

Press Release: Orbit Logic Continues Development on Autonomy for Satellite Self Protection

GREENBELT, MD (November 18, 2021) – Orbit Logic has been awarded a four-year Space Technology Advanced Research (STAR) Advanced Research Announcement (ARA) contract by the Air Force Research Laboratory (AFRL) to develop and mature onboard satellite software, the Autonomous Decision Engine (ADE), in support of the Satellite Fusion, Inference and Response Engine (SaFIRE) program. The ADE will enable onboard data collection and fusion for enhanced local area space situational/domain awareness (SSA/SDA) as well as onboard decision making to act autonomously in the interest of satellite self-protection. It is a complete closed-loop solution that processes raw observation data into intelligent decisions about evasive maneuvers and/or additional data collection.

The ADE will be built on Orbit Logic’s Autonomous Planning System (APS) onboard planning/response framework. The flexible APS autonomy architecture enables capabilities such as tracking of Resident Space Objects (RSOs), behavior inference of those RSOs, and autonomous satellite response logic. Responsive actions include reactive maneuvers, threat event-cued local area search, and local observation tasking; APS will plan all these actions and deconflict all resource utilization. Moreover, APS enables collaborative autonomy so that the satellite can coordinate with other space- or ground-based sensors for them to collect additional data to refine its RSO tracking and threat assessment in order to make more informed response decisions.

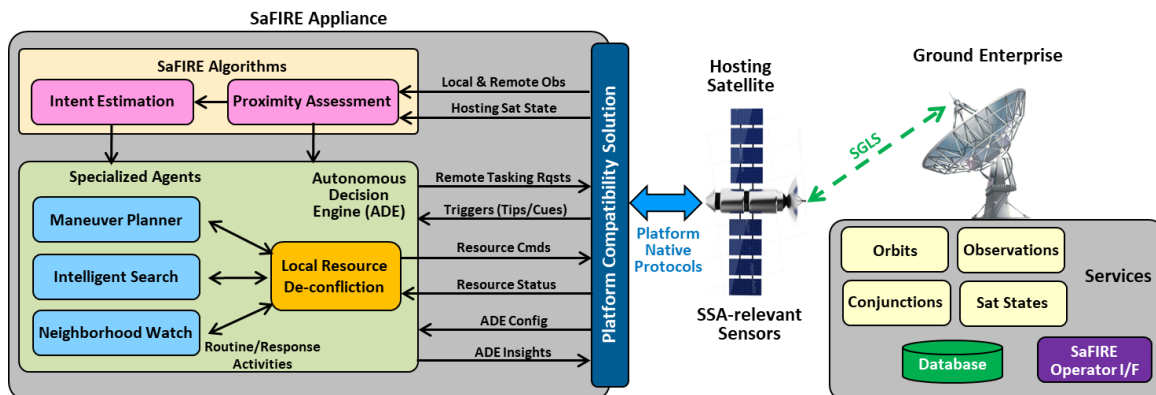


Figure 1. ADE Architecture and Relationship to Wider System.

This contract is one avenue by which APS – a technology created under an AFRL SBIR contract and matured in work with AFRL, ONR, DARPA, and NASA – has transitioned from an elementary research and development technology to a deployed commercial solution; it is deployed on-orbit on a satellite launched in June 2021 and will fly again on an upcoming satellite mission in 2022. Beyond satellite self-protection and local SSA, APS can be leveraged for autonomous planning in *any* domain. Other notable deployments of APS include for the autonomous operation of heterogeneous constellations of [Low Earth Orbit \(LEO\) satellites with DARPA](#)¹, heterogeneous teams of [unmanned underwater/surface/aerial vehicles \(UUVs/USVs/UAVs\) with the Navy](#)², heterogeneous swarms of [rovers, satellites, and atmospheric vehicles for robotic Mars exploration](#)³, and [heterogeneous robotic swarms with astronauts-in-the-loop for Lunar exploration](#)⁴ with NASA.

¹ Orbit Logic’s Autonomous Planning System for the DARPA Blackjack Pitboss Program
<http://orbitlogic.com/uploads/5/7/8/8/57881343/20200206%20Blackjack%20Press%20Release%20Final.pdf>

² Orbit Logic’s Navy Phase II SBIR, Robust Cooperative Autonomy with Minimal Information Exchange (MinAu)
<http://orbitlogic.com/uploads/5/7/8/8/57881343/20190709%20MinAu%20Navy%20Phase%20I%20Press%20Release%20Final.pdf>

³ Orbit Logic’s NASA STTR, Mars/Interplanetary Swarm Design and Evaluation Framework (MISDEF)
<http://orbitlogic.com/uploads/5/7/8/8/57881343/20200416%20MISDEF%20Phase%20I%20Press%20Release.pdf>

⁴ Orbit Logic’s Intelligent Navigation, Planning, and Awareness for Swarm Systems (IN-PASS) solution
<http://www.orbitlogic.com/uploads/docs/20210208%20IN-PASS%20Phase%20I%20Press%20Release.pdf>

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.