

2,649 178

Views

CrossRef citations to date

9

Altmetric

Original Articles

A Survey of Sequential Monte Carlo Methods for Economics and Finance

Drew Creal

Pages 245-296 | Published online: 28 Nov 2011

Cite this article <https://doi.org/10.1080/07474938.2011.607333>

Sample our
Mathematics & Statistics
Journals

>> [Sign in here](#) to start your access
to the latest two volumes for 14 days

Full Article

Figures & data

References

Citations

Metrics

Reprints & Permissions

[Read this article](#)

Abstract

This article serves as an introduction and survey for economists to the field of sequential Monte Carlo methods which are also known as particle filters. Sequential Monte Carlo methods are used in a wide range of applications, including high-dimensional dynamic models, stochastic volatility, and dynamic factor models. The objective of this article is to provide a comprehensive survey of the methods in this field.

We Care About Your Privacy

We and our 842 partners store and/or access information on a device, such as unique IDs in cookies to process personal data. You may accept or manage your choices by clicking below, including your right to object where legitimate interest is used, or at any time in the privacy policy page. These choices will be signaled to our partners and will not affect browsing data. [Privacy Policy](#)

We and our partners process data to provide:

Use precise geolocation data. Actively scan device characteristics for identification. Store and/or access information on a device. Personalised advertising and content, advertising and content measurement, audience research and services development.

[List of Partners \(vendors\)](#)

I Accept

Essential Only

Show Purpose



Keyword

State space

JEL Clas

ACKNOWLEDGMENTS

I would like to thank Charles Bos, Siem Jan Koopman, Michael Massmann, Herman van Dijk, Eric Zivot, participants at the Emerging Methods in Bayesian Econometrics Workshop at Erasmus Universiteit Rotterdam, and two anonymous referees for constructive comments. I would also like to acknowledge financial support from the Grover and Creta Ensley Fellowship, which funded part of this research while I was a graduate student at the University of Washington. All the computations reported in this article were carried out using the OxMetrix 6.0 programming environment of Doornik ([2009](#)). Ox and some Matlab code are available upon request from the author.

Notes

¹The residual and systematic resampling schemes are also known in the genetic algorithm literature under alternative names, see Whitley ([1994](#)).

²Matlab code for each of the resampling algorithms can be found at Nando de Freitas' webpage at <http://www.cs.ubc.ca/~nando/software.html>.

³The squared coefficient of variance CV^2 is equal to the estimator of the asymptotic variance for the self-normalized IS estimator (see Geweke, [1989](#), [2005](#)), where the function being integrated is equal to one, i.e., $f(x_{0:n}) = 1$.

⁴Keep in mind that $p_n(x_n | x_{n-1}, Y_n)$ is the proposal density.

⁵For example, the variance of the estimator in equation (42) will remain bounded.

- a. For $\alpha < 1$,
- b. For $\alpha = 1$,
- c. For $\alpha > 1$,

where X is a random variable.

⁶In a stationary regime, the variance of the estimator is analogous to the variance of the estimator in equation (42).

Related research

People also read

Recommended articles

Cited by
178

Information for

- Authors
- R&D professionals
- Editors
- Librarians
- Societies

Opportunities

- Reprints and e-prints
- Advertising solutions
- Accelerated publication
- Corporate access solutions

Open access

- Overview
- Open journals
- Open Select
- Dove Medical Press
- F1000Research
- Help and information
- Help and contact
- Newsroom
- All journals
- Books

Keep up to date

Register to receive personalised research and resources by email



Sign up



Copyright

Access

Registered
5 Howick Pl

Wiley
John Wiley & Francis Group
a John Wiley & Francis business

