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Fault Tolerant Flight Control A Benchmark Challenge

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Fault Tolerant Flight Control A

The European Flight Mechanics Action Group FM-AG(16) on Fault Tolerant Control, established in 2004 and concluded in 2008, represented a collaboration involving thirteen European partners from industry, universities and research establishments under the auspices of the Group for Aeronautical

Fault Tolerant Flight Control - A Benchmark Challenge ...

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Fault Tolerant Flight Control A Benchmark Challenge ...

- the flight control and guidance system should be reconfigurable depending on actuator fault occurrence or aircraft damage, and should be able to avoid obstacles. Fault-tolerant Flight Control and Guidance Systems addresses all of these aspects with a practical approach following three main requirements: being applicable in real-time; highly computationally efficient; and modular.

Fault-tolerant Flight Control and Guidance Systems ...

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Fault-tolerant Flight Control and Guidance Systems ...

In order to improve the safety of hexarotor UAV during flight, a fault-tolerant control scheme independent of basic control law and control distribution is designed in this paper. Firstly, the linear active disturbance rejection control (LADRC) was used as the basic control law for attitude control of hexarotor UAV.

Fault Tolerant Control Algorithm of Hexarotor UAV

An automatic flight control system that enables safe and reliable aircraft flight using a subset of aerodynamic control surfaces. A unique feature is that this subset includes cases where only one aerodynamic control surface is functional.

Fault-Tolerant Aircraft Flight Control - 20150238 ...

In the case of active fault-tolerant control (AFTC), which is the focus of our study, related research works are found mainly in dynamics-oriented studies and control strategy-oriented research. Gautam H. Shah used the wind tunnel to investigate the aerodynamic effects of damage to the primary aircraft control surfaces [11].

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Actuators | Free Full-Text | Active Fault-Tolerant Control

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A distributed adaptive fault-tolerant control (FTC) scheme is proposed by using a distributed sliding-mode estimator, dynamic surface control architecture, neural networks, and disturbance observers. The proposed control scheme can make all trailing fixed-wing UAVs converge to the leading UAV with pre-defined time-varying relative positions even when all trailing UAVs encounter the wake vortices generated by the leading UAV and a portion of trailing UAVs is subjected to the actuator faults.

Distributed adaptive fault-tolerant close formation flight

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Flight control is a promising application area for fault-tolerant control, because aircraft, in addition to being very fully instrumented, usually have some actuator redundancy. Civilian airliners, for example, have spoilers (air brakes) which are sometimes used to provide a rolling moment at low speeds, additional to that available from conventional ailerons.

MPC fault-tolerant flight control case study: flight 1862

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Abstract: Design of fault-tolerant systems is a popular subject in flight control system design. In particular, adaptive control approach has been successful in recovering aircraft in a wide variety of different actuator/sensor failure scenarios. However, if the aircraft goes under a severe actuator failure, control system might not be able to adapt fast enough to changes in the dynamics, which would result in performance degradation or even loss of the aircraft.

Deep Recurrent and Convolutional Networks for Accelerated ...

rithm is established using concepts from loss-of-control. The fault-tolerant controller is designed to operate the single control surface for lateral control and the throttle for total energy control. The fault diagnosis algorithm and the fault-tolerant controller are both designed using a model of the aircraft.

Fault-Tolerant Flight Control Using One Aerodynamic ...

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In this project, we design a set of fault-tolerant control algorithms to stabilize and control a quadrotor with complete loss of one or more rotors in realistic scenarios, such as withstanding significant unmodeled aerodynamic effects in high-speed flights.

Quadrotor Fault Tolerant Flight Control | Sihao Sun

Adaptive-and-Fault-Tolerant-Flight-Control-Systems Synopsis. For flight control systems, this paper proposes an adaptive control approach based on a framework of Explicit Model Following Direct Adaptive Control scheme.

Adaptive-and-Fault-Tolerant-Flight-Control-Systems - GitHub

Abstract: This paper addresses the problem of robust fault-tolerant control of spacecraft attitude stabilization in the presence of model uncertainties, actuator failures, and external disturbances simultaneously. Utilizing the fast nonsingular terminal sliding mode control technique, a novel finite-time extended state observer is first proposed to estimate and compensate for the specified synthetic uncertainties derived from actuator failures and/or model deviations.

Observer-Based Fault-Tolerant Attitude Control for Rigid

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Fault Tolerant Flight Control: A Benchmark Challenge, Lecture Notes in Control and Information Sciences, Vol. 399, Springer-Verlag, Berlin/Heidelberg. Edwards, C. and Spurgeon, S. (1998). Sliding Mode Control, Theory and Applications, Taylor and Francis, London.

A Fault Tolerant Direct Control Allocation Scheme with ...

In this paper, in view of the advantages of widely used Proportional-Integral-Derivative (PID) controller and gain scheduling control strategy in aerospace and industrial applications, a control strategy by using gain scheduling based PID controller is proposed for fault tolerant control (FTC) of a quad-rotor Unmanned Aerial Vehicle (UAV).

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