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The Information Bottleneck in Deep Learning

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Deadline for manuscript submissions:

closed (30 November 2019)

Message from the Guest Editors

The Information Bottleneck is a principle to trade off complexity and fidelity in statistical modeling and inference. It was introduced in the 1990s and has been applied to different domains such as clustering and system identification. Most recently, it has shown to play a role in the analysis of deep neural networks. This Special Issue focuses on the role of the Information Bottleneck and related principles in the analysis and design of representation learning and optimization algorithms for training deep neural networks. For instance, connections have been established between the Information Bottleneck and Bayesian Inference, PAC-Bayes Theory, Kolmogorov Complexity, and Minimum-Description Length—all with different algorithmic instantiation. Contributions are solicited that explore both the modeling aspect, the optimization aspect, and the empirical analysis aspect of deep learning using tools from Information Theory and Statistical Theory. Manuscripts published at conferences are welcome, so long as they include meaningful expansion.



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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.

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