High-dimensional non-Gaussian Bayesian inference using transport maps

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ABSTRACT

Characterizing high-dimensional posterior distributions in the context of nonlinear and non-Gaussian Bayesian inverse problems is a challenging task. A recent approach to this problem seeks a deterministic transport map from a reference distribution to the posterior. Thus posterior samples can easily be obtained by pushing forward reference samples through the map, or posterior expectations may be evaluated through quasi-Monte Carlo methods, tensor methods, or sparse quadrature. In this talk, we address the computation of the transport map in high dimensions. In particular, we propose a scalable adaptive algorithm that exploits recent ideas in dimensionality reduction for Bayesian inverse problems.