Particle Filtering and Learning

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Abstract

Particle filtering and learning algorithms for general state space models are developed. Our approach exactly samples from a particle approximation to the joint posterior distribution of both parameters and latent states. We illustrate the efficiency of our approach in a number of models: robust filtering including quantile models, t-errors, Cauchy and Meridian errors; stochastic volatility jump diffusions. Robustness in both the observation and state equation is easily accommodated together with parameter learning. An application to stochastic volatility jump models for stock index return data is described.

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