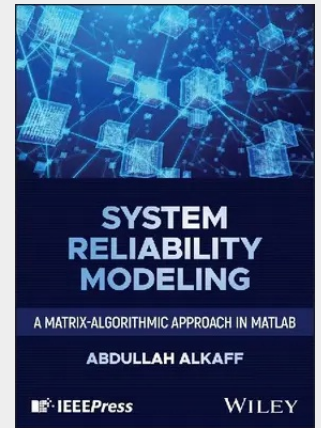


System Reliability Modeling

A Matrix-algorithmic Approach in MATLAB

Technical, comprehensive resource on system reliability modeling System Reliability Modeling develops algorithms for generating a system reliability model using matrix algebra. All algorithms are presented in ready-to-use MATLAB functions ensuring system reliability modeling becomes as simple as writing a few lines of MATLAB code, no matter how complex the system structures are. All functions are managed in a user-friendly software package to simplify modeling and analyzing of the reliability of a complex system. The package is also utilized to investigate the optimum maintenance and replacement programs, component orderings, and warmness levels in standby systems. The book includes examples and simple exercises for every topic, applications for real systems, problems at the end of each chapter, chapters on discrete time systems, and the use of AI in system reliability. This book discusses: - Matrix-based distributions, covering continuous-time Markov chains (CTMC), ways to model CTMC, phase-type (PH) and matrix-exponential (ME) distributions, similarity transformation, and approximating scalar distributions with PH distributions - One-component systems, covering reliability, hazard, and mean residual lifetime functions, perfect and imperfect maintenance, optimum replacement interval, and stock-out risk - Basic structured systems, covering series, parallel, standby with perfect and imperfect switches structures, and any combination of these structures - General structure systems, covering a method to incorporate warmness levels into standby systems, so that one standby model applies to hot, warm, and cold standby in any combination thus applicable to all basic structured systems - Network reliability, covering methods for converting Boolean structure functions into arithmetic functions and calculating network's reliability measures and the maximum reliability function in capacitated networks System Reliability Modeling is an excellent resource for students, researchers, reliability engineers, maintenance engineers, and spare part logistics engineers seeking a rigorous analytical method in system design for reliability.

Technical, comprehensive resource on system reliability modeling System Reliability Modeling develops algorithms for generating a system reliability model using matrix algebra. All algorithms are presented in ready-to-use MATLAB functions ensuring system reliability modeling becomes as simple as writing a few lines of MATLAB code, no matter how complex the system structures are. All functions are managed in a user-friendly software package to simplify modeling and analyzing of the reliability of a complex system. The package is also utilized to investigate the optimum maintenance and replacement programs, component orderings, and warmness levels in standby systems. The book includes examples and simple exercises for every topic, applications for real systems, problems at the end of each chapter, chapters on discrete time systems, and the use of AI in system reliability. This book discusses: - Matrix-based distributions, covering continuous-time Markov chains (CTMC), ways to model CTMC, phase-type (PH) and matrix-exponential (ME) distributions, similarity transformation, and approximating scalar distributions with PH distributions- One-component systems, covering reliability, hazard, and mean residual lifetime functions, perfect and imperfect maintenance, optimum replacement interval, and stock-out risk- Basic structured systems, covering series, parallel, standby with perfect and imperfect switches structures, and any combination of these structures- General structure systems, covering a method to incorporate warmness levels into standby systems, so that one standby model applies to hot, warm, and cold standby in any combination thus applicable to all basic structured systems- Network reliability, covering methods for converting Boolean structure functions into arithmetic functions and calculating network's reliability measures and the maximum reliability function in capacitated networks System Reliability Modeling is an excellent resource for students, researchers, reliability engineers, maintenance engineers, and spare part logistics engineers seeking a rigorous analytical method in system design for reliability.



145,50 €

145,50 € (zzgl. MwSt.)

vorbestellbar, Erscheinungstermin ca. Januar 2027

Artikelnummer: 9781394371129

Medium: Buch

ISBN: 978-1-394-37112-9

Verlag: John Wiley & Sons Inc

Erscheinungstermin: 11.01.2027

Sprache(n): Englisch

Auflage: 1. Auflage 2027

Produktform: Gebunden

Seiten: 624

