

## Integration of Operations Research and Data Science: Towards new Paradigms for Optimization

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Operations Research (OR) is an established and widely used discipline aimed at employing mathematical methods and computer science to support decisions of planners in several application areas ranging from industry to transportation, energy production and distribution and resource scheduling. During the last decades a rich set of effective methodologies were developed within Operations Research for the solution of hard combinatorial optimization problems which generally rely on their structured mathematical optimization formulations. In the recent years, Data Science (DS), and in particular Machine Learning and Data Mining, emerged as a powerful set of techniques capable of extracting relevant information from large amounts of data for which no analytical distributions and mathematical formulations are known: this is generally performed by using statistical formulations solved through mathematical optimization techniques.

The strong connections between OR and DS can foster important advances in the possibility of effectively support decision making both by improving the effectiveness DS algorithms and in allowing a broader and more robust applicability of OR methods. This talk will provide an overview of such opportunities from an OR perspective by examining the current research stream where DS techniques are used to improve the performance of algorithms used to solve important combinatorial problems.

## References

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