

PIPGES · WEBINARS

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02:00 PM

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Interinstitutional Graduate Program in Statistics (PIPGES) of Federal University of São Carlos with University of São Paulo promotes seminars groups (temporarily webinars, due to pandemic issues) of researches involving Probability, Statistics, Machine Learning etc. Our interest, among other things, is to stimulate the sharing of knowledge, as well as the connection between members of the program and researchers in other institutions.

Organizer

Michel H. Montoril, Department of Statistics,
Federal University of São Carlos.

MODELING MULTIVARIATE DEGRADATION PROCESSES WITH TIME-VARIANT COVARIATES AND IMPERFECT MAINTENANCE EFFECTS

This paper proposes two types of degradation models that are suitable for describing multivariate degrading systems subject to time-variant covariates and imperfect maintenance activities. A multivariate Wiener process is constructed as a baselinemodel, on top of which two types of models are developed to meaningfully characterize the time-variant covariates and imperfect maintenance effects. The underlying difference between the two models lies in the way of capturing the influences of covariates and maintenance: The first model reflects these impacts in the degradation rates/paths directly, whereas the second one describes the impacts by modifying the time scales governing the degradation processes. In each model, two particular imperfect maintenance models are presented, which differ in the extent of reduction in degradation level or virtual age. The two degradation models are then compared in certain special cases. The proposed multivariate degradation models pertain to complex industrial systems whose health deterioration can be characterized by multiple performance characteristics and can be altered or affected by maintenance activities and operating/environmental conditions.

SPEAKER

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BIO

Olivier Gaudoin received the M.Sc. and Ph.D. degrees in applied mathematics from Grenoble University, France, in 1986 and 1990, respectively. He is a Professor at Université Grenoble Alpes, France, in the Graduate School of Computer Science and Applied Mathematics. He is Director of International Relations of this School. His research interests are probabilistic modeling and statistical analysis for the reliability of complex systems, including ageing and maintenance modeling, competing risks, goodness-of-fit testing, and random processes in reliability.