【CL1-2】

A Persistent Homological Analysis of Network Data Flow Malfunctions

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Persistent homology has recently emerged as a powerful technique in topological data analysis for analyzing the emergence and disappearance of topological features throughout a filtered space, shown via persistence diagrams. In this presentation, we develop an application of ideas from the theory of persistent homology and persistence diagrams to the study of data flow malfunctions in networks with a certain hierarchical structure. In particular, we formulate an algorithmic construction of persistence diagrams that parametrize network data flow errors, thus enabling the potential for novel applications of statistical methods that are traditionally used to assess the stability of persistence diagrams corresponding to homological data to the study of data flow malfunctions.