

# Persistent homology for certain random simplicial complexes

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Persistent homology appeared around 2000 as an algebraic method which measures topological features of objects or point cloud data. Roughly speaking, it is a time-dependent version of homology theory or homology theory for time-dependent objects. As is well-known that the 0-dimensional homology describes the situation of connected components of objects, which has been studied in detail in probability theory, especially, percolation theory, random geometric graphs and the Erdős-Rényi random graph. This suggests that analysis of higher-dimensional homology (or equivalently, higher dimensional version of connectedness) of random objects gives us a hint of how we generalize the theories mentioned above. In this talk, we will show one direction of such study by dealing with certain random processes of simplicial complexes which are natural generalizations of the Erdős-Rényi random graph process.

This talk is based on a joint work with Yasuaki Hiraoka (IMI, Kyushu Univ.)

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