

Lz-transform and inverse Lz-transform application to dynamic reliability assessment for multi-state system - DTU Orbit (08/11/2017)

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The paper presents a new method for reliability assessment for complex multi-state system. The system and its components can have different performance levels ranging from perfect functioning to complete failure. Straightforward Markov method applied to solve the problem will require building of the system model with great number of states and solving a corresponding system of differential equations. Lz-transform method, which is used for reliability assessment drastically simplified the solution. Instead of straightforward finding of the resulting output stochastic process for entire MSS in the paper proposed finding Lztransform of this output process, which is essentially simpler because of using Ushakov's universal generating operator. Some reliability indices such as availability, expected performance, etc. may be found from the expression of this Lztransform. In order to find other indices such as reliability function, mean time to failure etc. inverse LZ-transform is using that completely reveals underlying output process.

General information

State: Published

Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Israel Electric Corporation Ltd.

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Pages: 11-19

Publication date: 2014

Host publication information

Title of host publication: Proceedings of the 20th Issat International Conference Reliability and Quality in Design

ISBN (Print): 9780991057603

Main Research Area: Technical/natural sciences

Conference: 20th ISSAT International Conference on Reliability and Quality in Design, Seattle, Washington, United States, 07/08/2014 - 07/08/2014

Safety, Risk, Reliability and Quality, Inverse Lz-transform, Lz-transform, Multi-state system, Reliability, Universal generating function, Differential equations, Random processes, Reliability analysis, Stochastic systems, Dynamic reliability assessment, Mean time to failure, Reliability assessments, Reliability functions, System of differential equations, Transform methods, Universal generating functions, Inverse transforms

Source: FindIt

Source-ID: 2288376470

Publication: Research - peer-review › Article in proceedings – Annual report year: 2015