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Title: « Computer-aided analyses of optimization methods via potential functions »

Abstract:

Potential (or Lyapunov) functions are very versatile and popular tools for analyzing optimization methods.

Although conceptually simple, this type approach requires choosing the right potential for performing the analyses of interest---just as analyzing the stability of a dynamical system might require choosing the right decreasing Lyapunov, or energy, function.

In this talk, want to illustrate that in the context of first-order optimization, the search for such potentials can be largely eased through the use of semidefinite programming.

The presentation will be example-based and focus on gradient descent, and along with some of its accelerated and stochastic versions.

Joint work with Francis Bach.