Special Issue

Applications of Topological Data Analysis in the Life Sciences

Message from the Guest Editors

Topological data analysis (TDA) is a relatively new field of research, at the intersection of data science and algebraic topology, and it provides robust mathematical, statistical, and algorithmic methods to infer, analyze, and interpret the topological and geometric structures underlying complex data. TDA provides a set of powerful, efficient tools that can be used in combination with other data science methods. TDA techniques are applied primarily to point clouds in metric spaces, but can also be extended to geometric objects such as graphs. TDA has convincingly proved its utility in a wide range of applications in the life sciences, including in neuroscience, genomics, proteomics, evolution, and cancer biology, among other areas of research. Given these recent successes, the time is ripe for this Special Issue, devoted to surveying the remarkable insights into life sciences that have already been provided by TDA, and to explore promising new developments.

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