عنوان مقاله:

Fuzzy Sliding Mode for Spacecraft Formation Control in Eccentric Orbits

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خلاصه مقاله:

The problem of relative motion control for spacecraft formation flying in eccentric orbits is considered in this paper. Due to the presence of nonlinear dynamics and external disturbances, a robust fuzzy sliding mode controller is developed. The slopes of sliding surfaces of the conventional sliding mode controller are tuned according to error states using a fuzzy logic and reach the pre-defined slopes. The controller is designed based on the nonlinear model of relative motion and perturbation and atmospheric drag are considered as external disturbances. Using the Lyapunov second method, the stability of the closed-loop system is guaranteed. The performance of the presented controller in tracking the desired reference trajectory is compared to a sliding mode controller in which simulation results confirm the superior performance of the proposed controller.

کلمات کلیدی:

Sliding mode, Control, spacecraft formation flying, eccentric orbits, Fuzzy

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