ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

14. Mathematical Aspects of Computer Science

1991 MS Classification: 14, 51, 68
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An Efficient Algorithm for Solving Real Polynomial Equations: The Complete Intersection Case

The talk concerns the algorithmic problem of finding at least one representative point in each connected component of a real compact smooth variety defined by a regular sequence of multivariate polynomials with rational coefficients. The algorithm represented by an arithmetic network consists in transferring to the real case a procedure that finds the complex zeros of a given zero-dimensional polynomial equation system in non-uniformal time that is polynomial in the length of the input (given by an arithmetic circuit) and an adequately defined geometric degree of the equation system.
Reference: B. Bank, M. Guisti, J. Heintz, G. M. Mbakop, Polar Varieties, Real Equation Solving, and Data Structures: The Hypersurface case. Journal of Complexity 13, 5 – 27 (1997)