TEXAS ★ STATE
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The rising STAR *of Texas*

Texas State Topology Seminar

Friday, March 3, 11:00-noon, in DERR 229.

Dr. Anton Dochtermann
" Persistent Homology"

ABSTRACT

Suppose X is a collection of points sampled from some unknown space. A fundamental question in topological data analysis (TDA) is to measure topological features of the underlying space from the point cloud itself, to determine the `shape of the data'. We survey work of Carlsson and others in which one assigns a parametrized collection of simplicial complexes to the data, and computes how simplicial homology changes throughout the family. Via some basic commutative algebra, the emergence/disappearance of betti numbers can then be encoded in `barcodes' where the `persistent homology' can be used to interpret holes in the underlying space. If time permits we may mention other algebraic/categorical approaches including zig-zag persistence, mulitdimensional persistence, barcode stability, etc.