ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

ΣΧΟΛΗ ΕΠΙΣΤΗΜΩΝ & ΤΕΧΝΟΛΟΓΙΑΣ ΤΗΣ ΠΛΗΡΟΦΟΡΙΑΣ
SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY

ΤΜΗΜΑ ΣΤΑΤΙΣΤΙΚΗΣ
DEPARTMENT OF STATISTICS

ΚΥΚΛΟΣ ΣΕΜΙΝΑΡΙΩΝ ΣΤΑΤΙΣΤΙΚΗΣ ΜΑΙΟΣ 2017

Κώστας Καλογερόπουλος

Associate Professor, Department of Statistics, London School of Economics

Sequential and Hybrid Monte Carlo for continuous time stochastic volatility models with memory

ΠΕΜΠΤΗ 25/5/2017
12:15

ΑΙΘΟΥΣΑ 607, 6ος ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)

ΠΕΡΙΛΗΨΗ

We consider continuous-time stochastic volatility models driven by fractional Brownian motion. Due to the non-Markovianity and high-dimensionality of the latent paths, estimating posterior expectations is a computationally challenging undertaking. We present a re-parameterisation framework based on the Davies and Harte method for sampling stationary Gaussian processes and use this framework to construct a hybrid Monte Carlo algorithm that allows computationally efficient Bayesian inference despite the high-dimensional latent variables arising in this context. The hybrid Monte Carlo algorithm can either be used on its own or undertake the task of the rejuvenation step in a sequential Monte Carlo algorithm. The latter not only allows a more robust computational scheme, but also offers a model choice framework that can be based on either i) the marginal likelihood estimates or ii) model predictive performance through the sequences of posterior predictive distributions. The methodology is illustrated on both simulated data and the S&P500 time series.

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DEPARTMENT OF STATISTICS

AUEB STATISTICS SEMINAR SERIES MAY 2017

Kostas Kalogeropoulos

Associate Professor, Department of Statistics, London School of Economics

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THURSDAY 25/5/2017
12:15

ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)

ABSTRACT

We consider continuous-time stochastic volatility models driven by fractional Brownian motion. Due to the non-Markovianity and high-dimensionality of the latent paths, estimating posterior expectations is a computationally challenging undertaking. We present a re-parameterisation framework based on the Davies and Harte method for sampling stationary Gaussian processes and use this framework to construct a hybrid Monte Carlo algorithm that allows computationally efficient Bayesian inference despite the high-dimensional latent variables arising in this context. The hybrid Monte Carlo algorithm can either be used on its own or undertake the task of the rejuvenation step in a sequential Monte Carlo algorithm. The latter not only allows a more robust computational scheme, but also offers a model choice framework that can be based on either i) the marginal likelihood estimates or ii) model predictive performance through the sequences of posterior predictive distributions. The methodology is illustrated on both simulated data and the S&P500 time series.