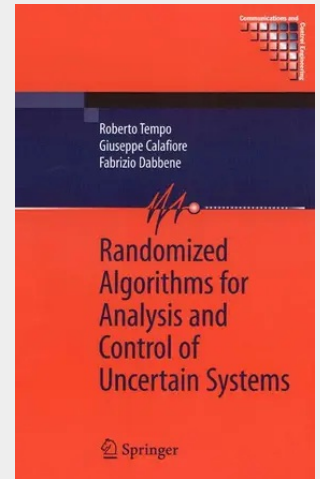


Randomized Algorithms for Analysis and Control of Uncertain Systems

Moving on from earlier stochastic and robust control paradigms, this book introduces the fundamentals of probabilistic methods in the analysis and design of uncertain systems. The use of randomized algorithms, guarantees a reduction in the computational complexity of classical robust control algorithms and in the conservativeness of methods like H-infinity control. Features: • self-contained treatment explaining randomized algorithms from their genesis in the principles of probability theory to their use for robust analysis and controller synthesis; • comprehensive treatment of sample generation, including consideration of the difficulties involved in obtaining independent and identically distributed samples; • applications in congestion control of high-speed communications networks and the stability of quantized sampled-data systems. This monograph will be of interest to theorists concerned with robust and optimal control techniques and to all control engineers dealing with system uncertainties.

The presence of uncertainty in a system description has always been a critical issue in control. Moving on from earlier stochastic and robust control paradigms, the main objective of this book is to introduce the reader to the fundamentals of probabilistic methods in the analysis and design of uncertain systems. Using so-called "randomized algorithms", this emerging area of research guarantees a reduction in the computational complexity of classical robust control algorithms and in the conservativeness of methods like H-infinity control. Features: • self-contained treatment explaining randomized algorithms from their genesis in the principles of probability theory to their use for robust analysis and controller synthesis; • comprehensive treatment of sample generation, including consideration of the difficulties involved in obtaining independent and identically distributed samples; • applications of randomized algorithms in congestion control of high-speed communications networks and the stability of quantized sampled-data systems. Randomized Algorithms for Analysis and Control of Uncertain Systems will be of certain interest to control theorists concerned with robust and optimal control techniques and to all control engineers dealing with system uncertainties. The present book is a very timely contribution to the literature. I have no hesitation in asserting that it will remain a widely cited reference work for many years. M. Vidyasagar



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