POLYNOMIAL REPRESENTATIONS OF POLYHEDRA

MARTIN HENK

Abstract

By a theorem of Bröcker and Scheiderer, every basic closed semi-algebraic set

$$\{x \in \mathbb{R}^n : p_1(x) \geq 0, \ldots, p_m(x) \geq 0\},$$

where p_i are polynomials, can also be described by at most $n(n+1)/2$ polynomial inequalities. All known proofs of this result are highly non-constructive. Motivated by a question in combinatorial optimization we are interested in algorithmic constructions of such a representation by few polynomials for the very special class of semi-algebraic sets consisting of polyhedra. The talk surveys recent results on this problem.

Martin Henk, Universität Magdeburg, Institut für Algebra und Geometrie, Universitätsplatz 2, D-39106 Magdeburg, Germany

E-mail address: henk@math.uni-magdeburg.de

http://fma2.math.uni-magdeburg.de/~henk/