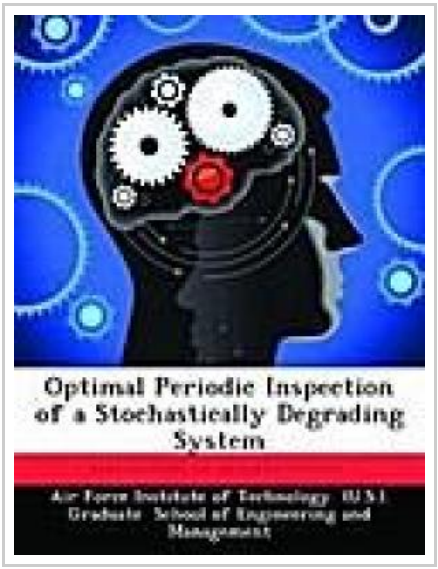

Optimal Periodic Inspection of a Stochastically Degrading System

By Air Force Institute of Technology (U. S.). Graduate School of Engineering and Management

Biblioscholar Sep 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x9 mm. This item is printed on demand - Print on Demand Neuware - This thesis develops and analyzes a procedure to determine the optimal inspection interval that maximizes the limiting average availability of a stochastically degrading component operating in a randomly evolving environment. The component is inspected periodically, and if the total observed cumulative degradation exceeds a fixed threshold value, the component is instantly replaced with a new, statistically identical component. Degradation is due to a combination of continuous wear caused by the component's random operating environment, as well as damage due to randomly occurring shocks of random magnitude. In order to compute an optimal inspection interval and corresponding limiting average availability, a nonlinear program is formulated and solved using a direct search algorithm in conjunction with numerical Laplace transform inversion. Techniques are developed to significantly decrease the time required to compute the approximate optimal solutions. The mathematical programming formulation and solution techniques are illustrated through a series of increasingly complex example problems. 144 pp. Englisch.

Reviews

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