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**Learning and exploiting the shape of data : a brief
introduction to Topological Data Analysis.**

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Abstract :

Topological Data Analysis (TDA) is a recent and fast growing field whose aim is to analyze, understand and exploit the topological and geometric structure of data. With the emergence of the mathematical theory of persistent homology, computational topology and geometry have provided a set of new efficient and mathematically well-founded topological and geometric tools to achieve this goal. This talk is an introduction to a few fundamental approaches and methods, including persistent homology, to estimate relevant topological information about data and take advantage of it in further learning tasks.

We will illustrate the interest of topological approaches on a few examples coming from concrete applications.