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Application of Entropy to Computer Vision and Medical Imaging

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Message from the Guest Editors

Shannon entropy is initially devoted to quantifying the minimum bits necessary to encode a signal without loss of information; it represents the asymptotic limit of the compression ratio in the Huffman algorithm. Moreover, Shannon entropy is linked to the amount of disorder in random signals. Since Shannon's work, generalizations of entropy (Rényie, Havrda–Charvat) as well as various applications have emerged. In statistics, as well as in machine learning, different entropies have been used to model uncertainty in data and in parameter estimation and can be also used to evaluate the amount of information in data. From entropies, one can define divergences which are used as "distances" between probability distributions. In deep learning, these entropies are usually used as loss functions for probabilistic neural networks.

This Special Issue is devoted to applications of probabilistic neural networks for computer vision and medical image analysis.

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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.

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