
Managing uncertainties in prognostics for effective decision-making

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Résumé

In prognostics, inevitable uncertainties encompass various factors such as process variability, model assumptions, measurement inaccuracies, and uncertainties inherent in predicting future system states. Process uncertainty arises from variations in system behavior due to operating conditions and environmental factors. Model uncertainty stems from assumptions made during modeling, potentially leading to discrepancies between model predictions and real-world behavior. Measurement uncertainty is critical to consider, as sensor noise and errors can affect data accuracy. Moreover, predicting future system states inherently involves uncertainty due to unknown future usage and operating conditions. Effectively managing these uncertainties is crucial for making informed post-prognostics decisions. In this light, our contributions involve innovating prognostic approaches to manage uncertainties effectively and developing robust strategies for post-prognostic decisions, accounting for uncertainties inherent in prognostic information.

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