Special Issue

Information-Theoretic Methods in Computational Neuroscience

Message from the Guest Editors

We welcome original research and reviews that focus on the role of information theory in neuroscience in any way, shape, or form. Examples of topics that may be of interest include:

- The inference and usage of maximum entropy models and stimulus-dependent maximum entropy models;
- The estimation, usage, and interpretation of information-theoretic quantities to benchmark how well neural systems communicate information;
- The development of novel information-theoretic quantities for understanding neural systems;
- Explorations of criticality in neural systems, including optimal information processing capabilities and their connection to criticality and its connection to partial information decomposition and other novel information-theoretic quantities;
- New methods for the estimation of information-theoretic quantities or objectives that pertain to neural systems, particularly those methods that scale to high-dimensional data;
- Information-theoretic normative theories such as rate-distortion theory and its variants or noisy constrained channel coding to understand neural systems, especially in the style of the efficient coding hypothesis.

Guest Editors

Dr. Sarah Marzen

Prof. Dr. John Beggs

Dr. Martina Lamberti

Dr. Jared Salisbury

Deadline for manuscript submissions

closed (20 November 2025)

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About the Journal

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

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