

RAS Chapter (Washington Section) Guest Speaker Series

Space Robotics for Science and Exploration on Planetary Surfaces

Dr. Edward Tunstel

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Location:

Univ. of Maryland, College
Park, Kim Engineering Bldg.
(PepCo Rm. #1105)

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Abstract

The first half-century of space exploration has seen significant accomplishments by robotic spacecraft that have flown by and orbited planets throughout our solar system. Current and future phases of space science and exploration have a major focus on landing and operating robots on planetary surfaces. This talk provides an overview of some of the robotics technologies receiving attention today to enable needed capabilities for current and future missions on the surfaces of other planets. The representative state of the art on missions operating today will be touched on including Mars rover mechanisms for mobility and manipulator placement of science instruments, autonomous navigation and related sensor-based perception, and the semi-autonomous operation of rovers from Earth. Future challenges will also be highlighted in the context of advanced applications that will require robots to perform work on planet surfaces alone, with other robots, or with/for astronauts.

Speaker Biography

Dr. Tunstel joined the Johns Hopkins University Applied Physics Laboratory in the fall of 2007 where he is working as a Space Robotics and Autonomous Control Lead in its Space Department. Before joining APL he was the Advanced Robotic Controls Group Leader at NASA's Jet Propulsion Laboratory where he developed autonomous control and navigation algorithms, software, and systems for robotics research and space flight projects for 18 years. His most recent project was the Mars Exploration Rovers mission for which he served as a flight systems engineer for autonomous rover navigation and, more recently, as the mobility and robotic arm subsystem lead for surface mission operations. Dr. Tunstel earned B.S. and M.E. degrees in mechanical engineering at Howard University, Washington, DC and the Ph.D. in electrical engineering at the University of New Mexico. He has authored over 110 refereed publications in journals and conferences and co-edited 3 books, including "Intelligence for Space Robotics" published in 2006. Dr. Tunstel is a senior member of IEEE, IEEE SMC Society Vice President for Conference & Meetings, and Chief Technologist of the NSBE Space Special Interest Group. He is active in the IEEE RAS TC on Space Robotics and IEEE SMCS TC on Robotics & Intelligent Sensing.

