عنوان مقاله:

Nonlinear Multivariable Robust Control of a 3-Axis Flight Motion Simulator

محل انتشار:

بیست و یکمین کنفرانس مهندسی برق ایران (سال: 1392)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Flight motion simulators are used to simulate the movements of flying objects in the laboratory. A flight motion simulator is a multivariable nonlinear system that has threeinputs and three outputs. In most of control methods proposed for this type of table, linearization is first performed and thenlinear control methods are used to deal with the problem of these systems' nonlinear nature. Besides, to deal with the problem of these systems' multivariable nature, this system canbe considered as a three single input-single output system regardless of the coupling of gimbals and minimization of itseffects. In this paper, unlike previous research, the full dynamic equations of a 3-DOF flight motion simulator are used as a realsystem, which include the effects of wobble, unbalancy, nonorthogonality of axes and gravity terms. Due to the uncertainty in the equations of system, robust controllers are suitable forthe control of such systems. In this paper, two nonlinear multivariable control methods are used to control the 3-DOFsystem: inverse dynamic and robust inverse dynamic control. The result of applying these methods to the system has beenobserved in the presence of external disturbances, to verify the efficiency of the proposed control systems

کلمات کلیدی:

Flight Motion Simulator, Nonlinear Multivariable Systems, Inverse Dynamic Control, Robust Inverse Dynamic Control