

Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction, Phase II Project

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



ABSTRACT

The goal of this research is to create a suite of tools for monitoring airport gate activities with the objective of improving aircraft turnaround prediction. Airport ramp areas are the most crowded and cluttered spaces in the entire National Airspace System (NAS). Operations associated with turnaround of the aircraft from the gate represent a significant source of delay and therefore impact the predictability of NAS operations. The computer-vision-based Gate Activity Monitoring TOol Suite (GAMTOS) will specifically identify the various stages of turnaround such as refueling, baggage handling, and deicing. It will further employ a probabilistic model of the times associated with each of these events, that will be used for predicting the future sequence of events and their predicted times of completion. We seek to leverage our expertise in monitoring aircraft using the Vision BAsed Surveillance System (VBASS) currently being developed under a Phase III SBIR research from NASA Ames Research Center. At the end of Phase II, the GAMTOS software is expected to operate in two different modes. The first mode is an offline mode, which generates a database of gate activities, their timings, and their sequence. The second mode is a real-time mode which involves continuous monitoring of activities and prediction of future activities.

ANTICIPATED BENEFITS

To NASA funded missions:

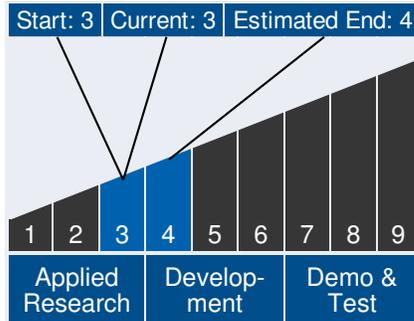
Potential NASA Commercial Applications: By providing improved pushback time Prediction, GAMTOS directly benefits Spot and Runway Departure Advisor (SARDA), which is part of the Advanced Technology Demonstration (ATD) II. GAMTOS is also directly applicable to objectives of the Networked ATM sub-project under the Shadow Mode Assessment Using Realistic Technologies in the National Airspace System (SMART NAS) project. GAMTOS is expected to increase the gate operations



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Technology Maturity



Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

Program Manager:

- Carlos Torrez

Continued on following page.

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predictability and reduce the total cost of National Airspace System operations. GAMTOS would further enhance the development of Trajectory-Based Operations (TBO) concepts and enabling technology solutions that enable capacity, throughput, and efficiency gains within the various phases of gate-to-gate operations.

To the commercial space industry:

Potential Non-NASA Commercial Applications: Low-cost airport activity monitoring techniques are of considerable interest to FAA and airports in general. It can be used by airlines to monitor the efficiency and bottlenecks in their own operations. GAMTOS directly benefit the American Airlines who is working on expected off-block time prediction. Potentially GAMTOS technology can be inserted into the existing ramp-area situational awareness product such as Aerobahn. Moreover, computer-vision-based activity monitoring techniques are of significant interest in several areas such as warehouses, commercial office buildings, train stations, and bus stations.

Management Team (cont.)

Principal Investigator:

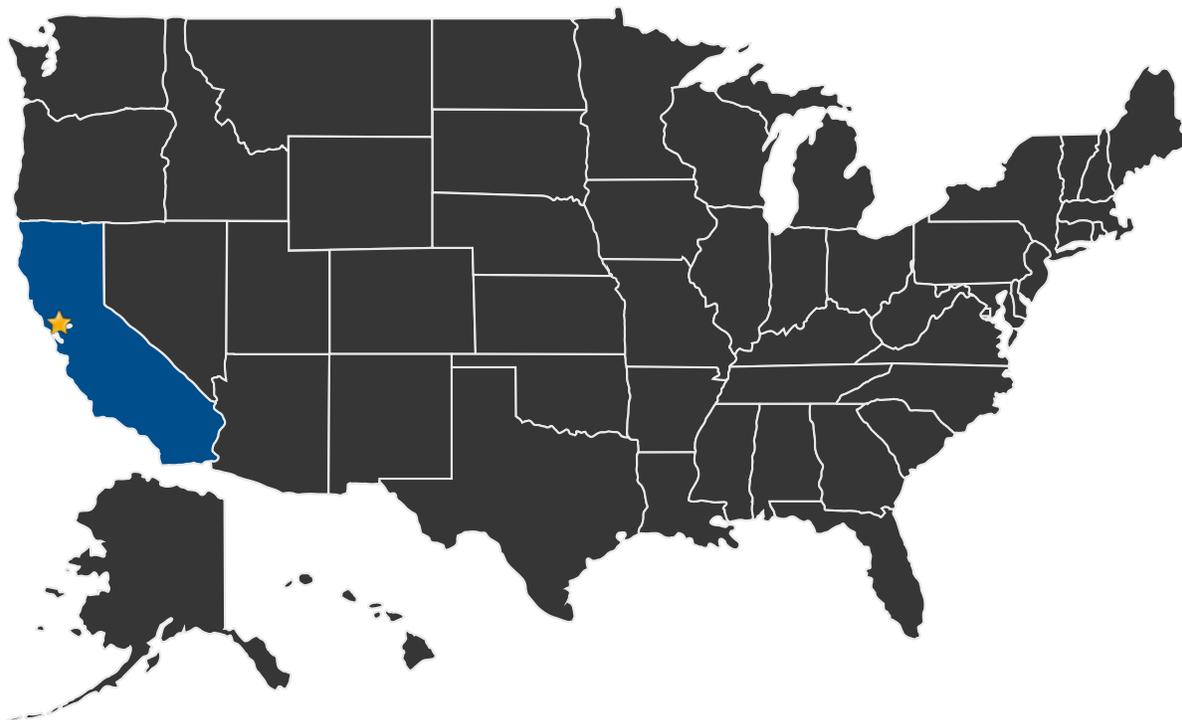
- Hui-ling Lu

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U.S. WORK LOCATIONS AND KEY PARTNERS



- U.S. States With Work
- ★ Lead Center:
Ames Research Center

Other Organizations Performing Work:

- Optimal Synthesis, Inc. (Los Altos, CA)

PROJECT LIBRARY

Presentations

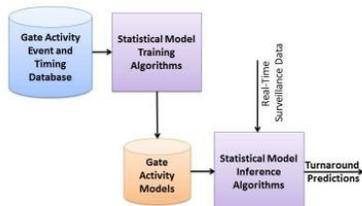
- Briefing Chart
 - (<http://techport.nasa.gov:80/file/23325>)

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IMAGE GALLERY



Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction, Phase II

DETAILS FOR TECHNOLOGY 1

Technology Title

Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction, Phase II

Potential Applications

By providing improved pushback time Prediction, GAMTOS directly benefits Spot and Runway Departure Advisor (SARDA), which is part of the Advanced Technology Demonstration (ATD) II. GAMTOS is also directly applicable to objectives of the Networked ATM sub-project under the Shadow Mode Assessment Using Realistic Technologies in the National Airspace System (SMART NAS) project. GAMTOS is expected to increase the gate operations predictability and reduce the total cost of National Airspace System operations. GAMTOS would further enhance the development of Trajectory-Based Operations (TBO) concepts and enabling technology solutions that enable capacity, throughput, and efficiency gains within the various phases of gate-to-gate operations.