

## **A constructive approach to characterization of polynomials strictly positive on a compact semialgebraic set**

Affine-linear functions  $f$  strictly positive on a given nonempty polyhedron  $P$  can be characterized with the help of the well-known Farkas' lemma. In my talk I would like to discuss generalizations of such a characterization to the case that  $f$  is an arbitrary polynomial and/or  $P$  is a bounded set described by a system of nonstrict polynomial inequalities. Such generalizations are provided by results of Handelman (1988), Schmüdgen (1991), Putinar (1993), Jacobi and Prestel (2001). The mentioned results serve as a theoretical foundation for polynomial optimization. In my talk I will discuss a simple, (mostly) elementary and constructive proof of these results, which relies on ideas of Berr, Wörmann (2001) and Schweighofer (2002,2005).