An Effective Positivstellensatz over the Rational Numbers for Finite Semialgebraic Sets

Teresa Krick

Universidad de Buenos Aires & Conicet, Argentina

I will present a joint result with Lorenzo Baldi and Bernard Mourrain, on the exact representation of multivariate rational polynomials that are nonnegative on finite semialgebraic sets as sums of squares of rational polynomials. We provide existential results for the strictly positive case and a sufficient existence condition for the nonnegative case, together with degree and height (binary size) bounds for the expressions as sums of squares.

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