

Juan C Vera

Tilburg University, Netherlands
j.c.veralizcano@tilburguniversity.nl

Certificates of non-negativity are fundamental tools in optimization. Recently, sum-of-square certificates for non-negativity of polynomials over semialgebraic sets, have been used to obtain powerful numerical techniques to address the solution of polynomial optimization problems. Usually these certificates (e.g. Schmudgen and Putinar Positivstellensatz) require the semialgebraic set to be compact.

We present a new certificate of non-negativity for polynomials that no require the semialgebraic set to be bounded. We use this certificate to generalize classical results regarding the non-negativity of quadratic polynomials over sets defined by a quadratic. We also use it to obtain a convergent hierarchy of linear matrix inequalities for polynomial optimization problems with unbounded feasible sets.

Joint work with Javier Pena (Carnegie Mellon, USA) and Luis Zuluaga (Lehigh, USA).