



Orbital Robotics Workshop

ICRA 2008

Pasadena, California, USA

Space Robotics Technical Committee

Orbital Robotics Workshop

- 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.

Agenda

Time	Presenter and Topic
09:00-09:30	Welcome and Introduction Rick Wagner, Chairman, Space Robotics TC
09:30-10:00	Keynote Speaker David Akin (University of Maryland, USA)
10:00-10:30	Grippers for Space Locomotion Rick Wagner (Northrop Grumman Space Technology, USA)
10:30-11:00	Morning Break
11:00-11:30	Recent Research Developments on Spacecraft Proximity Dynamics and Control at the Spacecraft Robotics Laboratory Marcello Romano, Riccardo Bevilacqua, Jason Hall, and Paul Oppenheimer (Naval Postgraduate School, USA)
11:30-12:00	Modeling of Impact Dynamics and Impedance Control for Soft Grasp of a Floating Target Kazuya Yoshida and Hiroki Nakanishi (Tohoku University, Japan)
12:00-12:30	Hyper-R: A Flexible, Packable, Space Robotic Arm Peter Will (University of Southern California, USA)
12:30-14:00	Lunch Break
14:00-14:30	ROKVISS: Verification of Advanced Light Weight Robotic Joints and Tele-Presence Concepts for Future Space Missions Klaus Landzettel, Alin Albu-Schäffer, Bernhard Brunner, Alexander Beyer, Erich Krämer, Carsten Preusche, Detlef Reintsema, Bernhard-Michael Steinmetz, Hans-Jürgen Sedlmayr, and Gerd Hirzinger (DLR Oberpfaffenhofen, Institute of Robotics and Mechatronics, Germany)
14:30-15:00	Planning and Control of Space Robotic Systems on Orbit Evangelos Papadopoulos and Ioannis Tortopidis (National Technical University of Athens, Greece)
15:00-15:30	The Programming and Training of a Multitasking Sensory Motor Controlled EVA-Robot Operating In a Zero-g Environment Alan Rosen and David B. Rosen (Machine Consciousness, USA)
15:30-16:00	Afternoon Break
16:00-17:00	Open Discussion All