DAAS: Data Analytics for Assurance of Safety, Phase I Project

SBIR/STTR Programs | Space Technology Mission Directorate (STMD)

ABSTRACT

Assuring safe operations in the National Airspace (NAS) encompasses monitoring a variety of systems simultaneously and in real time. It is helpful to imagine NAS as a system of systems where each system loosely interacts with the other. Under this paradigm, an aircraft is a system, so is an airline and as is an airport. Automating safety assurance for each of these systems would involve monitoring an array of sensors each with a different time cycle and reporting characteristics and processing enormous amounts of data. Given the complexing of NAS, it is unlikely that any one tool could provide a solution. Instead, a number of tools each monitoring a smaller, more manageable part of the NAS, all the while sharing information with each other, seem more promising. In the future these tools would ensure airborne separation assurance, track Air Traffic Control (ATC) guidance conformance and ensure safe ground operations. DAAS is an architecture to support these very needs. It forms the basis of a network of smaller, more focused, safety assurance tools that share information and data through a central Big Data repository that is mined using advanced machine learning algorithms.

ANTICIPATED BENEFITS

To NASA funded missions:

Potential NASA Commercial Applications: Researchers at NASA will find the tool useful for exploration of new concepts. DAAS will allow them to experiment with different concepts of operations for interval management, fuel management, route planning, conflict avoidance and mitigation planning, and separation standards. NASA could couple the tool with advanced NAS-wide simulations platforms like SMART NAS to evaluate other technologies in presence of automated separation assurance. The researchers could use this tool to investigate minimum aircraft performance requirements to ensure safe operations. Finally, a network of DAAS based tools

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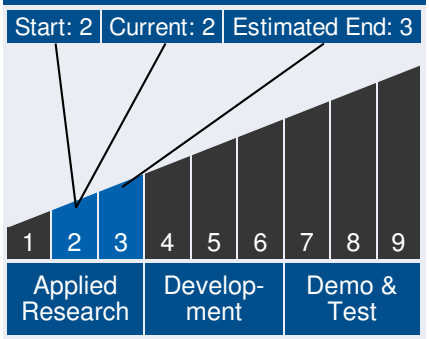
Technology Maturity



Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

Program Manager:

- Carlos Torrez

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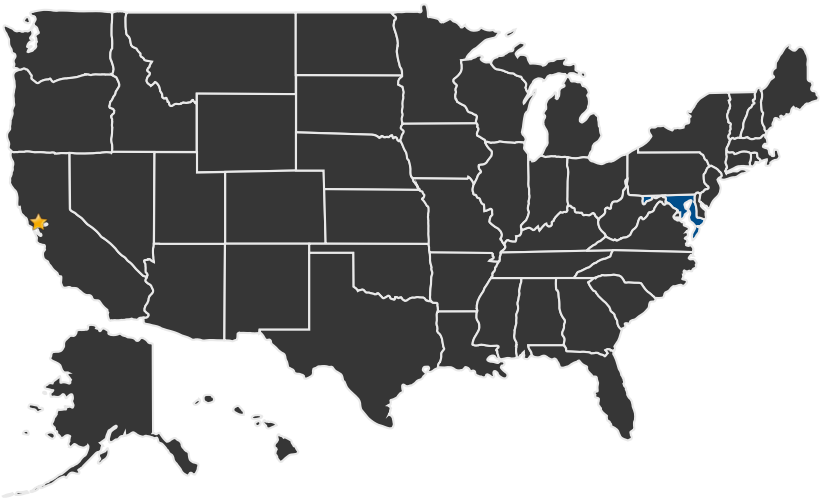
could provide the basis for investigating the risks in complete automation of safety.

To the commercial space industry:

Potential Non-NASA Commercial Applications: DAAS can be used by airlines to plan the best routes in presence of congestion by using it to answer what-if scenarios. They could also use DAAS tools to plan contingency maneuvers in presence severe weather.

U.S. WORK LOCATIONS AND KEY PARTNERS



U.S. States With Work

Lead Center:
Ames Research Center

Other Organizations Performing Work:

- Intelligent Automation, Inc. (Rockville, MD)

PROJECT LIBRARY

Presentations

- Briefing Chart
  - (http://techport.nasa.gov:80/file/23439)

Management Team *(cont.)*

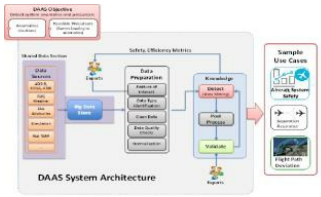
Principal Investigator:

- Ankit Tyagi

Technology Areas

Primary Technology Area:
Communications, Navigation, and Orbital Debris Tracking and Characterization Systems (TA 5)

IMAGE GALLERY



DAAS: Data Analytics for Assurance of Safety, Phase I

DETAILS FOR TECHNOLOGY 1

Technology Title

DAAS: Data Analytics for Assurance of Safety, Phase I

Potential Applications

Researchers at NASA will find the tool useful for exploration of new concepts. DAAS will allow them to experiment with different concepts of operations for interval management, fuel management, route planning, conflict avoidance and mitigation planning, and separation standards. NASA could couple the tool with advanced NAS-wide simulations platforms like SMART NAS to evaluate other technologies in presence of automated separation assurance. The researchers could use this tool to investigate minimum aircraft performance requirements to ensure safe operations. Finally, a network of DAAS based tools could provide the basis for investigating the risks in complete automation of safety.