THE UNIVERSITY OF CHICAGO

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STATISTICS COLLOQUIUM

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On Polynomial-Time Computation of High-Dimensional Posterior Measures by Langevin-Type Algorithms

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Via Zoom (session information will be e-mailed to subscribers)

ABSTRACT

The problem of generating random samples of high-dimensional posterior distributions arising from Gaussian process priors is considered. The main results consist of non-asymptotic computational guarantees for Langevin-type MCMC algorithms which scale polynomially in key quantities such as the dimension of the model, the desired precision level, and the number of available statistical measurements. It is shown that posterior mean vectors as well as maximum a posteriori (MAP) estimates are computable in polynomial time, with high probability under the distribution of the data. The results are derived in a general high-dimensional non-linear regression setting where posterior measures are not necessarily log-concave. The theory is illustrated in an example from PDEs involving a non-linear inverse problem for the steady-state Schrödinger equation.

This talk is based on the preprint https://arxiv.org/abs/2009.05298
