THE UNIVERSITY  OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

C O L L O Q U I U M

Complexity of proximal augmented Lagrangian type methods for solving nonconvex composite optimization problems with nonlinear convex constraints

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Abstract

This talk reviews augmented Lagrangian type methods for solving linearly (or convex nonlinearly) constrained nonconvex composite optimization (LC-NCO) problems and discusses their corresponding complexity results. It then describes a more recent inner accelerated inexact proximal augmented Lagrangian (IAIPAL) method for solving LC-NCO problems that is based on the classical augmented Lagrangian (AL) function. More specifically, each IAIPAL iteration consists of inexactly solving a proximal AL subproblem by an accelerated composite gradient (ACG) method followed by a classical Lagrange multiplier update. Under the assumption that the domain of the composite function is bounded and the problem has a Slater point, it is shown that IAIPAL generates an approximate stationary solution in $\mathcal{O}(\rho^{-3})$ ACG iterations (up to a logarithmic term) where $\rho > 0$ is the tolerance for both stationarity and feasibility. Moreover, the above bound is derived without assuming that the initial point is feasible. Finally, numerical results are presented to demonstrate the strong practical performance of IAIPAL.

Date:	October 8, 2021 (Friday)
Time:	10:00 – 11:00am (Hong Kong Time)
Venue:	ZOOM: https://hku.zoom.us/j/ Meeting ID: 927 0541 7562 Password: 562748

All are welcome