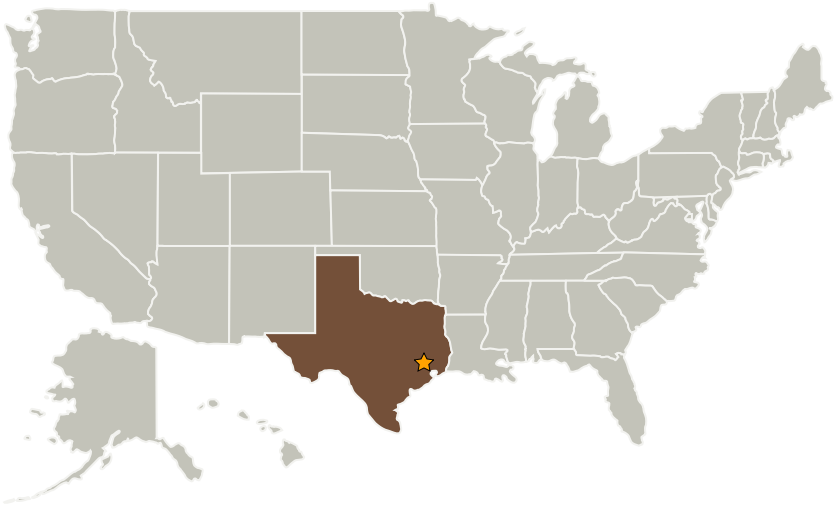
Model-Based Resource and Mode Management for Lunar Surface Operations, Phase I

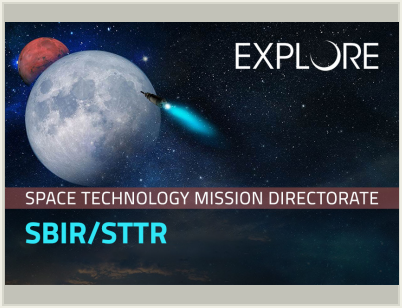
Completed Technology Project (2008 - 2008)

Project Introduction

The proposed project is aimed at developing a model based resource and mode management system for space robotics systems that will allow real time assessment of resources status and provide required situational awareness to execute efficiently the mission. Traditionally, resource management is being done remotely by the robotics operations team. This approach has numerous disadvantages. For instance, it does not support a more autonomous operation, it takes a longer time to complete than potentially available when the decision has to be made in real time, it has the high costs associated with a large operating team, continuously working for mission support. Ideally, such a function should be part of a full Integrated System Health Management (ISHM), but while a lot of research is being done on the development of ISHM systems, very little effort is made to provide the robot with the capability to use system information to assess the possible strategies with respect to the remaining resources of the vehicle. A model based system can use its understanding of the system state, of its operational modes and of its resource usage to deduce the potential optimum strategies in order to achieve the mission goals.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Tietronix Software, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Houston, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Michel E Izygon

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  └ TX13.4 Mission Success Technologies
    └ TX13.4.3 High-Fidelity Simulation and Visualization