Special Issue

The Information Bottleneck Method: Theory and Applications

Message from the Guest Editors

This Special Issue will explore both the theoretical foundations and practical applications of the IB principle. On the theoretical side, we invite works that deepen the understanding of IB in relation to generalization, optimization, and its connections to rate–distortion theory. On the methodological side, we welcome contributions that leverage IB for loss function design, training algorithms, and architecture development, highlighting its ability to improve both robustness and explainability of deep learning models. Finally, we particularly encourage submissions showcasing applications of IB in emerging areas such as deep reinforcement learning, self-supervised learning, multimodal learning, and learning on graph data, while also welcoming broader applications in machine learning, signal processing, and other engineering domains. By consolidating the latest ideas across disciplines, this Special Issue aims to advance the state of knowledge on the information bottleneck method and inspire new directions at the interface of information theory and artificial intelligence.

Guest Editors

Dr. Shujian Yu

Department of Computer Science, Vrije Universiteit Amsterdam, 1081 HV Amsterdam, The Netherlands

Prof. Dr. Robert Jenssen

UiT—The Arctic University of Norway, 9037 Tromsø, Norway

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Entropy
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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