

Applying persistent homology to brain artery imaging

Prof. Dr. Ezra Miller
(Duke-Universitt, Durham, NC)

March 10, 2014

Persistent homology measures geometric structures using topological invariants. When the structures are magnetic resonance images of arteries in human brains, persistent homology records the connectedness of an increasing subset of the vessels.

Although the theory of persistent homology is relatively well developed, and many aspects of its behavior are understood in synthetic examples, it remains largely untested on genuine experimental data.

This talk explains what we have learned about the geometry of blood vessels in aging human brains, as well as lessons this exploration has taught us about applications of persistent homology in general.

Joint work with Paul Bendich, Steve Marron, and Sean Skwerer.