Bayesian Methods for Estimating the Reliability of Complex Systems Using Heterogeneous Multilevel Information

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ABSTRACT
We propose a Bayesian approach for assessing the reliability of multi-component systems. Our models allow us to evaluate system, subsystem, and component reliability using the available multilevel information. Data are collected over time, and include pass/fail, lifetime, censored, and degradation data. We illustrate the methodology through an example and discuss how to extend the approach to more complex systems.

KEY WORDS: Degradation, Hierarchical model, Lifetime, Multi-component system, System reliability