
0756.14031**Heintz, Joos; Krick, Teresa; Roy, Marie-Françoise; Solernó, Pablo****Geometric problems solvable in single exponential time.** (English)

Applied algebra, algebraic algorithms and error-correcting codes, Proc. 8th Int. Conf., AAEECC-8, Tokyo/Jap. 1990, Lect. Notes Comput. Sci. 508, 11-23 (1991).

[For the entire collection see [Zbl 0727.00017](#).]

This paper gives an overview over a series of new algorithmical results in computational semialgebraic geometry which are based on a single exponential sequential time and polynomial parallel time algorithm. — The aim of the paper consists rather in presentation of results, their motivation and interrelations than in providing complete proofs.

For a semialgebraic set S given by a boolean combination of polynomial inequalities, the algorithmic method solves the following problems: computation of the dimension of S , computation of the number of semialgebraically connected components of S and construction of paths in S connecting points in the same component, computation of the distance of S to another semialgebraic set and finding points realizing the distance if they exist, computation of the “optical resolution” of S if S is closed (the pelotita and the bolón) and computation of integer Morse directions of S if S is a regular algebraic hypersurface.

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