

Elementary recursive degree bounds for Hilbert's 17th problem and Positivstellensatz

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Artin's solution to Hilbert's 17th problem was one of the great achievements of modern algebra, nearly one century ago and Positivstellensatz was proved several decades later by similar methods. Getting explicit degree bounds for these problems has been a long process. Primitive recursive degree bounds rely on proof theoretical methods combined with algebraic constructions. Computer algebra, more specifically subresultants and sign determination, has been the extra ingredients needed to obtain elementary recursive degree bounds.

This talk is based on work of Henri Lombardi and joint work of myself with Henri Lombardi and Daniel Perrucci.