ICRA '08 Space Robotics Workshops (Orbital Robotics)

Workshop Call for Participation

Organized by Rick Wagner (Northrop Grumman Space Technology), Corresponding Chairman, Space Robotics TC.

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Abstract

This full day workshop on robots in space (as distinguished from planetary robotics) is proposed by the IEEE RAS TC on Space Robotics and it will be a good complement to Richard Volpe's proposed full day Planetary Rover Workshop. Robots can help astronauts in space by reducing astronaut extra-vehicular activity (EVA) time by performing tasks that otherwise would be performed by astronauts, and by assisting astronauts during EVA. As space exploration mission durations increase, the need to reduce astronaut workload increases. Inspection, maintenance, and repair in space become more important for long duration space travel, such as for missions to the Moon and Mars. This workshop will illuminate issues and potential solutions to the unique problems of robots in the zero-gravity, vacuum, and radiation environment of space. Associated topics include human-robot interfaces, robot-robot cooperation, zero-gravity locomotion, free flier robot navigation and docking, and robotic inspection and repair of space vehicles.

Motivation and Objectives

Robotic assistance to astronauts in space has an enormous and almost untapped potential to facilitate space exploration. Reductions in EVA time for astronauts not only reduce astronaut workload, but lead to reduced mass for space suits, spare parts, and consumables. This workshop will bring together the latest approaches to reaping these potential benefits for space exploration programs of nations all over the world. In addition, un-crewed vehicle operations are also augmented and enabled by robotics.

List of Topics

- Legged locomotion in zero-gravity and grippers (sticky, electrostatic, etc.)
- Space robotics algorithms
- Manipulation in space
- Free flier robot attitude control and space docking
- Mission design for robotics in space

- Human-robot and robot-robot communication in and around crewed and uncrewed space vehicles
- Space robotics industrial processes

List of Presenters

Additional presenters will be accommodated as time allows. Time slots will not be reduced to less than 20 minutes. Potential presenters are encouraged to submit abstracts by January 15, 2008.

Time	Presenter and Topic
09:00-09:30	**Welcome and Introduction** Rick Wagner, Chairman, Space Robotics TC TBD
09:30-10:00	**Keynote Speaker** **Title TBD** **Speaker TBD**
10:00-10:30	Electrostatic and Sticky Gripper Test Results (confirmed) Rick Wagner, Northrop Grumman Space Technology, USA
10:30-11:00	(confirmed) Marcello Romano (Naval Postgraduate School), et al., USA
11:00-11:30	(confirmed) Brian Wilcox (Jet Propulsion Laboratory), et al., USA
11:30-13:30	**Lunch Break**
13:30-14:00	(confirmed) Kazuya Yoshida (Tohoku University), et al., Japan
14:00-14:30	(confirmed) Dimi Apostolopoulos (Carnegie-Mellon University), et al., USA
14:30-15:00	Grasping of a Non-Cooperative Target (confirmed) Steven Dubowski (Massachusetts Institute of Technology), et al., USA
15:00-15:30	(confirmed) Roberto Lampariello(DLR), et al., Germany
15:30-16:00	**Open Discussion** All

Intended Audience

The workshop will be of interest to both space robotics researchers and applications developers. Researchers working in the areas of robot architectures for space, cooperative robotics, teleoperation, and zero gravity locomotion should find this workshop particularly valuable. Designers of space power and thermal systems as applied to robotics and space system engineers should also find this workshop of interest.

Relation To Previous ICRA Workshop

The ICRA ’07 full day Space Robotics Workshop covered both planetary rovers and orbital robotics and was well attended and well received. It was the consensus of the attendees that we not only repeat the workshop at ICRA ’08, but expand it if possible. To that end, Richard Volpe (My Co-Chair of the Space Robotics TC) is proposing a full day planetary rover workshop. A survey of potential contributors to this proposed orbital robotics workshop shows that we will not only fill a full day, but will probably have to squeeze some presentations in.

OrbitalRobotics08.html
URL: http://teamster.usc.edu/~fixture/Robotics/SpaceRoboticsTC/OrbitalRobotics08.html
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