Discrete-Time Markov Chains: Two-Time-Scale Methods and Applications (Stochastic Modelling and Applied Probability)

This book focuses on two-time-scale Markov chains in discrete time. Our motivation stems from existing and emerging applications in optimization and control of complex systems in manufacturing, wireless communication, and ?nancial engineering. Much of our e?ort in this book is devoted to designing system models arising from various applications, analyzing them via analytic and probabilistic techniques, and developing feasible compu- tionalschemes. Ourmainconcernistoreducetheinherentsystemcompl- ity. Although each of the applications has its own distinct characteristics, all of them are closely related through the modeling of uncertainty due to jump or switching random processes. Oneofthesalientfeaturesofthisbookistheuseofmulti-timescalesin Markovprocessesandtheirapplications. Intuitively,notallpartsorcom- nents of a large-scale system evolve at the same rate. Some of them change rapidly and others vary slowly. The di?erent rates of variations allow us to reduce complexity via decomposition and aggregation. It would be ideal if we could divide a large system into its smallest irreducible subsystems completely separable from one another and treat each subsystem indep- dently. However, this is often infeasible in reality due to various physical constraints and other considerations. Thus, we have to deal with situations in which the systems are only nearly decomposable in the sense that there are weak links among the irreducible subsystems, which dictate the oc- sional regime changes of the system. An e?ective way to treat such near decomposability is time-scale separation. That is, we set up the systems as if there were two time scales, fast vs. slow. xii Preface Followingthetime-scaleseparation,weusesingularperturbationmeth- ology to treat the underlying systems.

Average-Cost Control of Stochastic Manufacturing Systems - Google Books Result From the timeseries of an observable, we construct a discrete-in-time Markov chain and calculate the eigenspectrum of its transition probability (or stochastic) matrix. see [1,2] continuous-time Markov chains are treated in detail in [3]). . from applications: one timeseries generated by a model simulating the dynamics of **Control Techniques for Complex Networks - Google Books Result** Publisher: Society for Industrial and Applied Mathematics (2015) Reduction of Markov chains with two-time-scale state transitions. Stochastics An International Journal of Probability and Stochastic Processes, 1-33. (2010) Stability of hybrid stochastic delay systems whose discrete components have a large state space: **Involve - a journal of mathematics - Mathematical Sciences Publishers** Focusing on discrete-time-scale Markov chains, the contents of this book are an outgrowth of some of the Stochastic Modelling and Applied Probability. **Analysis of Discrete-time Stochastic Petri Nets** Focusing on discrete-time-scale Markov chains, the contents of this book are an outgrowth of some of the Stochastic Modelling and Applied Probability. **Discrete-Time Markov Chains - Two-Time-Scale Methods - Springer** different analysis techniques for timed Petri nets. determines the incidence matrix of a discrete, possibly infinite, Markov chain. many practical applications, the addition of time is a necessity. There are many ways to introduce time into Petri net models. a probability distribution for each delay, i.e., stochastic delays. **Cycle Representations of Markov Processes - Google Books Result Gang George Yin**   Grid-scale fluctuations and forecast error in wind power. G Bel . For the application analysis, the model was trained with original ex post data obtaining a stationary time series that can be used for Markov chain models. . Let X(t) be a stochastic process with the discrete state space S = {1, 2,.., n} and the **Discrete-Time Markov Chains - Two-Time-Scale Methods - Springer** This book focuses on two-time-scale Markov chains in discrete time. Methods and Applications (Stochastic Modelling and Applied Probability) 2005th Edition. **On Stochastic Processes Defined by Differential**

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The state **Discrete-Time Markov Chains: Two-Time-Scale Methods and** STAT 221 Statistical Concepts and Methods for the Social Sciences (5) NW, QSR STAT 341 Introduction to Probability and Mathematical Statistics II (4) NW STAT 423 Applied Regression and Analysis of Variance (4) NW . Covers discrete-time Markov chain theory inference for discrete-time Markov chains Monte **Asymptotic Expansions of Singularly Perturbed Systems Involving** This book focuses on two-time-scale Markov chains in discrete time. 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Applications of Mathematics, volume **Fitting timeseries by continuous-time Markov chains - Courant** (2015) Stochastic Averaging of Dynamical Systems with Multiple Time Scales Applied Stochastic Models in Business and Industry 30:6, 753-765. Stochastics An International Journal of Probability and Stochastic Processes 86:3, 527-550. by two-time-scale nonhomogeneous Markovian chains and applications to **Discrete-Time Markov Chains: Two-Time-Scale Methods and** Martingale Methods in Financial Modeling: Theory and Application (1997) 37 Yin/Zhang, Continuous-Time Markov Chains and 49 Kabanov/Pergamenshchikov, Two-Scale Stochastic Systems (2003) 50 Han, Information-Spectrum Methods in Information Theory (2003) 51 Asmussen, Applied Probability and Queues **A Two-Time-Scale Approach for Production Planning in Discrete** Focusing on discrete-time-scale Markov chains, the contents of this book are an outgrowth of some of the Stochastic Modelling and Applied Probability. **Discrete-Time Markov Chains: Two-Time-Scale Methods and** This book focuses on two-time-scale Markov chains in discrete time. system models arising from various applications, analyzing them via analytic and probabilistic techniques, Volume 55 of Stochastic Modelling and Applied Probability. **Discrete-Time Markov Chains - Two-Time-Scale Methods - Springer** Stochastic. Modelling. and. Applied. Probability. (continued from pane ii) 35 Kushner/Yin, Stochastic Continuous-Time Markov Chains and Applications (1998) 38 Discrete-Time Markov Chains: Two-Time-Scale Methods and Applications **Applied Mathematics Department - Brown University** DSA4212 Optimisation for Large-Scale Data-Driven Inference Topics include first and second order methods, stochastic gradient type approaches . 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SP Sethi Discrete-time Markov chains: two-time-scale methods and applications SIAM Journal on Applied Mathematics 64 (6), 2034-2049, 2004. 176, 2004. A regime-switching model for European options Annals of Applied Probability, 549-572, 2000. **Containment control of second-order discrete-time multi-agent** Algebraic, Stochastic and Analysis Structures for Networks, Data Classification and Academic Press, Boston (1990) Stewart, G.W., Zhang, G.: On a direct method for the solution of nearly uncoupled Markov chains. Two-time-scale methods and applications. Stochastic Modelling and Applied Probability, xix+348 pp.

Discrete-Time Markov Chains - Two-Time-Scale Methods - Springer Applied probability and stochastic processes, stochastic approximation and . Discrete-time Markov Chains: Two-time-scale Methods and Applications, Springer, New York, G. Yin, H.Q. Zhang, and Q. Zhang, Applications of Two-time-scale Markovian D.H. Nguyen and G. Yin, Modeling and analysis of switching diffusion