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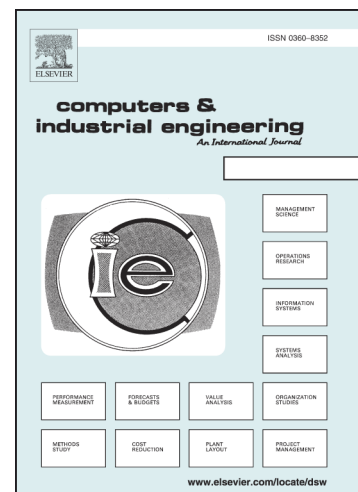
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Prognostics for non-monotonous health indicator data with jump diffusion process

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Abstract

For the very first time a jump diffusion process with Markovian covariates is used for prognostics and health monitoring. This paper aims to give a methodology for reliability and lifetime estimation of a non-increasing, deteriorating system where the increments are not normally distributed and the Wiener process cannot be used. We propose, first to study of the statistical properties of increments. Afterward the measures dependency is tested. A jump diffusion process with a covariate is considered to fit the deterioration model. The covariate models the environmental conditions. The proposed deterioration model is applied to a large set of collected data corresponding to the health indicators in ageing components in hydraulic electrical production systems and prognostic results are given.

Keywords: Prognostics and health monitoring, Reliability analysis, non-monotone deterioration modelling, Jump diffusion process, data analysis, Hydraulic electrical production system

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