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Hermite Matrices and their signatures

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Abstract

Let I be an ideal generated by polynomials f_1,...,f_m such that f_i is in R[x_1,...,x_n] for all i=1,...,m. First we describe how to construct a Hermite matrix with respect to the ideal I and an auxiliary polynomial g in R[x_1,...,x_n]. Then, we will define the signature of Hermite matrices. For some choices of the auxiliary polynomial g, signatures can reveal some interesting properties of the given polynomial system. Some of them are related to real counting, real root isolation, and sum of squares.

Date : Friday, November 5, 2021

Time: 17:00

Place: IMBM, Boğaziçi University South Campus