

# Semidefinite programming for polynomial optimization and robust control

Didier Henrion (LAAS-CNRS Toulouse, France  
and Czech Technical University in Prague, Czech Republic)

We survey some recent developments in semidefinite programming (SDP), a branch of mathematical programming that deals with convex optimization in the cone of positive semidefinite matrices, or equivalently, over linear matrix inequalities (LMIs). Building on results of functional analysis and real algebraic geometry, we show how SDP can be used to solve numerically nonconvex polynomial optimization problems. We will try to focus on the linear algebra components specific to these techniques: quasi-Hankel structure of moment matrices, eigenvalue problems on generalized companion matrices.