Convex Optimization Notes

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1 Introduction

Quadratic optimization problems (including, e.g., least-squares) form the base of the hierarchy; they can be solved exactly by solving a set of linear equations. *Newton's method* is the next level in the hierarchy. In Newton's method, solving an unconstrained or equality constrained problem is reduced to solving a sequence of quadratic problems. *The interior-point methods*, which form the top level of the hierarchy, solve an inequality constrained problem by solving a sequence of unconstrained, or equality constrained, problems.

Besides Newton's method, there are quasi-Newton, conjugate-gradient, bundle, cutting-plane algorithms, and etc.