

Ground System Architectures Workshop

Stronger Together: Improving Interoperability for Users and Operations

February 22–March 2, 2023 | The Aerospace Corporation | El Segundo | California

Workshop E: Intelligent Systems and Machine Learning for Space Ground Systems

***Leads: Nicholas Perlongo and Andrew
Gilbertson, The Aerospace Corporation***

A satellite in orbit with solar panels and a ground station with a large parabolic dish antenna.

Agenda

- Introduction
- Presentations
 - *Dr. Seung Chung – “Autonomy & Automation in Deep Space Mission Operations” (Jet Propulsion Laboratory)*
 - *Dr. Klara Nahrstedt (University of Illinois)*
 - *Renee Yazdi – “A Machine Learning Toolset for PNT Threat Detection and Response” (Canyon Consulting)*
 - *Dr. Phil Slingerland (The Aerospace Corporation)*
- Break
- Panel Discussion
 - *Dr. Nick Perlongo – Moderator (The Aerospace Corporation)*
 - *Dr. Philip Feldman (ASRC Federal)*
 - *Dr. Seung Chung (JPL)*
 - *Scott Leonard (NOAA)*
 - *Dr. Christopher Lawson (The Aerospace Corporation)*



Session Focus

- Adaptive, reliable automation and intelligent decision making are essential for the success of our space ground systems.
- One big challenge is migrating capabilities out of the lab to supporting critical mission operations. In the past, these approaches were often misunderstood, misapplied, too complex or costly to sustain, or insufficient for mission needs.
- Applied intelligent systems and machine learning technologies have begun to address this challenge through self-evolving, efficient, and value-focused capabilities. In addition, un-realized opportunities exist for applying established, or rapidly emerging technologies, solutions and architectures to the area of ground system space control and mission processing.
- Explore these areas through a series of presentations and an interactive panel discussion



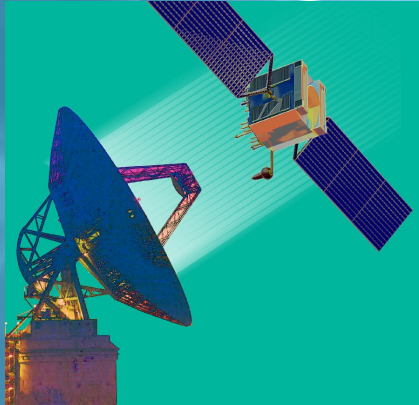
Session Themes

- Where do intelligent systems and machine learning currently exist in space ground systems?
- What underlying parts of the space ground systems, enterprise and operations are suited to intelligent systems and machine learning?
- What emerging capabilities and technologies are being developed in the community?
- What are real-world impediments for adoption in operations?
- What capability and technology gaps exist and might seed further research and investment?
- How have program dealt with end user trust and acceptance of planned intelligent and machine learning systems for space ground systems?
- What is the nature of the intersection of reliable autonomy and trusted AI, and how is this related to machine learning operations (MLOPs)?



Presenters

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- *Dr. Klara Nahrstedt (University of Illinois)*
- *Renee Yazdi – “A Machine Learning Toolset for PNT Threat Detection and Response” (Canyon Consulting)*
- *Dr. Phil Slingerland – “Aerospace’s Trusted AI Framework” (The Aerospace Corporation)*



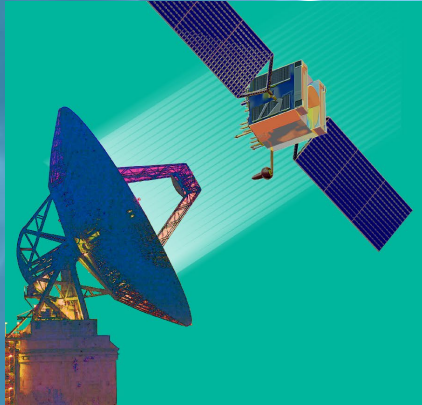
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Questions?





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Break

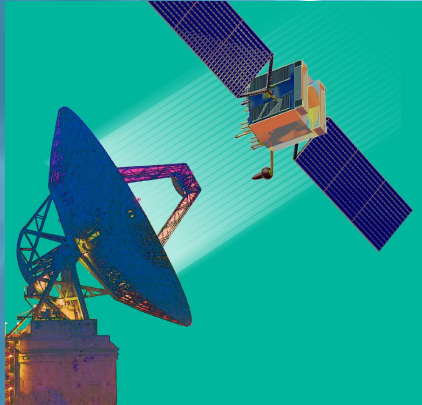




Panel Discussion

Panelists

- Dr. Nick Perlongo – Moderator (The Aerospace Corporation)
- Dr. Philip Feldman (ASRC Federal)
- Dr. Seung Chung (JPL)
- Scott Leonard (NOAA)
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Thank you