

1077-55-2288

**Paul Bendich** and **Bei Wang\*** ([beiwang@sci.utah.edu](mailto:beiwang@sci.utah.edu)), Scientific Computing and Imaging Institute, 72 So. Central Campus Drive, Salt Lake City, UT 84112, and **Sayan Mukherjee**.

*Stratification Learning through Local Homology Transfer.*

A stratified space is a collection of manifolds of different dimensions which fit together uniformly inside some larger space. The objective of this talk is to show that data sampled from such a space can be clustered by strata. We first define a multi-scale notion of stratified spaces, providing a stratification at different scales which are indexed by a radius parameter. We then use methods derived from kernel and cokernel persistent homology to cluster the data points into different strata. We prove a correctness guarantee for this clustering method under certain topological conditions. We then provide a probabilistic guarantee for the clustering for the point sample setting: we provide bounds on the minimum number of sample points required to state with high probability which points belong to the same strata. Then, we give an algorithm for the clustering. Finally, we will discuss some potential extensions and on-going work. (Received September 22, 2011)