VACCINE
Visual Analytics for Command, Control, and Interoperability Environments
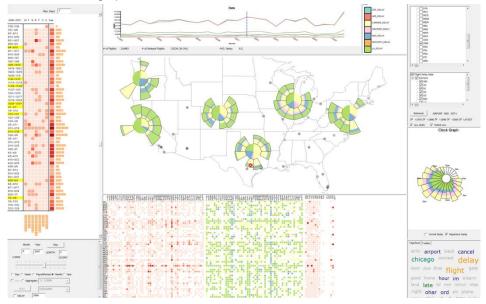### A U.S. Department of Homeland Security Center of Excellence

Flight Delay Data Exploration System for Analyzing Spatiotemporal Multivariate Data

Benefit: Our system provides users from government agencies (e.g., TSA, FAA) to the general public with a suite of tools that enables the spatiotemporal exploration of multivariate flight delay records. This suite of tools also enables the analysis of flight delay patterns and trends as well as provides forecasts of delays based on a given time and location using historical data.

Mission Need

Complex data with combinations of these characteristics: temporal, spatial, network-based, and multi-variate makes analysis more difficult. Example data sets showing such complexity include data from transportation, shipping, and logistics industries that have many connected operational places (e.g., origin and destination pairs) with multiple variables describing the operations in the places based on time, transactions, or incidents. In this work, we focus a visual analytics system that enables effective analysis through a suite of linked views that include networked geographical map, pixel-oriented network matrices, calendar, and clock views. In addition, we have designed new visual representations, Petal and Threads, to provide features of multiple variables among operational locations with minimized visual clutter.

Data Layers:
- *Flight delay records*
- *TSA records*
- *Airports*

Collaborators:
- *TSA*

Our system consists of multiple coordinated and linked views: Calendar view, Filters for selecting times (for aggregation), airports, airlines, and ages of airplanes, Line graph and correlation view, Legend view for displaying types of delays, Geographical view, Pixel view, Clock view, Twitter tag cloud view.

Funded by:
U.S. Department of Homeland Security Center of Excellence

Early Development   Lab Prototype   Commercial Product