Bocconi

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Bocconi University
Room 3.E4.SR03
Via Röntgen 1 Milano (3rd floor)

More advanced models for functions with constraints, with applications to non-convex optimization and beyond

Speaker

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Abstract

Many problems in applied mathematics admits a natural representation in terms of non-negative functions, e.g. probability representation and inference, optimal transport, optimal control, non-convex optimization, to name a few. While linear models are well suited to represent functions with output in R or C, being at the same time very expressive and flexible, the situation is different for the case of non-negative functions where the existing models lack one of these good properties.

In this talk we present a model for non-negative functions that promises to bring to these problems, the same benefits that linear models brought to interpolation, approximation, quadrature and supervised learning, leading to a new class of adaptive algorithms with provably fast convergence.

In particular, we will show direct applications in numerical methods for probability representation and non-convex optimization. We will see more in detail that the model allows to derive an algorithm for non-convex optimization that is adaptive to the degree of differentiability of the objective function and achieves optimal rates of convergence. Finally, we show how to apply the same technique to other interesting problems in applied mathematics that can be easily expressed in terms of inequalities.

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