



Information Transfer in Multilayer/Deep Architectures

Guest Editors:

Prof. Dr. Vincent Vigneron

Informatique Biologie Intégrative
et Systèmes Complexes,
Université d'Évry-Val-d'Essonn,
Évry, France

Prof. Dr. Hichem Maaref

Informatique Biologie Intégrative
et Systèmes Complexes,
Université d'Évry-Val-d'Essonn,
Évry, France

Deadline for manuscript
submissions:

closed (15 July 2020)

Message from the Guest Editors

The renewal of research interest in machine learning came with the emergence of the concept of big data during the late 2000s. Schematically, families of deep learning networks (DLN) emerged with industrial ambitions, taking advantage of the development of graphics cards (GPUs) to construct prediction models from massive amounts of collected and stored data and substantial means of calculation. It is illusory to want to learn a deep network involving millions of parameters without very large databases. We tend to think that more data lead to more information. In addition, the core of learning is all but a problem of data representation, not in the 'data compression' sense. For instance, in DLN, one representation (input layer) is replaced by a cascade of many representations (hidden layers), which means an increase of information (entropy). However, some questions remain:

- How does information spread in these inflationary networks?
- Is information transform conservative through the DLN?
- Can information theory quantify the learning capacity of these networks?
- How do generative models convert information from the observed space to the hidden space?





an Open Access Journal by MDPI

Editor-in-Chief

Prof. Dr. Kevin H. Knuth

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

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.

Author Benefits

Open Access: free for readers, with [article processing charges \(APC\)](#) paid by authors or their institutions.

High Visibility: indexed within [Scopus](#), [SCIE \(Web of Science\)](#), [Inspec](#), [PubMed](#), [PMC](#), [Astrophysics Data System](#), and [other databases](#).

Journal Rank: JCR - Q2 (*Physics, Multidisciplinary*) / CiteScore - Q1 (Mathematical Physics)

Contact Us

Entropy Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
www.mdpi.com

mdpi.com/journal/entropy
entropy@mdpi.com
[X@Entropy_MDPI](https://twitter.com/Entropy_MDPI)