

Topology of random geometric complexes

Omer Bobrowski*

omer@ee.technion.ac.il

A random geometric complex is an abstract simplicial complex whose vertices are generated by a random point process in a metric space, and higher-order simplexes are added according to some rules that depend on the geometric configuration of the vertices. In this talk we will review recent advances in the study of the homology of random geometric complexes. Loosely speaking, homology is a topological-algebraic structure that contains information about cycles of various dimensions in the complex. We will focus on phase transitions related to the appearance and vanishing of homology, as well the limiting distributions for the Betti numbers of these complexes. We will review different models that generate a random geometric complex, and discuss the similarities and differences in their behavior.

*Faculty of Electrical Engineering, Technion-Israel Institute of Technology, Andre and Bella Meyer Building, Haifa, 32000, ISRAEL