

Categorizing Flight Paths using Data Visualization and Clustering Methodologies

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Abstract— This work leverages the U.S. Federal Aviation Administration’s Traffic Flow Management System dataset and DV8, a recently developed tool for highly interactive visualization of air traffic data, to develop clustering algorithms for categorizing air traffic by their varying flight paths. Two clustering methodologies, a spatial-based geographic distance model, and a vector-based cosine similarity model, are demonstrated and compared for their clustering effectiveness. Examples of their applications reveal successful, realistic clustering based on automated clustering result determination and human-in-the-loop processes, with geographic distance algorithms performing better for enroute portions of flight paths and cosine similarity algorithms performing better for near-terminal operations, such as arrival paths. A point extraction technique is applied to improve computation efficiency.