Professor Tilmann Gneiting

Editor-in-Chief, Annals of Applied Statistics

Dear Professor Gneiting:

On behalf of myself and my co-authors, I would like to submit our paper “A Hierarchical Failure-Time Model for Observational Data Exhibiting Infant-Mortality and Wearout Failure Modes” for consideration for publication in the Annals of Applied Statistics. The motivation for this work initially came from a publicly available data set with hard drive failures grouped by brand. There was little information in the data due to left truncation and heavy right censoring—hard disk drives rarely fail. Moreover, standard lifetime models were too simplistic to capture the bathtub hazard we observed in the data. As we developed our model we realized this problem of limited information, and multiple failure modes, is common in consumer product reliability data. Standard parametric models are too simple to capture multiple failure modes, and more complex models often require more information for estimation than is available. The hierarchical Generalized Limited Failure Population model we present in this paper addresses both of these problems in a unified and computationally straightforward framework, useful for practitioners. I presented this work at JSM this past year and multiple researches from companies such as Gortex and Regeneron, expressed strong interest in the model. Both companies have data that rarely fails making it impossible to fit complex failure time models in order to compare lifetime distributions across products.

We hope that you and the reviewers like the paper. We will look forward to hearing from you at the completion of the review process.

Sincerely,