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Topological Data Analysis — Persistent homology —

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Recently we have to analyze various kinds of data, for instance, point cloud/pixel/biological data, discrete/continuous data, high dimensional/big data and static/dynamic/parametrized data that are obtained in various contexts. Topological Data Analysis (TDA) is an aspect of dealing with data which is based on the belief that data admits or is affected by a certain geometric or topological structure. One of the basic tools used in TDA is persistent homology, which provides a systematic way of such analysis. The idea of persistent homology appeared quite recently (around 2000) at several places independently while the original homology theory dates back to Poincare around 1900. Thanks to the development of computer and algorithms, we are now able to compute homology and persistent homology for complicated objects.
In this talk, I would like to give a brief introduction to persistent homology and its application.