Applied Topology in Albany (ATiA) Seminar

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Virtual Persistence Diagrams, Signed Measures, and Wasserstein Distance

Friday, February 26, 2021
2:00 p.m. on Zoom

Abstract. It is well-known that persistence diagrams can be obtained from the rank function via Möbius inversion. In the case of the graded rank function introduced by Betthauser, Bubenik, and Edwards, Möbius inversion gives rise to sets of ordered pairs which may have negative multiplicities. We call these virtual persistence diagrams. We show that the 1-Wasserstein distance extends to virtual persistence diagrams in a natural way. We also consider the measure-theoretic analog of signed measures and distances between them. Motivated by the work of Divol and Lacombe, we set up a framework for discussing the (signed) Wasserstein distances for persistence diagrams and measures defined on arbitrary pairs of metric spaces.

N.B.This is joint work with Peter Bubenik.