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Gaussian Fields and Their Application in Computational Engineering and Mathematical Physics

Guest Editors:

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Deadline for manuscript submissions:
15 February 2025

Message from the Guest Editors

The real world is inherently associated with uncertainty. Therefore, any digital model of a real-world phenomenon should account for these uncertainties. Probabilistic modeling, as a natural way of addressing such uncertainties, enables one to reason under uncertainty and make informed decisions in situations where complete information is unavailable. In recent years, probabilistic modeling has gained substantial attention due to the continuous increase in computing power and the growing availability of data.

Gaussian fields such as one-dimensional Gaussian processes, as a subset of probabilistic modeling, play a significant role in computational engineering. Because of their versatility and flexibility, Gaussian random fields are often employed for forecasting, surrogate modeling, and the modeling of population variability. Despite the advances made, challenges such as computational efficiency and the need for physically viable fields hinder their full potential in computational engineering and mathematical physics. This Special Issue aims to address these theoretical challenges as well as various applications of Gaussian processes.

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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.

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