# Modelling heterogeneity in repeated failure time data: A hierarchical Bayesian approach

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**Abstract**

Heterogeneity in data has been frequently encountered and incorporated in modelling and inference problems in many areas. As far as reliability data are concerned this issue has been addressed only to a very limited extent. This paper develops inference procedures which can take into account different kinds of heterogeneity in repeated failure time data and enable inference not only on population parameters relating to the survival process, but also underlying processes that lead to such observed heterogeneity between individuals. We illustrate the proposed model by analyzing real life data sets, wherein, although the observations consist of times to repeated occurrences of failures/events from similar systems/subjects, several factors can cause them to behave differently. We propose hierarchical Bayes models for these data. The gains from the proposed models can be observed form the predictive distributions. Inference on model parameters and predictions were carried out using MCMC sampler.