Invited Talk Abstract

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A Conditional-Gradient-Based Single-Loop Augmented Lagrangian Method for Inequality Constrained Problems

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Abstract

We consider the problem of minimizing the sum of a Lipschitz differentiable convex function and a proper closed convex function that admits efficient linear optimization oracles, subject to multiple smooth convex inequality constraints. We adapt the classical augmented Lagrangian (AL) method for these problems: in each iteration, our algorithm consists of one step of conditional gradient (CG) method applied to the AL function, followed by an update of the dual variable as in classical AL methods with a diminishing dual stepsize. We study the convergence rate of our algorithm under two standard stepsize rules for the CG method, namely, an open-loop stepsize and the short stepsize, and obtain a rate that matches the best-known complexity for this class of problems. We also establish accelerated rates when the aforementioned proper closed convex function is the indicator function of a uniformly convex set. This is a joint work with Xiaozhou Wang and Zev Woodstock.