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Fault-tolerant control for constrained linear systems based MPC and FDI. (English)

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Summary: This paper considers fault-tolerant control for constrained linear systems subject to partial actuator failures. An active fault-tolerant control scheme based on Model Predictive Control (MPC) and Fault Detection and Isolation (FDI) is proposed. The FDI module using a two-stage Kalman filtering algorithm provides simultaneous control parameter and state estimation, which are used to modify the MPC formulation such as internal model to accommodate partial actuator failures. The most important advantage of the scheme is that partial actuator failures and input constraints can be dealt with simultaneously. Simulation results show the effectiveness of the proposed method.

MSC:

93E10 Estimation and detection in stochastic control theory

93B35 Sensitivity (robustness)

93E11 Filtering in stochastic control theory

Cited in **5** Documents

Keywords:

fault-tolerant control; model predictive control; fault detection and isolation

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