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Markov chains; 17. Random walk, Brownian motion, diffusion and it's processes; Part IV. Statistical Inference: 18. Estimation and decision theory; 19. Estimation algorithms; Part V. Applications and Advanced Topics: 20. Hidden Markov models and applications; 21. Probabilistic models in machine learning; 22. Filtering and prediction of random processes; 23. Queuing and loss models.

Sommario/riassunto

Together with the fundamentals of probability, random processes and statistical analysis, this insightful book also presents a broad range of advanced topics and applications. There is extensive coverage of Bayesian vs. frequentist statistics, time series and spectral representation, inequalities, bound and approximation, maximum-likelihood estimation and the expectation-maximization (EM) algorithm, geometric Brownian motion and Ito process. Applications such as hidden Markov models (HMM), the Viterbi, BCJR, and Baum-Welch algorithms, algorithms for machine learning, Wiener and Kalman filters, and queueing and loss networks are treated in detail. The book will be useful to students and researchers in such areas as communications, signal processing, networks, machine learning, bioinformatics, econometrics and mathematical finance. With a solutions manual, lecture slides, supplementary materials and MATLAB programs all available online, it is ideal for classroom teaching as well as a valuable reference for professionals.