Complexity priors vs. complexity costs

Jörg C. Lemm*
Center for Biological and Computational Learning
Massachusetts Institute of Technology
Cambridge, MA 02142
lemm@ai.mit.edu

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Abstract

Complexity of a model can enter a formalism through priors or costs. For example, a sparsity constraint used for code construction can come from the knowledge that examples are generated by only a few example generating protoypes or from numerical reasons related to application of the code. In a general Bayesian framework both aspects can be modeled independently. But empirical risk minimization implements complexity constraints as costs while interpreting the same numerical procedure as a Bayesian maximum posterior approximation those terms appear as priors. Only for uniform priors or costs both interpretations coincide. It is discussed how also in the framework of a maximum posterior approximation both aspects can be implemented independently.

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