1115-55-271 **Brittany Terese Fasy*** (brittany@fasy.us), Montana State University, Computer Science Department, 357 EPS Building, Bozeman, MT 59717. *Statistics in TDA.*

Persistent homology is a widely used tool in Topological Data Analysis that encodes multi-scale topological information as a multi-set of points in the plane, called a persistence diagram. 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," and those with a long lifetime are considered to be "topological signal." We bring some statistical ideas to persistent homology in order to derive confidence sets that allow us to separate topological signal from topological noise. We also observe that it is difficult to apply statistical theory directly to a random sample of diagrams. Instead, we summarize the persistent homology with the persistence landscape and silhouette, which convert diagrams into a well-behaved real-valued functions. We can then apply statistical theory to these functions rather than the original diagrams. (Received September 21, 2015)