SISMA

Séminaire Informatique Scientifique & Mathématiques Appliquées

Topological Analysis of Massive Datasets

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Topological Data Analysis (TDA) is a recent area of computer science that focuses on discovering intrinsic structures hidden in data. Based on sound mathematical foundations such as Morse theory and Persistent Homology, TDA enables the robust extraction of the main features of a dataset into stable, concise, and multi-scale descriptors that facilitate data analysis and interpretation.

In this talk, I will give an intuitive overview of the main tools used in TDA, and I will illustrate their application in a concrete use-case in computational fluid dynamics. This talk will be illustrated with results produced with the "Topology ToolKit" (TTK), an open-source library (BSD license) that we develop with collaborators to showcase our research. Tutorials for re-producing these experiments are available on the TTK website: https://topology-tool-kit.github.io.