

# Toward Implementation of Semidefinite Program Relaxations of Polynomial Optimization Problems

Sunyoung Kim

Department of Mathematics, Ewha Womans Univ.

skim@ewha.ac.kr

Semidefinite programming and second order cone programming relaxations that can be used in the framework of branch-and-bound techniques are proposed. The semidefinite programming and second order cone programming relaxation methods are designed to exploit the structure of a polynomial optimization problem, provide effective bounds as the feasible region shrinks, and detect the infeasibility. In particular, linear constraints are derived using the relationship between original and linearized variables to strengthen semidefinite programming and second order cone relaxations. Numerical results of the proposed methods are included to show the improved efficiency and effectiveness.