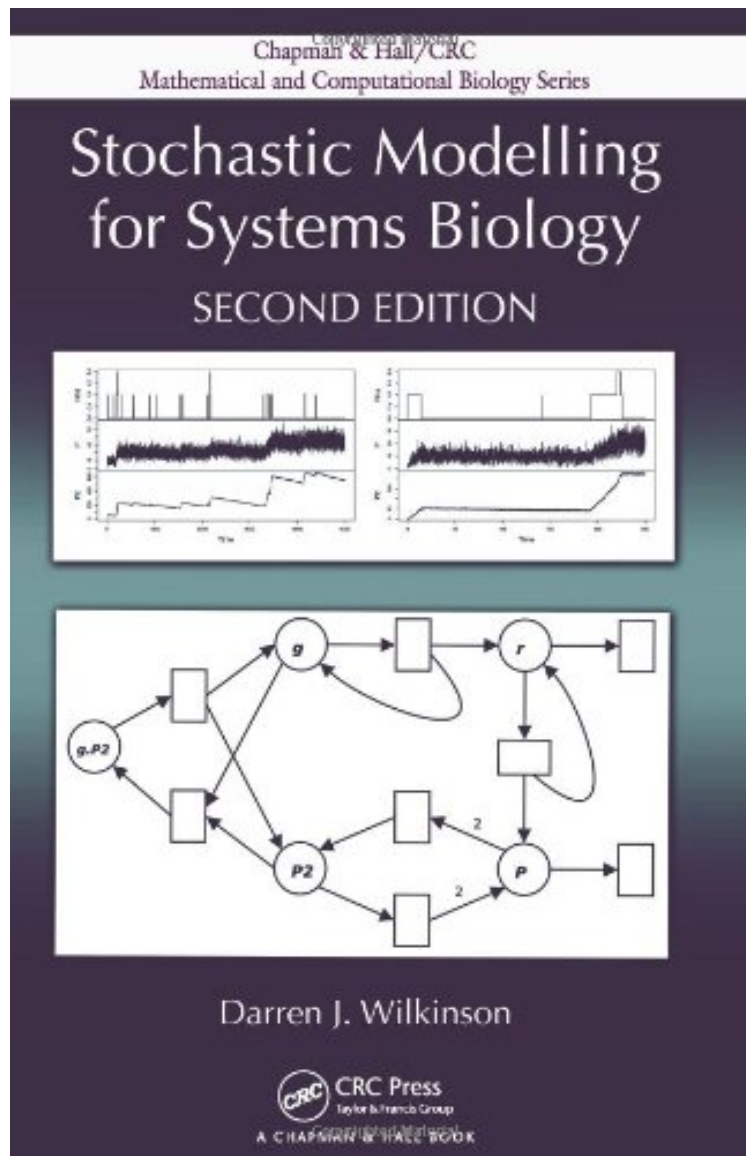


(Ebook pdf) Stochastic Modelling for Systems Biology, Second Edition (Chapman Hall/CRC Mathematical and Computational Biology)

Stochastic Modelling for Systems Biology, Second Edition (Chapman Hall/CRC Mathematical and Computational Biology)

Darren J. Wilkinson

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Darren J. Wilkinson : Stochastic Modelling for Systems Biology, Second Edition (Chapman Hall/CRC Mathematical and Computational Biology) before purchasing it in order to gage whether or not it would be worth my time, and all praised Stochastic Modelling for Systems Biology, Second Edition (Chapman Hall/CRC Mathematical and Computational Biology):

0 of 0 people found the following review helpful. Four StarsBy ESMGood book but pricy!25 of 30 people found the following review helpful. Correct title: Stochastic modeling of biological systemsBy Abstract SpaceThis is one of several recent books with system biology in the title, but first book with emphasis on statistics and stochastic approach. The book discusses some simple math models for biological systems, mostly biochemical models. Main focus is on statistical issues in differential modeling, those as discussed in the nice Bower and Bolouri (2000) book Computational Modeling of Genetic and Biochemical Networks (Computational Molecular Biology), and the strong point is the use of Bayesian Markov chain Monte Carlo method for stochastic modeling. Weakness is that, the systems considered are too low-dimensional, and there is a long way toward real system biology issues, which will likely be much more complex, and involve potentially many high-dimensional interactions. Overall, it is simply a very straightforward introductory book, lacks depth and breadth. However, it should serve as a good starting point for people who want to learn something about stat and probabilistic methods relevant to bios system modelling.

Since the first edition of Stochastic Modelling for Systems Biology, there have been many interesting developments in the use of "likelihood-free" methods of Bayesian inference for complex stochastic models. Re-written to reflect this modern perspective, this second edition covers everything necessary for a good appreciation of stochastic kinetic modelling of biological networks in the systems biology context. Keeping with the spirit of the first edition, all of the new theory is presented in a very informal and intuitive manner, keeping the text as accessible as possible to the widest possible readership. New in the Second Edition All examples have been updated to Systems Biology Markup Language Level 3 All code relating to simulation, analysis, and inference for stochastic kinetic models has been re-written and re-structured in a more modular way An ancillary website provides links, resources, errata, and up-to-date information on installation and use of the associated R package More background material on the theory of Markov processes and stochastic differential equations, providing more substance for mathematically inclined readers Discussion of some of the more advanced concepts relating to stochastic kinetic models, such as random time change representations, Kolmogorov equations, Fokker-Planck equations and the linear noise approximation Simple modelling of "extrinsic" and "intrinsic" noise An effective introduction to the area of stochastic modelling in computational systems biology, this new edition adds additional mathematical detail and computational methods that will provide a stronger foundation for the development of more advanced courses in stochastic biological modelling.

"Each chapter is completed by some training exercises. In order to satisfy more curious or more advanced readers, the author also proposes further readings in a dedicated section for each chapter, which is in my opinion a really good idea: highlighting a selection of interesting readings is much less disheartening than referring to a bibliography at the end of the book. Note that the book is supplemented by a quite complete website. the book has been enhanced by an introduction to approximate Bayesian computation, the codes have been updated to SBML Level 3, and the chapters on Markov chains and stochastic differential equations have been reinforced. a really comprehensible and easy-to-read course."Sophie Donnet, Universit Paris-Dauphine, CHANCE, 25.4 Praise for the First Edition:"designed and well suited as an in-depth introduction into stochastic chemical simulation, both for self-study or as a course text"Biomedical Engineering Online, December 2006About the AuthorDarren Wilkinson is Professor of Stochastic Modelling at Newcastle University in the UK. He was educated at the nearby University of Durham, where he took his first degree in Mathematics, followed by a Ph.D. in Bayesian statistics which he completed in 1995. He moved to a lectureship in statistics at the Newcastle University in 1996, where he has remained since, being promoted to his current post in 2007. Professor Wilkinson is interested in computational statistics and Bayesian inference and in the application of modern statistical technology to problems in statistical bioinformatics and systems biology. He is involved in a variety of systems biology projects at Newcastle, including the Centre for Integrated Systems Biology of Ageing and Nutrition (CISBAN). He recently held a BBSRC Research Development Fellowship on Integrative modelling of stochasticity, noise, heterogeneity and measurement error in the study of model biological systems.