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Title: Data that “make sense”

A definition of learning as “making sense of data that make sense” requires an absolute quantitative notion of relevance, that is independent of what is to be learned and how. We have recently proposed [1] one such notion, based on information theoretic arguments, which applies both to data and representations, thus allowing one to define maximally informative samples and optimal learning machines in a context independent manner. This approach to learning clarifies the relation between “making sense” and criticality and that Gaussian data is necessarily structureless, it provides new approaches to high-dimensional inference in the under-sampling regime and guiding principles for the design of machine learning architectures [2].

[1] M Marsili, Y Roudi, Quantifying relevance in learning and inference. *Physics Reports* 963, 1-43 (2022)

[2] R Xie, M Marsili, Occam learning. arXiv preprint arXiv:2210.13179 (2023)