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Sommario/riassunto

"Recent advances in science and technology have made modern computing and engineering systems more powerful and sophisticated than ever. The increasing complexity and scale imply that system reliability problems not only continue to be a challenge but also require more efficient models and solutions. This is the first book systematically covering the state-of-the-art binary decision diagrams and their extended models, which can provide efficient and exact solutions to reliability analysis of large and complex systems. The book provides both basic concepts and detailed algorithms for modelling and evaluating reliability of a wide range of complex systems, such as multi-state systems, phased-mission systems, fault-tolerant systems with imperfect fault coverage, systems with common-cause failures, systems with disjoint failures, and systems with functional dependent failures. These types of systems abound in safety-critical or mission-critical applications such as aerospace, circuits, power systems, medical systems, telecommunication systems, transmission systems, traffic light systems, data storage systems, and etc. The book provides both small-scale illustrative examples and large-scale benchmark examples to demonstrate broad applications and advantages of different decision diagrams based methods for complex system reliability analysis. Other measures including component importance and failure frequency are also covered. A rich set of references is cited in the book, providing helpful resources for readers to pursue further research and study of the topics. The target audience of the book is reliability and safety engineers or researchers. The book can serve as a textbook on system reliability analysis. It can also serve as a tutorial and reference book on decision diagrams, multi-state systems, phased-mission systems, and imperfect fault coverage models. "--