

CHALLENGES AND INNOVATIVE SOLUTIONS IN OPTIMIZATION AND DATA-DRIVEN APPROACHES FOR INDUSTRIAL AND REAL-WORLD PROBLEMS

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ABSTRACT

Optimization problems arise in a wide variety of real-world applications including, for instance, artificial neural networks, healthcare, image analysis and reconstruction, and many others. The mathematical analysis of the optimization problem and its application are therefore often intertwined. This has become especially critical in recent years, when increasingly faster developments in many fields of science and technology have called for innovative optimization approaches to solve new problems in emerging applied settings. A straightforward example is given by the rapid diffusion of artificial intelligence and machine learning, which are revolutionizing industry and several aspects of everyday life.

Aim of this Invited Session is to provide a platform to discuss recent advances in the field of optimization, both on a theoretical and on a more practical viewpoint. In this context, contributions that mainly focus on the formulation of an optimization problem arising from a complex applied setting, on innovative methods for its solution, or on the application itself are all equally welcome.

Consequently, topics of interest include (but are not limited to): optimization for data driven approaches, machine learning and artificial intelligence, image restoration and understanding, shape and topology optimization. Complex industrial scenarios which require the solution of an optimization problem are of particular interest.