

Departmental Colloquium

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**Wednesday, September 12, 2018
2:00pm, HH-3017**

Nonsmooth, Nonconvex Optimazation: Algorithms and Examples

Abstract:

In many applications one wishes to minimize an objective function that is not convex and is not differentiable at its minimizers. We discuss two algorithms for minimization of general nonsmooth, nonconvex functions. Gradient Sampling is a simple method that, although computationally intensive, has a nice convergence theory. The method is robust and the convergence theory has been extended to constrained problems. BFGS is a well known method, developed for smooth problems, but which is remarkably effective for nonsmooth problems too. Although our theoretical results in the nonsmooth case are quite limited, we have made some remarkable empirical observations and have had broad success in applications. Limited Memory BFGS is a popular extension for large-scale problems, but we show that, in contrast to BFGS, it sometimes converges to non-optimal nonsmooth points. Throughout the talk we illustrate the ideas through examples, some very easy and some very challenging.