

Accepted Manuscript

Survival analysis of fatigue data: Application of generalized linear models and hierarchical Bayesian model

Xiao-Wei Liu, Da-Gang Lu

PII: S0142-1123(18)30313-X
DOI: <https://doi.org/10.1016/j.ijfatigue.2018.07.027>
Reference: JIJF 4781

To appear in: *International Journal of Fatigue*

Received Date: 30 March 2018
Accepted Date: 22 July 2018

Please cite this article as: Liu, X-W., Lu, D-G., Survival analysis of fatigue data: Application of generalized linear models and hierarchical Bayesian model, *International Journal of Fatigue* (2018), doi: <https://doi.org/10.1016/j.ijfatigue.2018.07.027>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



1 Survival analysis of fatigue data: Application of
2 generalized linear models and hierarchical Bayesian
3 model

4 Xiao-Wei Liu^{a,b,*}, Da-Gang Lu^{a,b,**}

5 ^a*Key Lab of Structures Dynamic Behavior and Control of the Ministry of Education,*
6 *Harbin Institute of Technology, Harbin 150090, China*

7 ^b*School of Civil Engineering, Harbin Institute of Technology, Harbin 150090, China*

8 **Abstract**

The survival analysis is introduced to describe the fatigue failure process in this paper for obtaining a set of flexible and accurate probabilistic stress-life ($P-S-N$) curves in fatigue reliability analysis. The generalized linear models (GLMs) are applied as well for expressing a trend and random errors of the $P-S-N$ curves simultaneously. A GLM, including a linear Basquin relation and a shape-fixed Weibull hazard function, has been established for the $P-S-N$ curves estimation, then a hierarchical Bayesian model is employed to estimate their parameters. The fatigue probability design curves are generated by the survivor function or the resulting predictive distributions. Finally, a comparative example is presented to verify the effectiveness of the method.

9 *Keywords:* Fatigue, $P-S-N$ curves, Survival analysis, Generalized linear
10 models, Hierarchical Bayesian model

*Corresponding author

**Principal corresponding author

Email addresses: xw.liu@outlook.com (Xiao-Wei Liu), ludagang@hit.edu.cn (Da-Gang Lu)

Download English Version:

<https://daneshyari.com/en/article/7171224>

Download Persian Version:

<https://daneshyari.com/article/7171224>

[Daneshyari.com](https://daneshyari.com)