

Public Abstract

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Graduation Term:SP 2011

Department:Mathematics

Degree:MA

Title:Quasi-Metric Geometry: Smoothness and Convergence Results

This thesis has two distinct yet related parts, geometry being the underlying theme. The first part explores a procedure which associates to a given quasi-metric a better behaved one, then builds the notion of the Hausdorff outer-measure generalized to the setting of quasi-metric spaces, followed by versions of the Kuratowski and Frechet embedding theorems appropriate to the setting of quasi-metric spaces, followed by applying this to extending the Gromov-Pompeiu-Hausdorff distance to being able to measure distance between quasi-metric spaces, finally concluding with different smoothness indices and how these interact with embedding properties, richness of Holder functions and fractals.

The second part deals with seeing how Euclidean Geometry interacts with analysis, namely the characterization of Lipschitz domains via cones, Lyapunov domains in via pseudo-balls, a sharp version of the Hopf-Oleinik Boundary Point Principle, and subsequently an improved version of the Strong Maximum Principle.