

Random processes by example

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Abstrak

This volume first introduces the mathematical tools necessary for understanding and working with a broad class of applied stochastic models. The toolbox includes Gaussian processes, independently scattered measures such as Gaussian white noise and Poisson random measures, stochastic integrals, compound Poisson, infinitely divisible and stable distributions and processes.

Next, it illustrates general concepts by handling a transparent but rich example of a "teletraffic model". A minor tuning of a few parameters of the model leads to different workload regimes, including Wiener process, fractional Brownian motion and stable Levy process. The simplicity of the dependence mechanism used in the model enables us to get a clear understanding of long and short range dependence phenomena. The model also shows how light or heavy distribution tails lead to continuous Gaussian processes or to processes with jumps in the limiting regime. Finally, in this volume, readers will find discussions on the multivariate extensions that admit a variety of completely different applied interpretations.