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Quantitative Aspects of Topology

In the popular imagination, there is a strict dichotomy between the quantitative and the qualitative and Topology is the epitome of the qualitative. However, many problems, both theoretical and applied, have suggested a need for topology to encompass estimates and to grow to include discontinuous maps. I will try to explain some of these via examples taken from problems like estimating solutions to equations, the influence of the fundamental group on the geometry/topology of manifolds, and recent methods of data analysis.