

Paper Review:

Tracking Control for the Grasping of a Non-cooperative Tumbling Satellite with a Free-Floating Robot

This paper presents tracking control for the grasping of a non-cooperative tumbling target. The developed control method is validated with hardware-in-the-loop(HILS) simulator, which can simulate gravity-free dynamics motion. The research topic itself has very long history in the field of space robot. Because the number of facilities of HILS itself for the space activity is very few, it is worth demonstrating the proposed control method in the HILS. However, it is very difficult to find out novelty of the tracking control method proposed in this paper. It is better to emphasize academic contribution of this paper.

The presentation of the paper is well-written. However, some parts are vague in the paper. The meaning of eq. (19) is unclear. The equation (19) says that the total momentum of Chaser and robot arm is equal to the target. From the equation, it is difficult to understand the LLWR includes target inertia after the grasping. The paper only treats with tracking, however, after rigidization, the external force and torque on the end-effector should be important. It should be discussed in the paper.