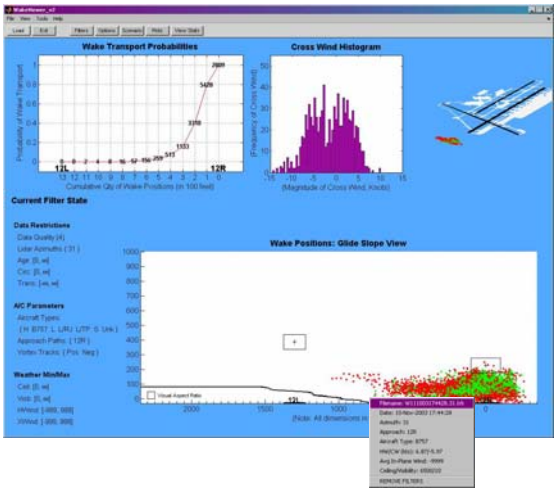
WakeViewer Data Visualization Tool

The WakeViewer Data Visualization Tool, developed at The MITRE Corporation's Center for Advanced Aviation System Development in collaboration with The Volpe National Transportation Systems Center, is a data analysis and scenario presentation software application that plots and visually queries wake turbulence data collected by the Federal Aviation Administration. By combining several plots of measured pulsed lidar data with associated weather and operating environment data, it enables a multidimensional illustration of these factors and a better understanding of wake turbulence behavior. This tool assists the user in developing and responding to research questions in identifying and analyzing outlier data.

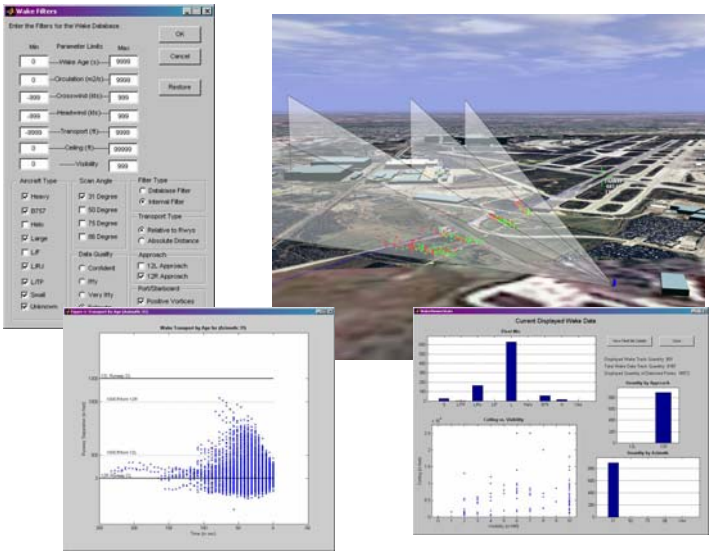


As a data analysis tool: This software has the ability to filter the data, rich with geometric, aircraft and operating environment parameters, as well as an innovative ability to visually filter based on geometric selection. In its main interface, WakeViewer displays:

- Positional scatter plots detailing lateral transport bounds, glide slope locations, and ground clutter profiles
- Detailed data statistics with respect to selected filters (e.g. total wakes, fleet mix, associated weather, etc.)
- Wake tracks within an isometric runway view for geometric context
- Lateral transport histogram with associated probabilities
- Crosswind histogram

WakeViewer provides the researcher with further information on wake behavior via additional plots (such as transport distances by age or crosswind, scroll-through time series plots, and current vs. proposed separation standard comparison plots) as well as the rigorous ability to filter data based on data attributes:

- Lateral transport minima/maxima
- Wake age and measured circulation
- Lidar scan azimuth
- Aircraft weight class and approach path
- Measurement quality attributes



As a communication tool: WakeViewer exports a data file, which combines the filtering ability with the power of the PAVE (Portable Aviation Visualization Environment) virtual reality setting. This allows the viewer to observe single or multiple wake tracks from innumerable perspectives such as from the cockpit of a trailing aircraft or from a stationary position.

The WakeViewer application, designed in MATLAB®, is completely stand-alone with the installation of the MATLAB® Component Runtime Software. The input data format requires a specific database format, but is flexible to accept varying dimensions of data content.

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