A two-phase augmented Lagrangian method for convex composite quadratic programming

Xudong Li[a], Defeng Sun[b], and Kim-Chuan Toh[c]

[a]Department of Mathematics, National University of Singapore

[b]Department of Mathematics, National University of Singapore

[c]Department of Mathematics, National University of Singapore

This talk is concerned with an important class of high dimensional convex composite quadratic optimization problems with large numbers of linear equality and inequality constraints. The motivation for this work comes from recent interests in important convex quadratic conic programming problems, as well as from convex quadratic programming problems with dual block angular structures arising from network flows problems, two stage stochastic programming problems, etc. In this talk, we first introduce a symmetric Gauss-Seidel (sGS) decomposition theorem for solving an unconstrained convex composite quadratic programming. Then, based on this sGS decomposition theorem, we propose a two phase augmented Lagrangian method to solve the targeted problems to desired accuracy efficiently, with Phase I to generate a reasonably good initial point and Phase II to obtain accurate solutions fast.