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Complexity, Entropy and the Physics of Information, 2nd Edition

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Message from the Guest Editors

With the rapid development of artificial intelligence (AI) techniques, complexity and entropy play important roles, often influencing the design, performance, and understanding of AI systems. Complexity is crucial for developing models that generalize well to unseen data. Entropy, as a measure of uncertainty, helps in understanding and quantifying the reliability of AI predictions. Balancing complexity and entropy is an ongoing challenge, and various techniques and methodologies are employed to strike an optimal balance for effective and reliable AI systems.

This Special Issue focuses on recent advances in the theories and methods in complexity science and statistical physics and their applications in understanding and analyzing information and AI systems in various scientific disciplines encompassing computer science, physics, biomedicine, management, economics, and more.

Keywords: information systems; neural networks; information theory; complexity theory; statistical physics; complex networks; complexity and entropy in AI; data-driven modelling; machine learning and deep learning; time-series analysis

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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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