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Título: Flexible Linear Degradation Models

Resumo: We introduce flexible classes of linear degradation models that accommodate skewness and heavy tailed behaviors. That is achieved by assuming that the degradation or the reciprocal degradation rates have distributions in both families, the scale mixture of skew-normal and the log-scale mixture of skew-normal. Similar to what was observed for the Weibull case, we prove that the distributions for the failure time and the degradation rate belong to the same family for the majority under the proposed models. Such a result is mainly useful to infer about the failure time when the analytical method is considered. To assess the reliability of the system, we consider the posterior predictive distribution for the failure time. We introduce an algorithm to sample from the posterior distribution which is based on data augmentation technique. We carry out a simulation study comparing the proposed approach with Hamada's method. We analyze data of train wheels degradation which present several atypical paths. Results show that the proposed models performed better than the existent models to analyze data sets which present atypical paths and are comparable to the Weibull model when analyzing light-tailed and symmetric data.