SUMS OF SQUARES AND SEMIDEFINITE PROGRAMMING RELAXATIONS FOR POLYNOMIAL OPTIMIZATION PROBLEMS WITH STRUCTURED SPARSITY

MASAKAZU MURAMATSU

Abstract. Unconstrained and inequality constrained sparse polynomial optimization problems (POPs) are considered. A correlative sparsity pattern graph is defined to find a certain sparse structure in the objective and constraint polynomials of a POP. Based on this graph, sets of supports for sums of squares (SOS) polynomials that lead to efficient SOS and semidefinite programming (SDP) relaxations are obtained. Numerical results from various test problems are included to show the improved performance of the SOS and SDP relaxations.