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	Sommario/riassunto	This book presents a comprehensive study covering the design and application of models and algorithms for assessing the joint device failures of telecommunication backbone networks caused by large-scale regional disasters. At first, failure models are developed to make

use of the best data available; in turn, a set of fast algorithms for determining the resulting failure lists are described; further, a theoretical analysis of the complexity of the algorithms and the properties of the failure lists is presented, and relevant practical case studies are investigated. Merging concepts and tools from complexity theory, combinatorial and computational geometry, and probability theory, a comprehensive set of models is developed for translating the disaster hazard in informative yet concise data structures. The information available on the network topology and the disaster hazard is then used to calculate the possible (probabilistic) network failures. The resulting sets of resources that are expected to break down simultaneously are modeled as a collection of Shared Risk Link Groups (SRLGs), or Probabilistic SRLGs. Overall, this book presents improved theoretical methods that can help predicting disaster-caused network malfunctions, identifying vulnerable regions, and assessing precisely the availability of internet services, among other applications.