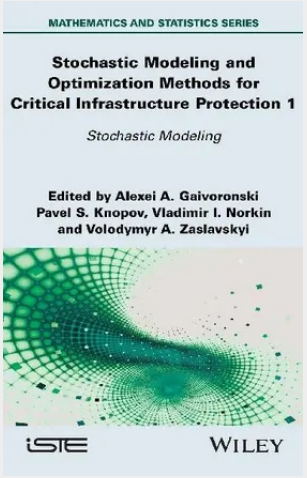
Gaivoronski / Knopov / Norkin

Stochastic Modeling and Optimization Methods for Critical Infrastructure Protection, Volume 1

Stochastic Modeling

Stochastic Modeling and Optimization Methods for Critical Infrastructure Protection is a thorough exploration of mathematical models and tools that are designed to strengthen critical infrastructures against threats – both natural and adversarial. Divided into two volumes, this first volume examines stochastic modeling across key economic sectors and their interconnections, while the second volume focuses on advanced mathematical methods for enhancing infrastructure protection. The book covers a range of themes, including risk assessment techniques that account for systemic interdependencies within modern technospheres, the dynamics of uncertainty, instability and system vulnerabilities. The book also presents other topics such as cryptographic information protection and Shannon's theory of secret systems, alongside solutions arising from optimization, game theory and machine learning approaches. Featuring research from international collaborations, this book covers both theory and applications, offering vital insights for advanced risk management curricula. It is intended not only for researchers, but also educators and professionals in infrastructure protection and stochastic optimization.

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