

Topological Data Analysis and Dynamics

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In this talk, we will discuss how tools from topological data analysis can be used to understand dynamics, with an emphasis on those known from finite samples. We will explore some standard invariants, such as persistent homology, to analyze solutions of partial differential equations [1]. Additionally, we will delve into tools at the intersection of topology and statistic [2], demonstrating how they can be used to analyze dynamical signals known from finite observations.

References

- [1] P. Dłotko, Th. Wanner, Topological microstructure analysis using persistence landscapes, *Physica D: Nonlinear Phenomena*, Volume 334, 2016.
- [2] P. Dłotko, N. Hellmer, L. Stettner, R. Topolnicki, Topology-driven goodness-of-fit tests in arbitrary dimensions, *Statistics and Computing*, 2014.