

Inference and Design in Degradation Tests

蔡志群

淡江大學數學學系

摘要

This panel discussion presentation focuses on the importance of reliability in various industries, emphasizing its impact on reputation, warranty costs, competitive advantage, customer satisfaction, and repeat business. The discussion delves into degradation models, including fixed or random effect models, stochastic processes models such as Wiener processes, gamma processes, and inverse Gaussian processes, and mixed models combining random effects and stochastic processes. The discussion will explore the design of degradation tests, discussing optimal test plans considering budget constraints, measurement frequency, and number of units, as well as optimal burn-in and acceptance strategies considering experiment costs and misclassification costs. Maintenance policies, including imperfect maintenance and replacement costs, are also addressed. The presentation will provide a comprehensive overview of literature references and methodologies employed in degradation analysis, offering insights into decision-making processes in assessing product lifetime and reliability.

關鍵詞：Degradation models, Stochastic processes, Accelerated tests, Optimal test plans, Burn-in strategies, Acceptance strategies, Maintenance policies.