

Computational aspects of sequential Monte Carlo filter and smoother

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Abstract Progress in information technologies has enabled to apply computer-intensive methods to statistical analysis. In time series modeling, sequential Monte Carlo method was developed for general nonlinear non-Gaussian state-space models and it enables to consider very complex nonlinear non-Gaussian models for real-world problems. In this paper, we consider several computational problems associated with sequential Monte Carlo filter and smoother, such as the use of a huge number of particles, two-filter formula for smoothing, and parallel computation. The posterior mean smoother and the Gaussian-sum smoother are also considered.

Keywords Nonlinear non-Gaussian state-space model · Particle filter · Gaussian-sum filter · Two-filter formula · Parallel computation · Posterior mean smoother