Continuous optimization

ECTS : 6

Volume horaire : 24

Description du contenu de l'enseignement :

This course will cover the bases of continuous, mostly convex optimization. Optimization is an important branch of applied industrial mathematics. The course will mostly focus on the recent development of optimization for large scale problems such as in data science and machine learning. A first part will be devoted to setting the theoretical grounds of convex optimization (convex analysis, duality, optimality conditions, non-smooth analysis, iterative algorithms). Then, we will focus on the improvement of basic first order methods (gradient descent), introducing operator splitting, acceleration techniques, non-linear (”mirror”) descent methods and (elementary) stochastic algorithms.

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