New!

INTELLIGENCE FOR SPACE ROBOTICS

Summer 2006

Edited By

Ayanna M. Howard
Georgia Institute of Technology

Edward W. Tunstel
NASA Jet Propulsion Laboratory

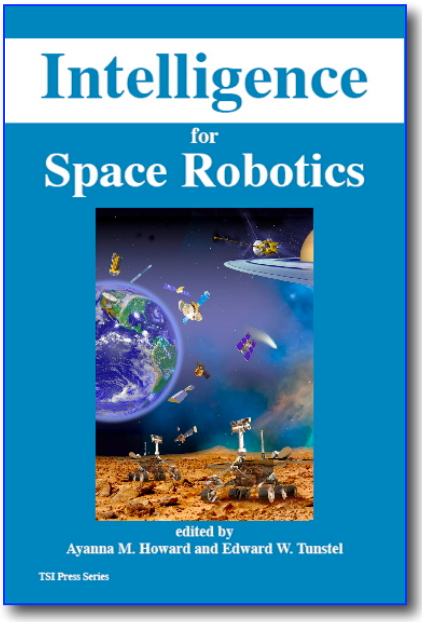
FOR SPACE CONNOISSEURS AND RESEARCHERS ALIKE

Space exploration missions employ robots, instrumented with a variety of sensors and tools, on remote planetary surfaces, on orbit, or as assistants to astronauts. The utility of space robots is a function of their ability to move about, perform work, and explore intelligently without frequent contact with, or strong reliance on, human operators. This requires capabilities for sensing and perception of surrounding unstructured or uncharted environments. It also requires intelligent reasoning about perceptions to perform tasks in a purposeful and reliable manner in such environments. As such, robotic intelligence or autonomy is closely related to success of space missions involving robots and automated space systems. With the increasing successes of robotic missions by space agencies worldwide, robot autonomy technology has boldly confronted the challenging proving grounds of space and its planetary surfaces, further demonstrating its utility and practicality with each mission. The need for intelligent space robots has increased as well, and will continue to increase with the ever-challenging pursuits of the international space agencies requiring teams of humans and smart robots.

Space missions present unique robotics challenges. Advanced autonomy must function reliably and within strict limitations on data processing and computational hardware resources while also dealing with effects of challenging space environments. ***Intelligence for Space Robotics*** addresses a broad range of relevant topics, focusing on the use of intelligent sensing and computing techniques for addressing space robotics problems. The authors, who are experts in their respective application domains, present cutting-edge and emerging technologies, space mission scenarios, and results of recent applications of robotic intelligence in space and in laboratories worldwide.

FEATURES

- Provides an in-depth overview of practical sensor-based and computer-based intelligence techniques for addressing space robotics problems.
- Offers an international perspective with contributions from roboticists at Space Agencies and affiliated Universities located around the world.
- Conveys the state of the art and future directions in a manner equally suited for space robotics experts as well as engineering and science students.
- Presents a cross-section of robotic intelligence applied in practice and under development for future space missions.



CHAPTERS

TSI Press (http://www.wacong.com/tsi.html), 2006