

Algebraic measures of singularity

Javid Validashti, Cleveland State University, Cleveland, OH – 44115

Abstract

The theory of multiplicities is ubiquitous in algebra. For instance, due to the seminal work of Rees in the 60's, Hilbert-Samuel multiplicity plays a fundamental role in the theory of integral dependence of ideals. Multiplicity theory is widespread in geometry as well, particularly in equisingularity theory, influenced by the pioneering work of Whitney in the 50's, which were followed by Zariski, Thom, Mather, Teissier, Kleiman, Thorup, and Gaffney until the present time. The idea is to understand how topological similarity in a family of singularities are captured by various algebraic properties and invariants. There are also elegant combinatorial interpretations of multiplicities in terms of volumes of certain polytopes. In this talk, I will survey some of the classical results and I will discuss the new developments that have made it possible to investigate more complex singularities.

Keywords: multiplicity theory, topological similarity, volumes of polytopes.