

**Iacus, Stefano M.**

**Simulation and inference for stochastic differential equations. With R examples.** (English)

Zbl 1210.62112

Springer Series in Statistics. New York, NY: Springer (ISBN 978-0-387-75838-1/hbk). xviii, 284 p. (2008).

Diffusion processes, described by stochastic differential equations (SDEs), are extensively applied in many areas of scientific research. This book focuses on simulation techniques and parameter estimation for SDEs. It gives an overview of these topics through a mix of simplified theory and examples. The book is written in a way to be suitable for the beginner and the advanced reader who want to know about new directions in numerics or inference.

The book starts with the basic theory of stochastic processes and SDEs. Some introductory material on simulation is also included. Numerical methods for SDEs are discussed next. The chapter on parameter estimation introduces some novel techniques for inference. There is also a small chapter on miscellaneous topics which contains the Akaike information criterion, nonparametric estimation and change-point estimation. Essentially all examples are complemented by program codes in R. The appendix presents a brief excursion into R and a description of the R-functions that are used throughout the book.

Reviewer: [Rainer Schlittgen \(Hamburg\)](#)

**MSC:**

- [62M05](#) Markov processes: estimation; hidden Markov models
- [60H10](#) Stochastic ordinary differential equations (aspects of stochastic analysis)
- [65C60](#) Computational problems in statistics (MSC2010)
- [65C50](#) Other computational problems in probability (MSC2010)
- [62-01](#) Introductory exposition (textbooks, tutorial papers, etc.) pertaining to statistics
- [62-02](#) Research exposition (monographs, survey articles) pertaining to statistics
- [62M99](#) Inference from stochastic processes

Cited in **2** Reviews  
Cited in **61** Documents

**Software:**

ISwR; S-PLUS; sde; R