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Compound Poisson Process for Modeling of Aggregated Failures

Wednesday, 13 September 2023 10:00 (20 minutes)

As part of the Dutch national PrimaVera project (www.primavera-project.com), an extensive case study with a leading high-tech company on predicting and monitoring failure rates of components is being carried out. Following common practice from reliability engineers, the engineers of the high-tech company frequently use the Crow-AMSAA model for age-dependent reliability problems. There are, however, two main assumptions that are not satisfied when the number of failures is aggregated by reports. First that we can observe a large overdispersion in the data. The second is that the observed number of simultaneous events is greater than one. We propose a different approach using a Compound Power Law Process. The discussion of the chosen distribution functions and results of the fitted model simulations are presented. We compare our proposed model to the classical approach and comment on practical issues related to the case study at hand.

Keywords

compound Poisson process, failure modeling, repairable system analysis

Classification

Both methodology and application

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