Abstract

In this paper, a robust attitude control algorithm is developed based on sliding mode control for a satellite using four reaction wheels in a tetrahedron configuration. In this method, asymptotic stability of the proposed algorithm has been proven on Lyapunov theory. Then, in order to evaluate the performance of the proposed algorithm, a low-cost real-time software in the loop test bed is provided. The presented test bed is capable of real-time assessing the attitude sliding mode control algorithm. In this test bed, real-time modeling of satellite dynamic, environmental disturbances and reaction wheels are achieved in a simulator computer and the proposed control algorithm performance is investigated by implementing it in an electronic control board of the software in the loop test bed.

References

Design and Implementation of a Sliding Mode Attitude Controller of a Satellite in Software in the Loop Test Bed

 Technologies (RAST), Istanbul, Turkiye.

Index Terms
Keywords
Attitude Control; Reaction wheel; Satellite; Sliding Mode; Software in the loop