Special Issue

Advances in Complex Systems Modelling via Hypergraphs

Message from the Guest Editors

In the last few decades, network science has emerged as a breakthrough field in order to study and investigate complex systems. Hypergraphs overcome these limitations by allowing hyperedges to connect simultaneously more than two nodes. The greater modelling capabilities of multi-way relationships have been demonstrated in fields such as biology (e.g., protein-protein interaction networks) and social networks (e.g., collaboration networks). Yet the power of hypergraphs is not limited to a mere representation of the data. Hypergraphs and simplicial complexes also play a key role in the emergent field of topological data analysis, whose aim is to analyze a set of data (or point clouds) using techniques derived from topology and mathematics. In fact, rather than analyzing the data itself (which can be difficult due to noise, high-dimensionality, and so on), one can build a filtered set of simplicial complexes and study their properties.

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