

CONDITION-BASED BOUNDS ON THE NUMBER OF REAL ZEROS

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Unlike in complex algebraic geometry, the number of zeros of a real polynomial system is not always the same. In this poster, we explore a new relationship between the number of real zeros and the condition number of a real polynomial system. Among other things, we show that real polynomial systems with many zeros are ill-conditioned and we obtain probabilistic bounds on the number of real zeros of robust classes of random real polynomial systems. Moreover, our method points out to a new possible family of algorithms in real and complex numerical algebraic geometry where the complexity only depends on the logarithms of the condition number and not the condition number itself.

Joint work with Elias Tsigaridas (Inria Paris & IMJ-PRG, France).