

学术报告

A new smoothing technique for non-smooth optimization problems

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Abstract : Optimization problems involving non-smooth terms is prevalent in machine learning and statistics, such as ridge regression, compressed sensing, multi-class multi-label learning, to name a few. Usually technique for treating non-smooth terms includes methods based on operator splitting, Fenchel duality and Moreau envelope. In this talk, we will present a new type of smoothing technique called compensated convex transform, originally proposed by Kewei Zhang. This new type of approximation technique provides analytical formula for many submodular functions including the famous max function (possibly composed with a set of convex functions), squared distance function to a finite set and upper transform for some non-smooth convex functions in mathematical programming. The benefit of this is that it is a $C^{1,1}$ function and a tighter approximation than Moreau envelop, and it preserves convexity. Therefore, it allows first order optimization techniques that are unavailable for non-smoothness functions, and the approximation error estimate can be conveniently obtained.

欢迎大家参加！