Seminar announcement

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Adaptive Distributed Systems for Space Exploration: Present and Future

Dr. Marco QUADRELLI, Jet Propulsion Laboratory, Caltech

NASA JPL

Sept. 7th 2015, 11h-12h
EPFL - BC420
Free admission

In this talk, Dr. Quadrelli will emphasize the need for adaptivity in four key categories of distributed autonomous systems for space exploration (Multiple, Multi-physics, Mission-level, Multi-scale). One category has to do with adaptivity and system reconfigurations in robotic exploration of extreme environments with multiple assets. Another category deals with adaptivity by exploiting the material multi-physics interactions in the physical implementation for robotic manipulation tasks. Another category deals with mission-level adaptivity, and the best example of this is a complex space system interacting with the atmosphere until it lands autonomously on the surface. Finally, the last category deals with multi-scale system adaptivity that enables space science, through an innovative re-thinking of the way space science missions are done today.

Bio

Dr. Quadrelli is an internationally renowned expert in modeling for dynamics and control of complex space systems. He has a Laurea degree in Mechanical Engineering from Padova, a Masters Degree in Aeronautics and Astronautics from MIT and a PhD in Aerospace Engineering from Georgia Tech. He was a visiting scientist at the Harvard-Smithsonian Center for Astrophysics, at the Institute for Paper Science and Technology, and a lecturer at the Caltech Graduate Aeronautical Laboratories.
After joining NASA JPL in 1997 he has contributed to a number of flight projects including the Cassini-Huygens Probe, Deep Space One, the Mars Aerobot Test Program, the Mars Exploration Rovers, the Space Interferometry Mission, the Autonomous Rendezvous Experiment, and the Mars Science Laboratory, among others. He has been the Attitude Control lead of the Jupiter Icy Moons Orbiter Project, and the Integrated Modeling Task Manager for the Laser Interferometer Space Antenna. He has led or participated in several independent research and development projects in the areas of computational micromechanics, dynamics and control of tethered space systems, formation flying, inflatable apertures, hypersonic entry, precision landing, flexible multibody dynamics, guidance, navigation and control of spacecraft swarms, terramechanics, and precision pointing for optical systems. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics, a NASA Institute of Advanced Concepts Fellow, an Accademia Nazionale dei Lincei Fellow, and a Caltech/Keck Institute for Space Studies Fellow.

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