

Robustness characteristics of active flight control algorithms.

University of Salford - Active Adaptive Control Laboratory



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Application of improved active disturbance rejection control algorithm in tilt quad rotor

Due to the significant changes that occur in the aerodynamics, propulsion, and environmental conditions, and due to the fact that both physics-based models and data-driven models are either inaccurate or too complex, any feedback controller that is introduced in the vehicle has to be suitably advanced.

Model

Below is a video showing the cooperation of two UAVs in order to move an object in a 1 degree of freedom direction.

Manned and Robust Flight Control

The simulation results validate the performance of the adaptive system when the vehicle was subject to a large magnitude of actuator anomaly and plant uncertainties 6 deg dihedral change and 90% actuator effectiveness reduction. This embodies our major vision.

A flight control system for aerial robots: algorithms and experiments

In contrast with an policy, a robust control policy is static, rather than adapting to measurements of variations, the controller is designed to work assuming that certain variables will be unknown but bounded. The longitudinal and vertical acceleration dynamics of the 3-wing VFA is coupled with the dihedral dynamics.

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