

عنوان مقاله:

Airplane Engine Failures Estimation Based On Kalman Filtering

محل انتشار:

چهاردهمین کنفرانس سالانه مهندسی مکانیک (سال: 1385)

تعداد صفحات اصل مقاله: 8

نویسنده:

Ahmad Ghorbany - PhD student, Academy Member, Shahin Shahr, Malek Ashtar Technology of University, Engine Research Center, Aerospace Department

خلاصه مقاله:

Airlines periodically collect engine data in order to evaluate the failure of the engine components. Kalman filters are often used to estimate the state variables of a dynamic system like an airplane engine. However, in the application of Kalman filters some known signal information is often either ignored or dealt with heuristically. For instance, state-variable constraints (which may be based on physical considerations) are often neglected because they do not fit easily into the structure of the Kalman filter. This paper develops an analytic method of incorporating state-variable inequality constraints in the Kalman filter. The resultant filter is a combination of a standard Kalman filter and a quadratic programming problem. The incorporation of state-variable constraints increases the computational effort of the filter but significantly improves its estimation accuracy. The improvement is proven theoretically and shown via simulation results obtained from application to a turbofan engine model. This model contains 16 state variables, 12 measurements, and 8 component health parameters. It is shown that the new algorithms provide improved performance in this example over unconstrained Kalman filtering.

کلمات کلیدی:

Airplane- Turbofan Engine -Failure Estimation - Constrained Kalman Filtering

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/28039>

