Topological definition of dimension of semi-algebraic sets

Patrick Michalski

Master Seminar on Real Algebraic Geometry
University of Konstanz

Abstract

Let R be a real closed field. A semi-algebraic set $A \subseteq R^n$ can be decomposed into a union of semi-algebraic sets A_i each homeomorphic to an open hypercube $(0,1)^{d_i}$. This allows to give a topological definition of the dimension of A, namely the maximum of the d_i. In this seminar, this notion will be introduced, discussed and compared with the dimension of A as an algebraic set, i.e. the dimension of its Zariski closure in R^n. The aim is to prove that both notions are equivalent.