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Information Geometry for Data Analysis

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31 May 2024

Message from the Guest Editors

Data encountered in real-world applications are often embedded in a high-dimensional space while lying intrinsically on a low-dimensional object. This is known as the "manifold hypothesis" in machine learning and is one of the keys to understand why some algorithms seem to overcome the bias-variance dilemma. Furthermore, some kind of group invariance, e.g., translation or rotation invariance, is encountered most of the time, allowing for an effective description of the data. Taking these observations into account justifies the use of techniques coming from differential geometry and topology to better understand the data. Within this frame, the Fisher metric plays a special role and underlies the concept of statistical model, a smooth Riemannian manifold endowed with this metric.

This Special Issue aims at presenting recent results relating data analysis and machine learning to geometry and topology. Theoretical papers as well as application-oriented contributions are welcomed.

- fisher metric
- dualistic structure
- manifold learning
- data manifold
- statistical manifold
- statistical model
- persistent homology

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Special Issue

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Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

Entropy is an online open access journal providing an advanced forum for the development and/or application of entropic and information-theoretic studies in a wide variety of applications. *Entropy* is inviting innovative and insightful contributions. Please consider *Entropy* as an exceptional home for your manuscript.

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