UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Data-driven Optimization

2223-87R-05

Title

Data-driven Optimisation

Teacher(s)

Guglielmo LULLI and Vinh DOAN

Language

English

Short description

Optimisation is an Operational Research methodology that provides solutions to real-world decision problems across a wide range of application areas. Indeed, Optimisation has been successfully applied in many fields, e.g., Management Science, Statistics, Quantitative Finance, Computer Science, Engineering and the Physical Sciences. Optimisation models are now used routinely in industry, e.g., manufacturing, energy production and transport, in the public sector such as defence and healthcare, and in the services (especially finance). The scope of this module is to cover key elements of Optimisation.
More in particular, the focus of the course is in highlighting possible integration of data sampling, machine learning and optimization techniques. Data-driven optimization covers many related topics:

– optimization from samples,
– combinatorial online learning,
– optimization under uncertainty
– learning-based combinatorial optimization, among others.
The course is delivered by experts in the field with strong publication records and experience in the design and deployment of these methods on real-world problems. The course is suitable for participants from a wide range of backgrounds, from those that are new to optimisation to those that already have some knowledge in optimisation but want to learn more about its applicability to decision-making.

Aim:
On completion of the course, participants should have an understanding of data-driven optimisation methods and their use to solve decision making problems. Participants will become familiarised with strengths and limitations of different optimisation approaches. They will also get acquainted with some software tools for the rapid implementation and resolution of optimisation models including tools for prototyping heuristic algorithms.

CFU / Hours

16 hours of (face-toface) lectures

Teaching period

Tuesday July 11, Wednesday July 12 and Thursday July 13

Sustainable Development Goals