

Special Issue

The Information Bottleneck in Deep Learning

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.

Guest Editors

Prof. Dr. Naftali Tishby

The School of Computer Science and Engineering and the Interdisciplinary Center for Neural Computation, The Hebrew University of Jerusalem, Jerusalem 9190401, Israel

Prof. Dr. Stefano Soatto

Professor Of Computer Science, UCLA, Boelter Hall 3531d, 405 Hilgard Ave, Los Angeles, CA 90095-1596, USA

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Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
entropy@mdpi.com

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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.

Editor-in-Chief

Prof. Dr. Kevin H. Knuth

Department of Physics, University at Albany, 1400 Washington Avenue,
Albany, NY 12222, USA

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