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and Autocorrelation Function of a Stochastic Process; 2.5 Stationary Stochastic Processes; 2.5.1 Strict-Sense Stationary Processes; 2.5.2 Wide-Sense Stationary Processes; 2.6 Ergodic Stochastic Processes; 2.7 Some Models of Stochastic Processes; 2.7.1 Martingales; Stopping Times; 2.7.2 Counting Processes
2.7.3 Independent Increment Processes2.7.4 Stationary Increment Process; 2.7.5 Poisson Processes; Interarrival Times for the Poisson Process; Compound Poisson Process; Combinations of Independent Poisson Processes; Competing Independent Poisson Processes; Subdivision of a Poisson Process; 2.8 Problems; 3 Introduction to Markov Processes; 3.1 Introduction; 3.2 Structure of Markov Processes; 3.3 Strong Markov Property; 3.4 Applications of Discrete-Time Markov Processes; 3.4.1 Branching Processes; 3.4.2 Social Mobility; 3.4.3 Markov Decision Processes
3.5 Applications of Continuous-Time Markov Processes3.5.1 Queueing Systems; 3.5.2 Continuous-Time Markov Decision Processes; 3.5.3 Stochastic Storage Systems; 3.6 Applications of Continuous-State Markov Processes; 3.6.1 Application of Diffusion Processes to Financial Options; 3.6.2 Applications of Brownian Motion; 3.7 Summary; 4 Discrete-Time Markov Chains; 4.1 Introduction; 4.2 State-Transition Probability Matrix; 4.2.1 The n-Step State-Transition Probability; 4.3 State-Transition Diagrams; 4.4 Classification of States; 4.5 Limiting-State Probabilities; 4.5.1 Doubly Stochastic Matrix
4.6 Sojourn Time

Sommario/riassunto

Markov processes are processes that have limited memory. In particular, their dependence on the past is only through the previous state. They are used to model the behavior of many systems including communications systems, transportation networks, image segmentation and analysis, biological systems and DNA sequence analysis, random atomic motion and diffusion in physics, social mobility, population studies, epidemiology, animal and insect migration, queueing systems, resource management, dams, financial engineering, actuarial science, and decision systems. Covering a wide range of