Abstract

It is of paramount important to identify and rank the influence of components on the performance of interest. System sensitivity analysis provides a quantitative tool for accessing the importance of components within a specific system configuration. In practice, however, due to lack of information, there exist epistemic uncertainty within the components distribution parameters, which makes it is hard to estimate the reliability of the corresponding system. In this paper, survival signature is adopted to evaluate the system performance, and the area value of the probability box is introduced to reflect the epistemic uncertainty of the system. Also, in order to find out which component or components set is more sensitive to the system, the probability bounds analysis which bases on pinching method is used. Two case studies are presented to show the applicability of the approaches.

References

Sensitivity Analysis for Systems under Epistemic Uncertainty with Probability Bounds Analysis

19. F Owen Hoffman and Jana S Hammonds. Propagation of uncertainty in risk assessments: the need to distinguish between uncertainty due to lack of knowledge and


Index Terms

Computer Science

Applied Mathematics
Keywords

Sensitivity Analysis, Epistemic Uncertainty, Probability Bounds Analysis, Systems Reliability