

中央研究院統計科學研究所

學術演講

講題：Dynamic Condition-Based Maintenance for Lifetime Delayed Degradation Process With Heterogeneity

演講人：Prof. Hon Keung Tony Ng

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時間：2024-12-23(Mon.) 10:30-12:00

地點：Auditorium, B1F, Institute of Statistical Science; The tea reception will be held at 10:10.

備註：Lecture in English. Online live streaming through Cisco Webex will be available.

Abstract

The dynamic planning of a condition-based maintenance strategy based on the degradation process has been of great interest in the last decade. This study considers a general and flexible lifetime delayed heterogeneous degradation process (LDHDP), in which the degradation process has random initial effects and covariates associated with the operation characteristic. This model is suitable for engineering data that indicate a product's degradation process starts randomly, and the initiation time of the degradation process is correlated with the degradation rate (i.e., the heterogeneity of the degradation process). Based on the LDHDP, we develop a periodic-sequential inspection and maintenance strategy that minimizes the expected unit time cost. Considering the heterogeneity between products, the value of information is employed to evaluate the information value of the subsequent inspection time, which is used to adapt different degradation rates among products. The performance of the proposed strategy is evaluated and compared to some existing maintenance strategies using a Monte Carlo simulation study. The simulation results show the proposed strategy gives a lower cost in many scenarios. A practical example illustrates the proposed strategy, which prefers preventive maintenance more often.



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