

Editorial

To improve capabilities for space exploration, it is important to develop on-orbit servicing. Technical challenges, such as capturing a tumbling satellite and operating in a confined space, complicate the servicing of non-cooperative satellites. In consideration of the challenge, to perform complicated tasks in space, novel mechanisms for applications are in great demand. Meanwhile, as mechanisms become more complicated, control technology should be investigated accordingly. The question of how to ensure reliability and high performance in a complex environment is now an important consideration. This issue focuses on space flexible manipulation and control for on-orbit servicing, covering a broad spectrum of research in fields of bio-intelligence, novel mechanisms, motion planning and control technology, and target acquisition schemes. The issue includes the following four invited and contributed papers:

1) An overview of the configuration and manipulation of soft robotics for on-orbit servicing: The paper gives a comprehensive review of the configuration and manipulation of soft robotics alongside a discussion of actuation and control of manipulation. A hybrid configuration and manipulation of space soft robots for on-orbit servicing are proposed, and some challenges for future research are given.

2) Two performance enhanced control of flexible-link manipulator with system uncertainty and disturbances: This paper is aiming at precision of flexible-link manipulator using the composite learning control and disturbance observer based control to efficiently deal with system uncertainty and time-varying disturbance.

3) Vibration suppression of a large flexible spacecraft for on-orbit operation: This paper presents a hybrid control strategy for controlling the motion of a manipulator while suppressing the vibration of appendages for a large flexible spacecraft in-orbit operation.

4) Analysis and design of parameters in soft docking of micro/small satellites: This paper analyzes the soft docking model of micro/small satellites and evaluation criteria of a successful docking are defined by considering the operating principle of the capturing mechanism.

Finally, we would like to express our sincere appreciation to all the authors for submitting their manuscripts to this special focus and our gratitude to all the anonymous reviewers for delivering high-quality and timely comments.

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