

Particle Learning Group

Hedibert F. Lopes and Carlos M. Carvalho

Week 2 Summary Report

PL in Econometrics and Finance

- In the second meeting we have talked extensively about Liu and West's (2001) paper.
- Group members should try to relate to one or several of the sub-groups listed below.

Kernel smoothing

Choice of alternative kernel smoothers to move particles from $p(\theta|D_t)$ to $p(\theta|D_{t+1})$.

- One discount per group of parameters? One for location parameters and one for scale parameters, for instance. Or, one for highly correlated parameters and another one for almost uncorrelated parameters?
- What transformation from constrained parameters to unconstrained parameters? What are the effects on sequential learning and on the sufficient statistics, if any?
- Kernel smoothing combining normal, exponential, gamma and other components;
- Kernel smoothing resembling the prior structure.

AR(p)

Autoregressive processes with structured priors.

- Primary reference: Huerta and West (1999) Priors and component structures in autoregressive time series models. *JRSS-B*, **61**, 881-99.
- Christian will talk about research with Brunero Liseo on objective Bayes for AR(p) models with $p > 1$.
- Liu and West's learning scheme in this context.

Long memory

Long memory time series process.

- AR representation, approximation and sequential learning
- Time series hierarchically linked in the frequency-domain: multiple EEG channels, for example.
- Read Comets, Fernandez and Ferrari's paper on "Processes with long memory: regenerative construction and perfect simulation" and find possible connections with sequential monte carlo schemes.

Parameter estimation DSGE

Computing $p(y|\theta) = \int p(y|\theta, x)p(x|\theta)dx$ in dynamic stochastic general equilibrium (DSGE) models

- Reread Rubio-Ramirez's paper on "The New Macroeconometrics: An Introductory Review";
- Reread De Jong's discussion of the session on *Applications in Economics and Decision Making*. and De Jong *et al* (2007) "An efficient approach to analyzing state-space representations"
<http://www.pitt.edu/~dejong/eisparticle.htm>