

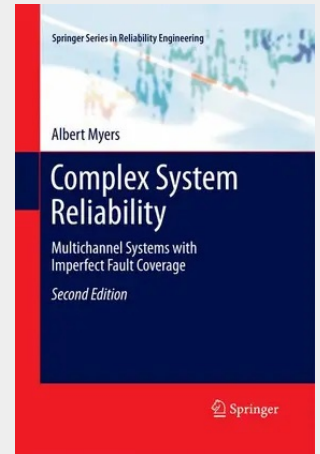
Complex System Reliability

Multichannel Systems with Imperfect Fault Coverage

Complex System Reliability presents a state-of-the-art treatment of complex multi-channel system reliability assessment and provides the requisite tools, techniques and algorithms required for designing, evaluating and optimizing ultra-reliable redundant systems.

Critical topics that make Complex System Reliability a unique and definitive resource include: • redundant system analysis for k-out-of-n systems (including complex systems with embedded k-out-of-n structures) involving both perfect and imperfect fault coverage; • imperfect fault coverage analysis techniques, including algorithms for assessing the reliability of redundant systems in which each element is subject to a given coverage value (element level coverage) or in which the system uses voting to avoid the effects of a failed element (fault level coverage); and • state-of-the-art binary decision diagram analysis techniques, including the latest and most efficient algorithms for the reliability assessment of large, complex redundant systems. This practical presentation includes numerous fully worked examples that provide detailed explanations of both the underlying design principles and the techniques (such as combinatorial, recursive and binary decision diagram algorithms) used to obtain quantitative results. Many of the worked examples are based on the design of modern digital fly-by-wire control system technology. Complex System Reliability provides in-depth coverage of systems subject to either perfect or imperfect fault coverage and also the most recent techniques for correctly assessing the reliability of redundant systems that use mid-value-select voting as their primary means of redundancy management. It is a valuable resource for those involved in the design and reliability assessment of highly reliable systems, particularly in the aerospace and automotive sectors.

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