

عنوان مقاله:

Combination of Sliding Mode and Fuzzy Controllers on a Quadrotor Hardware-in-the-Loop Setup

محل انتشار:

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خلاصه مقاله:

A control system which is a combination of the sliding mode and fuzzy controllers is designed and described in this paper to control the attitude and position of a real quadrotor. Because of some uncertainties in the real situations, such as estimation of the thrust forces, geometrical parameters, existence of unknown resisting forces and torques, and nonlinearity of the quadrotor, the classical controllers don't have the ability to eliminate most of the errors. So, two types of controllers that have better response in these situations are proposed. Toward this objective, after the extraction of the dynamic equation of a quadrotor, the performances of these controllers are compared on a hardware-in-the-loop test bed in term of attitude. The experimental results show that the sliding mode control has faster response and the fuzzy control is more accurate to track a desired trajectory. So, here sliding mode and fuzzy control are used to control the attitude and translational position of the quadrotor, respectively. This method is implemented on a test bed to show the possibility of trajectory control with the proposed controller to apply it on a real flying quadrotor. The results show the adequate response of this control strategy to track the desired trajectory in 3D space.

کلمات کلیدی:

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