Recently, he is also involved in the optimization of reconstruction of nano-scale particles using Electronic Tomography. Regarding the research projects, he has participated since 2007, without interruption, as a main researcher in projects financed by the National/State R&D&I Plan of the Spanish Ministry. He was main researcher of the Spanish network on Locational Analysis and Related Problems, 2012-2019, His interest in bringing mathematical knowledge to the industry and society has led him to also collaborate and conduct contract projects funded by corporations, as for instance NanoMEGAS (Optimization on the reconstructions of nanoparticles with Electron Tomography), Orbystat and Satinel System (Optimization in road transportation). He has supervised five doctoral theses, one of them obtained the extraordinary doctorate award. He is member of the editorial board of the journal Networks (Wiley).*

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