

# Statistical Monitoring of Incomplete Data from Censored Life Testing



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## Abstract

Life tests for highly-reliable products often take a long time even using accelerated life testing with censoring. When the production process is monitored with the lifetime as the key quality characteristic, the time spent on life testing could incur significant delays for practitioners to make decisions after sampling. However, shortening the test duration, that results in excessive right-censored observations, inevitably degrades the test power for anomaly detection. In this talk, we will investigate the optimal design of censoring time in life tests when monitoring lifetime data with the likelihood-based control charts. Both finite-sample analytical and large-sample asymptotic expressions of ATS metrics are derived for type-I censored exponential lifetimes. Our investigation uncovers the twofold impact of censoring time on the actual performance of control charts under various scenarios and provides useful references for practitioners to set more sensible censoring times in life testing.

## About the Speaker

Dr. Xun Xiao is currently a Lecturer in Statistics at the Dept. of Mathematics and Statistics, University of Otago, New Zealand. He received B.Sc. in Statistics from the University of Science and Technology of China in 2011 and Ph.D. degree under the supervision of Prof. Min Xie from the Dept. of Systems Engineering and Engineering Management at City University of Hong Kong in 2016. His research focuses on various statistics and data analytics problems arising from interdisciplinary areas, including industrial engineering, natural hazard, veterinary science, food science, etc. He has published more than 20 papers in peer-reviewed journals.