THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS STUDENT SEMINAR

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Unified Convergence Results for Sequential Monte Carlo

THURSDAY, February 8, 2018, at 1:00 PM
Jones 226, 5747 South Ellis Avenue

ABSTRACT

Sequential Monte Carlo (SMC) is a numerical algorithm used to compute high-dimensional expectations involving a Markov chain. Asymptotic convergence rates have been established for some common variants of SMC; however, a systematic comparison of resampling schemes has not been completed. Here, asymptotic convergence rates are obtained using a unified analytic framework, inspired by Whiteley et al. (2016). The framework facilitates comparison of a diversity of resampling schemes, including Bernoulli resampling, multinomial resampling, stratified resampling, and resampling with bins. As a general principle, SMC schemes are shown to converge most quickly when each particle is resampled from a subset of particles as similar to one another as possible.

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