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Random Variables and Stochastic Processes

A Comprehensive Guide

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Random Variables and Stochastic Processes provides a modern, application-driven introduction to probability theory for undergraduate and postgraduate students in Electronics and Communication Engineering (ECE), Computer Science and Engineering (CSE), Information Technology, and related disciplines.

Unlike traditional texts that emphasize abstract mathematical proofs, this book connects probability theory to today's rapidly evolving technologies. From the opening chapter, readers explore the role of probability in probabilistic computing, quantum computing, and information entropy, gaining a clear understanding of why stochastic methods are essential to modern engineering and computer science.

The text progresses from the fundamentals of probability and random variables to stochastic processes, linear systems with random inputs, and advanced noise modeling. Throughout, mathematical concepts are reinforced with practical engineering applications, enabling students to develop both theoretical understanding and real-world problem-solving skills.

Written in a clear and accessible style, the book balances rigorous coverage with intuitive explanations, making complex topics easier to understand without sacrificing technical depth. Examples and applications drawn from wireless communications, cybersecurity, signal processing, and emerging computing technologies demonstrate the relevance of stochastic methods across today's engineering landscape.

Ideal for classroom instruction and self-study, this textbook equips students with the mathematical foundation and practical perspective needed to succeed in advanced engineering courses and modern technology-driven careers.

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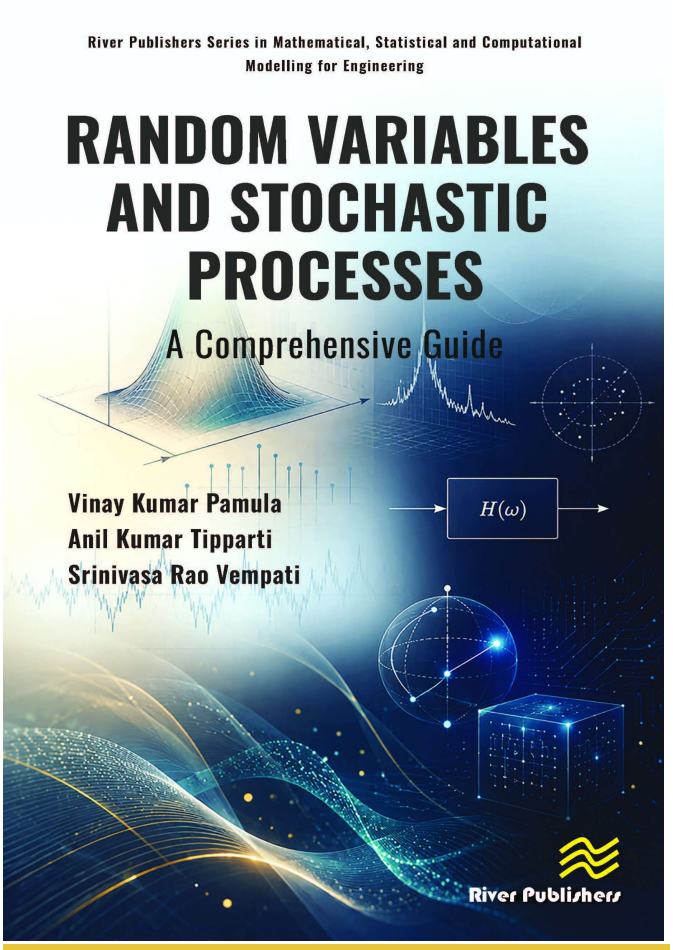

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