Special Issue

The Role of Signal Processing and Information Theory in Modern Machine Learning

Message from the Guest Editors

Breakthroughs in modern machine learning are rapidly changing science, industry, and society, yet fundamental understanding in this area has lagged behind. For example, one of the central tenets of the field, the bias–variance trade-off, appears to be at odds with the observed behavior of methods used in practice and the black-box nature of deep neural network architectures defies explanation. As these technologies are integrated more and more deeply into devices and services used by millions of people worldwide, there is an urgent need to provide theoretical guarantees for machine-learning techniques and to explain why and how these techniques work, based on empirical observation.This Special Issue aims to be a forum for the presentation of new and improved techniques at the intersection of Signal Processing, Information Theory, Statistical Mechanics, and Machine Learning. In particular, the theory of deep learning, novel uses of signal processing and information theory in machine learning, explainable deep learning, as well as active and adversarial learning fall within the scope of this Special Issue.

Guest Editors

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Deadline for manuscript submissions

closed (30 November 2020)

Entropy

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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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