Special Session Title:

Advances in Test Planning and Design for Lifetime Testing in Reliability Engineering

Session Overview:

Lifetime testing plays a critical role in ensuring the reliability of modern systems and components, especially in industries where failure is not an option or tolerable up to a certain percentage. However, designing efficient and accurate test plans that account for the growing complexity of these systems remains a significant challenge. This special session will explore recent advances in test planning and design for lifetime testing, with a focus on innovative strategies that enhance test success rates and improve predictive accuracy while considering testing effort.

Key Objectives and Scope:

Key topics to be discussed include methods for accelerated life testing, statistical approaches to test planning, and strategies to address incomplete or censored data with different censoring pattern. Additionally, we will discuss how optimizing test parameters can increase the likelihood of drawing meaningful conclusions from lifetime tests. Furthermore, we will examine the role of Design of Experiments (DoE) for Multivariate Lifetime Prediction, exploring how experimental designs can effectively model and predict lifetimes when multiple stress factors or covariates are involved.

Target Audience:

The session aims to foster discussions on modern approaches, such as simulation-based testing and machine learning-enhanced test design, which can streamline test processes while improving the accuracy of lifetime predictions. Real-world case studies will highlight successful applications of these techniques in improving product reliability and test efficiency across various industries.

Expected Outcomes:

By bringing together experts from academia and industry, this session will promote the exchange of ideas and methodologies that lead to more robust, efficient, and scalable test design frameworks.

Call for Contributions:

We encourage submissions that present innovative methods, case studies, or theoretical insights, especially in areas like probabilistic test success modeling, multivariate experimental designs, and advanced statistical methods for lifetime testing and prediction.

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