

Topology and data

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The field of algebraic topology, a foundational pillar in mathematics, provides a plethora of insightful techniques for data analysis. In my presentation, I will delve into various strategies derived from this discipline that are beneficial to data science. Our journey will begin with an examination of classical concepts like persistent homology and mapper, then venture into tools like Euler characteristic curves and profiles, culminating with an exploration of Ball mapper and related methodologies. The core mathematical principles of these techniques will be conveyed in an easily understandable and visually illustrative manner. Furthermore, I will showcase a series of practical examples that highlight the need for integrating these algebraic topology-based approaches into contemporary data analysis scenarios.