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Convergent and Scalable Algorithms for Expectation Propagation Approximate Bayesian Inference

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Abstract:

The expectation propagation (or adaptive TAP) relaxation stands out among variational relaxations of Bayesian inference, when it comes to generality and accuracy of results. It is widely used in machine learning today. Applied to large scale continuous variable models for inverse problems in imaging and computer vision, commonly used solvers lack convergence proofs and are too slow to be useful. In this talk, we describe a novel EP algorithm which is both provably convergent and can be scaled up to large densely connected models, drawing a connection between the double loop algorithm of Opper and Winther (JMLR 2005) and earlier work by the author on scalable algorithms for simpler relaxations.

Partly joint work with Hannes Nickisch.