Special Issue Reprint

Information-Theoretic Methods in Deep Learning: Theory and Applications

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Edited by
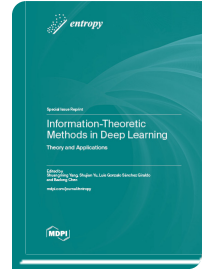Shuangming Yang
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The rapid development of deep learning has led to groundbreaking advancements across various fields, from computer vision to natural language processing and beyond. Information theory, as a mathematical foundation for understanding data representation, learning, and communication, has emerged as a powerful tool in advancing deep learning methods.

This Special Issue, "Information-Theoretic Methods in Deep Learning: Theory and Applications", presents cutting-edge research that bridges the gap between information theory and deep learning. It covers theoretical developments, innovative methodologies, and practical applications, offering new insights into the optimization, generalization, and interpretability of deep learning models. The collection includes contributions on:

Theoretical frameworks combining information theory with deep learning architectures;

Entropy-based and information bottleneck methods for model compression and generalization;

Mutual information estimation for feature selection and representation learning;

Applications of information-theoretic principles in natural language processing, computer vision, and neural network optimization.

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