Maximizing Multi–Information

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Abstract: Stochastic interdependence of a probability distribution on a product space is measured by its Kullback–Leibler distance from the exponential family of product distributions (called multi-information). Here we investigate low-dimensional exponential families that contain the maximizers of stochastic interdependence in their closure.

Based on a detailed description of the structure of probability distributions with globally maximal multi-information we obtain our main result: The exponential family of pure pair-interactions contains all global maximizers of the multi-information in its closure.