
Particle filtering subject to interaction constraints*

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Abstract

Particle filters are very flexible algorithms for inferential computation in non-linear, non-Gaussian state-space models. The potential benefits of parallel and distributed implementation of particle filters motivates study of their interaction structure, especially the "resampling" step, in which particles interact through a genetic-type selection, which is usually the bottleneck for parallelization. Can we do away with resampling, or at least re-structure it in such a way as to be more naturally suited to non-serial implementation? What role does resampling really play in endowing these algorithms with attractive properties? This talk will introduce some new algorithms and discuss properties of existing ones, in this context.

Joint work with Kari Heine (UCL) and Anthony Lee (Warwick). Preprint of the first part: <http://arxiv.org/abs/1505.02390>.