
FEI WANG, University of Western Ontario

Polynomial optimization by SDP and facial reduction

Recent breakthroughs have been made in the use of semidefinite programming and its application to real polynomial solving. Existing methods are computationally expensive and have poorer accuracy on larger examples. In this talk we give a method to compute the generators of the real radical for any given degree d . We combine the use of moment matrices and techniques from SDP optimization: facial reduction first developed by Borwein and Wolkowicz. In use of the semidefinite moment matrices to compute the real radical, the maximum rank property is very key, and with facial reduction, it can be guaranteed with very high accuracy. Our algorithm can be used to test the real radical membership of a given polynomial. In a special situation, we can determine the real radical ideal in the positive dimensional case