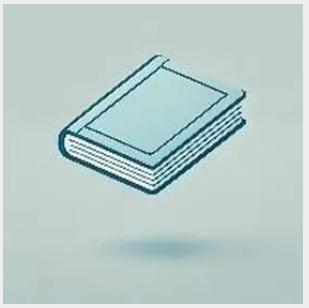
Shekhar / Kumar

Advanced Queueing and Reliability Engineering

Theory, Optimization, and Applications



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Advanced Queueing and Reliability Engineering: Theory, Optimization, and Applications combines queueing theory, reliability engineering, and optimization techniques, offering a balanced view of both theory and practical application. It focuses on engineering applications, real-world case studies, and computational tools, making it relevant for academics and industry practitioners alike. By incorporating interdisciplinary approaches like AI-driven reliability modeling and uncertainty analysis, the book not only presents existing solutions but also outlines future research avenues. Structured for progressive learning, it begins with fundamental concepts and advances to sophisticated techniques, ensuring accessibility for graduate students and early-career researchers while providing depth for seasoned scholars. Key topics include Markovian and non-Markovian systems, breakdown modeling, and reliability engineering, with chapters supported by case studies from various sectors, including telecommunications, healthcare, and aviation. This book emphasizes optimization techniques, including metaheuristics and classical methods such as dynamic programming, to enhance system performance. Additionally, it includes an introductory chapter on probability, statistics, and optimization to equip readers with essential knowledge. Overall, this resource is invaluable for those looking to navigate the complexities of queueing and reliability models in modern engineering contexts.

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