

Aeronautics

FACET: Future Air Traffic Management Concepts Evaluation Tool

Comprehensive software eases air traffic management

The NASA Ames Research Center offers the opportunity to license FACET, a flexible software tool for air traffic management. With thousands of planes flying overhead in the U.S. at any given time, there is an urgent need for tools that help avoid air traffic incidents and delays. To help air traffic control centers improve airline safety and efficiency, NASA developed FACET, a system software for performing powerful computational simulations for evaluating advanced concepts of air-traffic management. It includes a program that generates a graphical user interface plus programs and databases that implement computational models of weather, airspace, airports, navigation aids, aircraft performance, and aircraft trajectories.

BENEFITS

- Effectively decreases airline accidents via routing
- Highly efficient: FACET can swiftly generate as many as 15,000 aircraft trajectories on a single desktop or laptop computer
- Easy to use: FACET provides trajectories and traffic flow data presented in a 3-D graphical user interface

technology solution



THE TECHNOLOGY

Actual air traffic data and weather information are utilized to evaluate an aircraft's flight-plan route and predict its trajectories for the climb, cruise, and descent phases. The dynamics for heading (the direction the aircraft nose is pointing) and airspeed are also modeled by the FACET software, while performance parameters, such as climb/descent rates and speeds and cruise speeds, can also be obtained from data tables. The resulting trajectories and traffic flow data are presented in a 3-D graphical user interface. The FACET software is modular and is written in the Java and C programming languages. Notable FACET applications include reroute conformance monitoring algorithms that have been implemented in one of the Federal Aviation Administration's nationally deployed, real-time operational systems.

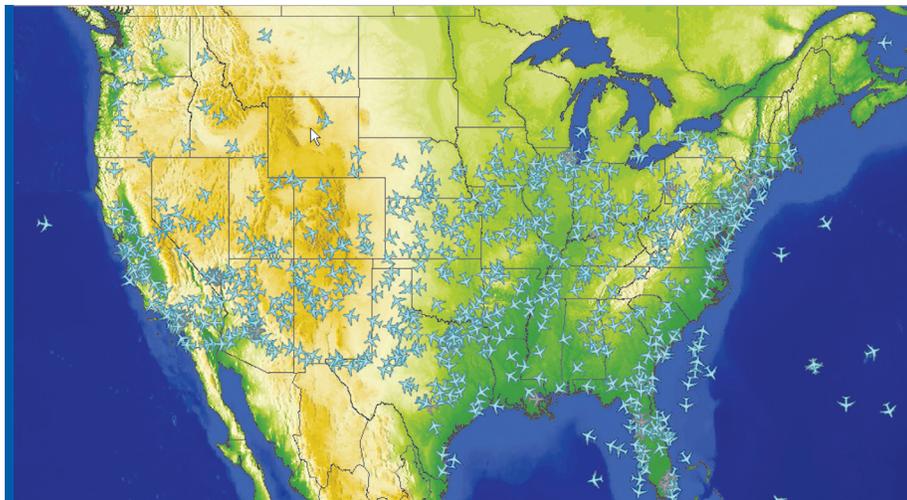


FIGURE – FACET Graphical User Interface used to display the selected airspace boundaries, aircraft locations, flight plans, track histories, and aircraft Flight Data Blocks.

APPLICATIONS

The technology has several potential applications:

- Air traffic management
- Development of enhanced flight routing strategies for saving fuel, preserving airline schedules and reducing passenger delays and missed connections

PUBLICATIONS

U.S. Patent 7,702,427 and 8,290,696

ARC-14653 -1 and ARC-14653-2

For more information go to:

<http://www.aviationsystemsdivision.arc.nasa.gov/research/modeling/facet.shtml>

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