

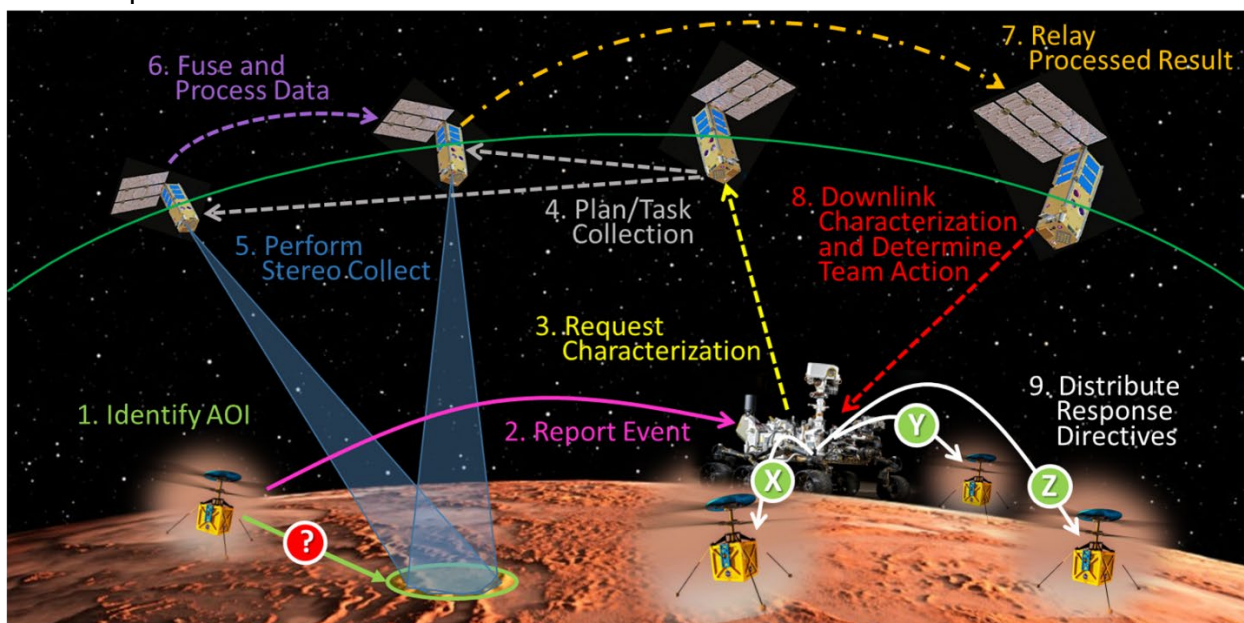
Press Release: Orbit Logic Tackles Autonomous Planning of Martian Swarms

GREENBELT, MD (April 16, 2020) – Orbit Logic has been awarded a Phase I Small Business Technology Transfer (STTR) contract sponsored by the National Aeronautics and Space Administration (NASA) to develop the Mars/Interplanetary Swarm Design and Evaluation Framework (MISDEF) System – an autonomous planning architecture supporting collaborative satisfaction of science needs by orbital (satellite), surface (rover) and atmospheric (drone) assets. The solution is being developed in partnership with the University of Colorado Boulder (CU).

Orbit Logic’s existing Autonomous Planning System (APS) is the foundation of the architecture, providing asset level resource planning based upon information contained within a Common Relevant Operating Picture (CROP) module, whose contents are shared across the entire team during communication opportunities.

CU’s Event-Triggered Decentralized Data Fusion (ET-DDF) algorithm is employed to maintain the CROP’s shared state knowledge with minimal (and in some cases zero) data exchange. This allows the team to collectively work toward satisfaction of mission goals with high assurance that the plans employed by each asset will be de-conflicted. Multi-factor figure-of-merit scoring of the activities that each asset plans to undertake are distributed via the CROP as well, facilitating a fully-scalable and decentralized approach to selection – assets with lower scores can stand-down on that activity and re-plan to accommodate other mission needs.

CU’s Mars Robotic Asset Cooperative Control (MRACC) algorithm is being utilized as an APS Specialized Autonomous Planning Agent (SAPA) to solve the distributed information gathering problems posed by many applications of robotic swarming strategies. The graphic below depicts an example mission scenario, where meeting a science objective can consist of detecting an ad-hoc event and orchestrating the use of multiple vehicles and sensor types to perform follow-up and data processing on multiple nodes to arrive at the final set of science artifacts.



MISDEF Example Mission Concept Showing Key Interactions Between Swarm

About Orbit Logic

Orbit Logic (www.orbitlogic.com) specializes in mission planning and scheduling solutions for aerospace and geospatial intelligence. Orbit Logic's operationally proven COTS products create better plans faster with fewer resources for all mission phases. Orbit Logic services are available to configure, customize, and integrate Orbit Logic's mobile, web-based, desktop, and flight software applications to provide turn-key operational solutions that leverage the latest available technologies to meet customer goals and exceed their expectations.