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Abstract

Restricting ambitions in global multi-objective optimization of costly functions

Bayesian algorithms (e.g., EGO, GPareto) are a popular approach to the mono and multi-objective optimization of costly functions. Despite the gains provided by the Gaussian models, convergence to the problem solutions remains out of reach when the number of variables and / or the number of objective functions increase. In this presentation, we describe two ways, both involving Gaussian processes, to restrict ambitions in order to recover problems that can be solved. First, in multi-objective optimization, we discuss targeting the center of the Pareto front: what is a Pareto front center? How to detect it? What to do once it is found? Second, we provide elements of sensitivity analysis specific to optimization to freeze some of the variables: what variables count in optimization? How to fix the other variables? This talk summarizes joined works with David Gaudrie, Adrien Spagnol, Sébastien Da Veiga and Victor Picheny.