

1077-55-986

Paul Louis Bendich* (bendich@math.duke.edu) and **Jacob Harer**. *Φ -somap: Estimating Intrinsic Distance Using Persistent Homology*. Preliminary report.

Many dimension reduction techniques (including IsoMap) start by constructing a graph on the data in order to estimate the geodesic distance from the underlying manifold. We present a algorithm that uses persistent homology (in dimensions one and zero) to construct a weighted proximity graph based on a carefully chosen ϵ ; our initial experiments show that the shortest path metric associated to this graph produces strikingly good estimates of the underlying geodesic distance. (Received September 15, 2011)