TECHNOLOGY

System Health Management based on Hybrid Dynamic Bayesian Network Modeling

OVERVIEW

Background
As systems become more complex, there is a need to monitor different subsystems and components to detect failure. Even a relatively simple system, like a commercial UAV, can have dozens of sensors and components, each of which can be a point of failure. However, basic monitoring of these components is not enough, since failure may occur while a device is in use, i.e. a UAV while in flight. A algorithm which could not only in the diagnosis of a failed component, but could also develop a prediction about reliability, monitor a system, and autonomously make a maintenance decision would help improve the effectiveness of some systems.
Innovative Technology
Researchers at the University of Maryland have developed algorithms to assess the overall health of a physical system via a dynamic Bayesian network that is used to represent complex systems and model degradation using continuous and continuous variables. The algorithm is able to use precomputed and learned programming to adapt monitoring to a system as it operates, and can aid in predicting component degradation and failure. Bayesian networks also allow ease in representing systems and can integrate historical and experimental data from other devices if needed. The method has been tested in commercial UAVs, but has applications in most complex systems where real time monitoring would be useful.

APPLICATIONS

· UAVs/ drone vehicles
· Complex systems with multiple potential points of failures

ADVANTAGES

· Predictive algorithm can prevent critical failures while in use, whether through degradation or anomalies

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EXTERNAL RESOURCES

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