Applying Neural Network in the Dynamic Reliability Analysis of Flexible Assembly Systems

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ABSTRACT

For present-day industry, the adoption of flexible manufacturing systems(FMSs) and/or flexible assembly systems(FASs) has become a crucial way to acco-mmodate the morden market competition, improve product quality, and reduce di-rect labor costs. Since the system reliability of FASs has a direct impact on product quality and production efficiency for a highly automated assembly line. Therefore, how to find a resonable method to predict FASs reliability has b-ecome an eager task. The reliability problems of FASs have not been discussed systematically hitherto due to the system''s inherent complexity. All relative researches limited their focus on the FMSs or robot reliability analysis.In t-his research, we define the system failures, reliability, availiability,and t-he basic constitutions of FASs. Futhermore, we propose the dynamic reliability and availiability models for FASs which are based on Markov process.And we b-uild a reliability predicting model by applying neural network.Finally, we ve-rified that neural network is a useful reliability and availiability predicti-ng tool and indicates great potential evolution through a case study.

Keywords : flexible assembly systems ; Markov process ; reliability ; availiability ; neural network

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