

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**

**Friday 28<sup>th</sup> June 2024, Time: 11:00 - 12:00**

**Room I4, - Via Claudio, 21 - Naples**



### **Prof. Marta Baldomero-Naranjo**

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## **The maximal covering location problem with edge downgrades**

**Abstract:** This research addresses the downgrading version of the maximal covering location problem within a network. In this problem, two actors with conflicting objectives are involved:

a) The location planner aims to maximize the covered demand while anticipating that an attacker will attempt to reduce coverage by increasing the length of the edges

b) The attacker seeks to maximize the demand initially covered by the facilities but left uncovered after the downgrade. To achieve this, they can increase the length of certain edges within a specified budget.

We introduce a bilevel mixed-integer program to formulate the problem, followed by a preprocessing phase and a matheuristic to solve it. Additionally, computational results are presented to illustrate the potential and limitations of the proposed algorithm.

**Lecturer short bio:** *Marta Baldomero Naranjo is assistant professor at the Universidad de Cádiz. She is a researcher in the area of Mathematical Optimization. Her research focuses on developing models and algorithms for data science and location theory problems. Predominantly, she works on methodological advances to obtain optimal solutions but has also developed some heuristic algorithms. Additionally, she explores the complexities of optimization problems. Thanks to the results obtained, she received the Accésit and Special CSIC Award in the XVI Certamen Universitario Arquímedes 2017, the Ramiro Melendreras 2022 Award from the Society of Statistics and Operations Research and was named YoungWomen4OR 2022 by WISDOM. She is a member of the editorial board of the Boletín de Estadística e Investigación Operativa (BEIO).*

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