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A Systematic Approach to Sensor Selection for Aircraft Engine Health Estimation

By Sanjay Garg

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 22 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. A systematic approach for selecting an optimal suite of sensors for on-board aircraft gas turbine engine health estimation is presented. The methodology optimally chooses the engine sensor suite and the model tuning parameter vector to minimize the Kalman filter mean squared estimation error in the engine's health parameters or other unmeasured engine outputs. This technique specifically addresses the underdetermined estimation problem where there are more unknown system health parameters representing degradation than available sensor measurements. This paper presents the theoretical estimation error equations, and describes the optimization approach that is applied to select the sensors and model tuning parameters to minimize these errors. Two different model tuning parameter vector selection approaches are evaluated: the conventional approach of selecting a subset of health parameters to serve as the tuning parameters, and an alternative approach that selects tuning parameters as a linear combination of all health parameters. Results from the application of the technique to an aircraft engine simulation are presented, and compared to those from an alternative sensor selection strategy. This item ships from La Vergne, TN. Paperback.



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