SCALING IN A METRIC SPACE

GUY WALLET

Topic #2: *Nonstandard methods in Algebra, Algebraic Geometry and Topology.*

The purpose of this work is to introduce a nonstandard construction allowing to define and to study systematically:

(1) a general notion of scaling in a metric space,
(2) the topological deformations inferred by this kind of transformation.

This theory provides a model for the phenomena of topological deformation which occurs when one compares data represented at different scales in systems of geographic informations and spatiotemporal data bases. Our notion of scaling is related to the concept of asymptotic cone defined by van den Dries and Wilkie (1984) in order to generalize Gromov's limit process in the class of metric spaces. The main difference between our work and the preceding ones is that:

(a) we consider any scale (small, large),
(b) we focus on the effect of transition from a scale to another one,
(c) we wish to understand what kind of mathematical structure is appropriate for representing those transformations.

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