Booz Allen | i2S2 intelligent, integrated SDA-STM

INTEGRATED, INTELLIGENT SPACE DOMAIN AWARENESS–SPACE TRAFFIC MANAGEMENT (i2S2)

INTERACTIVE AI FOR SPACE

Accelerate space situational awareness (SSA) with i2S2, a cloud-based space domain awareness-space traffic management (SDA-STM) solution that uses AI and machine learning (AI/ML) to continually fuse space and threat data. Operators receive low-latency, high-fidelity alerts—giving them time to choose from a wide range of courses of action for safety, avoidance, deterrence, and defense.

As the space domain becomes increasingly contested and the number of space objects skyrockets, the challenge of managing space assets, preventing collisions, and determining intent grows ever more critical. Government and commercial space organizations must rapidly gain the ability to coordinate SDA-STM efforts with speed, accuracy, efficiency, and precision.

i2S2 SOLVES CRITICAL PROBLEMS ASSOCIATED WITH SPACE DATA, INCLUDING:

- **Integrated**—greater integration and fusion of space object and threat data (multi-orbit, multi-sensor, multi-source) for comprehensive awareness
- **Accurate**—incorporation of space weather/drag modeling, and world class propagation/conjunction tools for pinpoint orbit determination
- **Automated/Intelligent**—pioneering the use of AI for highly accurate assessment of space events/threats, automated decision support, and visualization
- **Scalable**—leveraging modular, open architecture frameworks using cloud agnostic platforms to address the increasing volume of space assets, constellations, and debris

ENHANCED SPACE DOMAIN AWARENESS AND STRATEGIC ADVANTAGE

By securely networking large language models (LLMs) that collaborate and learn from each other, i2S2 provides comprehensive insights into space behaviors and threats by combining AI models that utilize astrodynamics and SDA-STM analysis capabilities. Operators receive information and recommendations with a conversational interface. The interconnected system of LLMs, chatbots, and humans speeds critical decision making and improves accuracy.

ADVANTAGES

- **AI-powered analysis—**rapid, continual evaluation accelerates space situational awareness
- **Intelligent automation—**AI/ML techniques deliver a full range of courses of action with superior accuracy
- **Cross-domain sharing—**ability to securely deliver outcomes from data at all classification levels
- **Industry-leading cybersecurity—**robust, resilient platform has built-in security with zero trust
- **Cloud-enabled mobility—**can run on portable devices (laptop/smart phone) using Booz Allen's cloud-based, scalable, tailorable platform (BASE-C)

FEATURES

MULTI-PHENOMENOLOGY DATA INTEGRATION

i2S2 creates an accurate SSA picture by ingesting the most recent SDA-STM observation and space environment data from commercial and government sources. It then overlays that data with threat intelligence and the most recent owner/operator ephemeris and vehicle state data, and maneuver plans.

PROPAGATION MODELING

i2S2 ingests SSA data and executes high-fidelity propagation models that incorporate near real-time drag predictions by combining state-of-the-art, atmospheric density models with current space weather conditions—increasing accuracy while reducing false alerts.

ASSESSMENT AND ALERT

A continuous low-latency space awareness assessment and alert service performs conjunction screening, risk assessment, and pattern of life analysis to warn operators of space environment conditions, conjunctions, launch activities, reentry events, and adversary actions. SSA sensor tasking capabilities obtain further observations, reducing threat risks.

AI/ML PREDICTIVE ANALYSIS

AI/ML techniques use LLMs; for example, a generative pre-trained transformer (GPT) engine for predictive analytics. To provide comprehensive space situational awareness, generative AI engines receive inputs of varied data types such as electro-optical (EO), radio frequency (RF), and intelligence databases. These data types are fed into machine learning algorithms and LLMs that automatically generate courses of action, provide consequence of selected action(s), and will eventually provide intent of threats given the fusion of information.

PATTERN OF LIFE/COURSES OF ACTION (COAs)

i2S2 assesses historical operations of each spacecraft to flag maneuvers related to orbit modification and/or spacecraft activity using machine leaning algorithms, providing a holistic view of global satellite operations with probable present and future interactions. i2S2's low-latency continuous assessment gives owners/operators extra time to consider COA options.

About Booz Allen

Trusted to transform missions with tomorrow's technologies, Booz Allen Hamilton combines AI and cybersecurity with leading-edge technology and engineering solutions to realize our purpose: **Empower People to Change the World®.**

For more information visit **BoozAllen.com/Space**

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