เอกสารประกอบการสอน
วิชา Control System

ภาควิชาวิศวกรรมไฟฟ้า คณะวิศวกรรมศาสตร์
มหาวิทยาลัยอุบลราชธานี

โดย

ธรรมรส รักธรรม

๙ สิงหาคม พ.ศ. ๒๕๖๐

Abstract

This research develops an adaptive actuator failure compensation framework of robotic systems with parameter uncertainties in addition to actuator failures. The research shows a complete design methodology for developing an actuator failure compensation scheme for robotic systems. The adaptive control design uses an integration of multiple individual failure compensators, which utilizes existing control techniques such as the backstepping control design. With the direct adaptation based on the Lyapunov technique to handle uncertainties in the system, the adaptive actuator failure compensation framework guarantees desired closed-loop stability and asymptotic output tracking, despite actuator failures whose patterns, times and values are all unknown. Simulation results are presented to verify the desired adaptive actuator failure compensation control performances for multiple types of robotic systems from the theoretical cooperative manipulator benchmark system to a more realistic application such as the landing of a helicopter with robotic legs.

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บรรณานุกรม

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