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Markov Chains And Stochastic Stability (Cambridge Mathematical Library)

Markov Chains and Stochastic Stability

SECOND EDITION

$$\|P^n(x, \cdot) - \pi\|_f \to 0$$

$$\pi(S) < \infty$$

$$\sup_{c} E_x[S_{\tau_c}(f)] < \infty$$

$$\Delta V(x) \leq -f(x) + b\mathbb{1}_C(x)$$

Sean Meyn and Richard L. Tweedie

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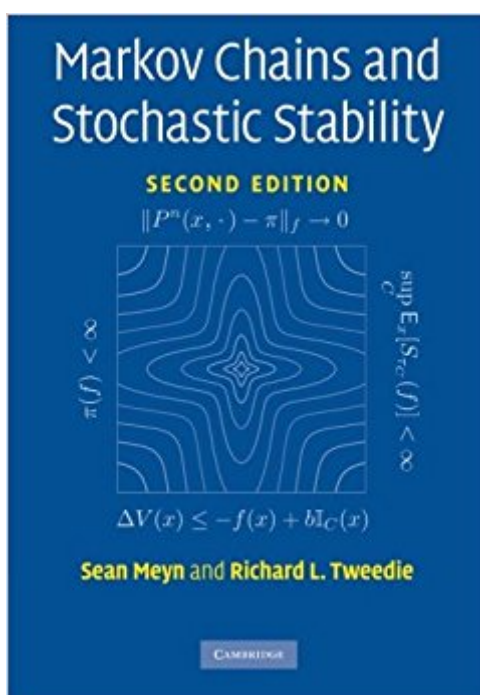
Synopsis

Meyn and Tweedie is back! The bible on Markov chains in general state spaces has been brought up to date to reflect developments in the field since 1996 - many of them sparked by publication of the first edition. The pursuit of more efficient simulation algorithms for complex Markovian models, or algorithms for computation of optimal policies for controlled Markov models, has opened new directions for research on Markov chains. As a result, new applications have emerged across a wide range of topics including optimisation, statistics, and economics. New commentary and an epilogue by Sean Meyn summarise recent developments and references have been fully updated. This second edition reflects the same discipline and style that marked out the original and helped it to become a classic: proofs are rigorous and concise, the range of applications is broad and knowledgeable, and key ideas are accessible to practitioners with limited mathematical background.

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Customer Reviews

"As Glynn puts it in his prologue, "This second edition remains true to the remarkable standards of scholarship established by the first edition... This new edition does a splendid job of making clear the most important [new] developments and pointing the reader in the direction of key references to be studied in each area." The reviewer fully agrees with this assessment." M. Iosifescu, Mathematical Reviews"The second edition of Meyn and Tweedie's Markov Chains and Stochastic Stability is out. This is great news. If you do not have this book yet, you should hurry up and get

yourself a copy at a very reasonable price, and if you do own a copy already, it is probably falling apart by now from frequent use, so upgrade to the second edition." Gennady Samorodnitsky, Journal of the American Statistical Association

New up-to-date edition of this influential classic on Markov chains in general state spaces. Proofs are rigorous and concise, the range of applications is broad and knowledgeable, and key ideas are accessible to practitioners with limited mathematical background. New commentary by Sean Meyn, including updated references, reflects developments since 1996.

It is certainly great news for researchers working with Markov chains that this widely used book got reprinted with a new publisher. The content is almost the same as the first version, except for some notes and bibilographic updates by the second author and a nice foreward by Peter Glynn. Of course, sadly the first author is no longer with us today, and the second author has done a good job of putting a modern touch to the book. I think Markov chain theory is still of interest today for at least two reasons. First, Markov models seem to have more and more applications everyday, from modern cummunication networks to molecular biological data analysis, and so it pays to have a grasp and some understanding of the basic properties of concrete models, whether being stable, or being sensitive to parameter perturbations. This book provides a good introduction and foundation for understanding stochastic dynamical systems. Secondly, there is an intrinsic need in statistical theory for Markov chain model, as it is perhaps the simplest and most natural model for dependence in data, generalizing standard evolution equations such as ODE or PDE models in the sciences literature. For example, both time series analysis and Bayesian statistical computation make heavy use of Markov chain theory. I think this book should be taught at the graduate level at most major statistics departments. This book makes an interesting comparison to another classic book on this subject: E. Nummelin's bookGeneral Irreducible Markov Chains and Non-Negative Operators (Cambridge Tracts in Mathematics)Ã Â which is, often, overlooked and under-appreciated. This book came out at a perfect time in the early 90s when Markov chain Monte Carlo is just about to take off in statistics, and so its very readable style has found very wide readership in both statistics and OR communities. On the other hand, Nummelin's book is an excellent book for mathematicians, though I would like to see more explanations and examples to illustrate the abstract theory. I still would like to see the Markov chain theory be developed further, such as some of the stability criteria could have been further relaxed to the limits, such as by use of Lyapunov exponents. When the book first came out, I found some examples in the book very interesting for my research on noisy

chaos in the early stage of my career. I raised a few questions, especially in relation to chaos and Lyapunov exponents. I'm happily surprised that the authors have even remembered me and acknowledged it in this new edition after so many years. I still wish to benefit more from this book now that I have a personal copy of the book in its modern form and hope to understand long term behaviors of many complicated processes such as Markov switching processes.

good book.

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