

## **Residual Life Prediction for a System Subject to Condition Monitoring and Two Failure Modes**

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**Abstract :** In this paper, we investigate the residual life prediction problem for a partially observable system subject to two failure modes, namely a catastrophic failure and a failure due to the system degradation. The system is subject to condition monitoring and the degradation process is described by a hidden Markov model with unknown parameters. The parameter estimation procedure based on an EM algorithm is developed and the formulas for the conditional reliability function and the mean residual life are derived, illustrated by a numerical example.

**Keywords :** partially observable system, hidden Markov model, competing risks, residual life prediction

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