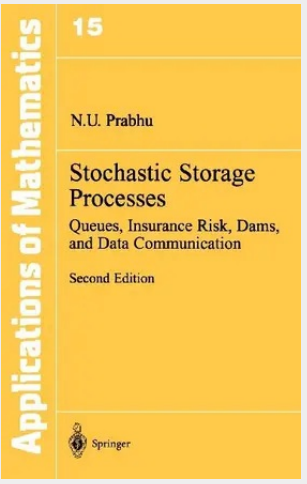
Prabhu

Stochastic Storage Processes

Queues, Insurance Risk, Dams, and Data Communication

This is a revised and expanded version of the earlier edition. The new material is on Markov-modulated storage processes arising from queueing and data commu nication models. The analysis of these models is based on the fluctuation theory of Markov-additive processes and their discrete time analogues, Markov random walks. The workload and queue length processes, omitted from the earlier edition, are also presented. In addition, many sections have been rewritten, with new re sults and proofs, as well as further examples. The mathematical level and style of presentation, however, remain the same. Chapter I contains a comprefensive treatment of the waiting time and related quantities in a single server queue, combining Chapters 1 and 2 of the earlier edition. In Chapter 2 we treat the (continuous time) workload and queue length processes using their semiregenerative properties. Also included are bulk queues omitted from the earlier edition, but included in its Russian translation. The queue MIMll is presented in Chapter 3. This is the so-called simple queue, but its treat ment in most of the literature is far from simple. Our analysis of the queue length process is elementary and yields explicit results for various distributions of interest. are treated in Chapter 4, combining Chapters 3 Continuous time storage models and 4 of the earlier edition. We present extensive new material, omitting much of the old Chapter 4. This has resulted in a streamlined account of this important class of models.

This monograph will be of interest to researchers in applied probability. The book includes applications to queueing theory, insurance, and data communications. Professor Prabhu is one of the leading figures in this field.



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