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Statistical Inference For Persistent Homology

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(Submitted on 28 Mar 2013)

Persistent homology is a method for probing topological properties of point clouds and functions. The method involves tracking the birth and death of topological features as one varies a tuning parameter. Features with short lifetimes are informally considered to be "topological noise." In this paper, we bring some statistical ideas to persistent homology. In particular, we derive confidence intervals that allow us to separate topological signal from topological noise.

Subjects: **Statistics Theory (math.ST)**; Computational Geometry (cs.CG); Learning (cs.LG)

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