

عنوان مقاله:

Adaptive Hybrid Suppression Control of a Space Robot with Active Flexible Members

محل انتشار:

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خلاصه مقاله:

A new control algorithm for an object manipulation task by a space robotic system with flexible members is studied here. Flexible members such as solar panels of space free flying robotic systems and their flexible joints during a maneuver may get stimulated and vibrate. Therefore, such vibrations will cause some oscillatory disturbance forces on the moving base and manipulated object, which in turn produces error in the position and speed of the manipulating end-effectors. To encounter these flexibility effects, it is assumed that these members are activated. In this paper, first the system dynamics is partitioned into two rigid and flexible bodies' motion, and an applied model for control implementations on compounded rigid-flexible multi-body systems is developed. Then, based on a designed path/trajectory for a space robotic system, the Adaptive Hybrid Suppression Control (AHSC) is applied to perform an object manipulation task by such complicated rigid-flexible multi-body systems. Finally, a space free flying robotic system is simulated which contains two 2-DOF planar manipulators with flexible joints, and a rotating antenna and a camera as its third and fourth arm, appended with two solar panels. Obtained results reveal the merits of the proposed model and improved controller.

کلمات کلیدی:

Space Robot - Adaptive Hybrid Suppression Control – Object Manipulation - Flexibility

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