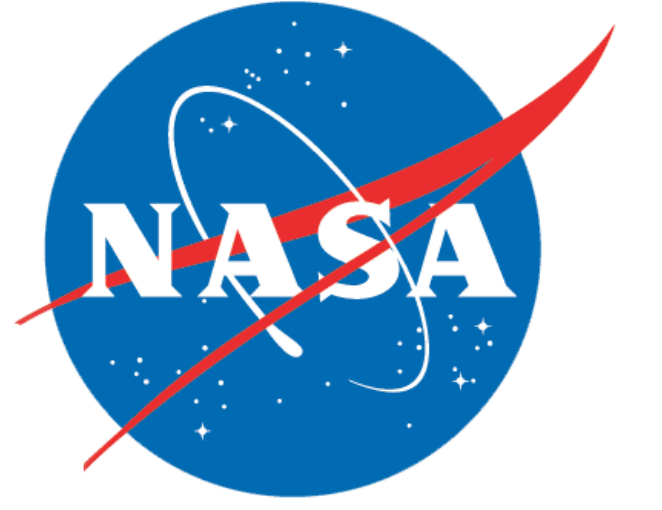




Auna: A Configuration Driven Geospatial System for Multimodal Mobility

Kiana Partovi

University of Nevada Reno

Vedant Malhotra

University of Nevada Reno

Carlos Paradis

KBR @ NASA Ames Research Center

Misty Davies

NASA Ames Research Center

Maps and Statistics

Auna integrates geospatial datasets from multiple sources. The **maps & statistics** pipeline processes maps, polygons (e.g. regional statistics), lines (e.g. air traffics), and points (e.g. vertiports) and displays them as layers.

Auna

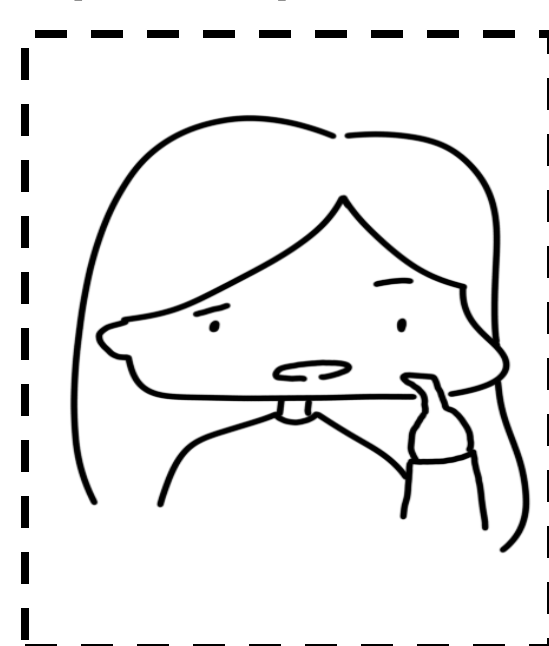
Auna is a configuration-driven interface where geospatial data sources are displayed as layers or stories. The configuration file defines the path to the required data sources, layers, and stories to be displayed on runtime. Together, Auna can be tailored to specific project needs.

Layers

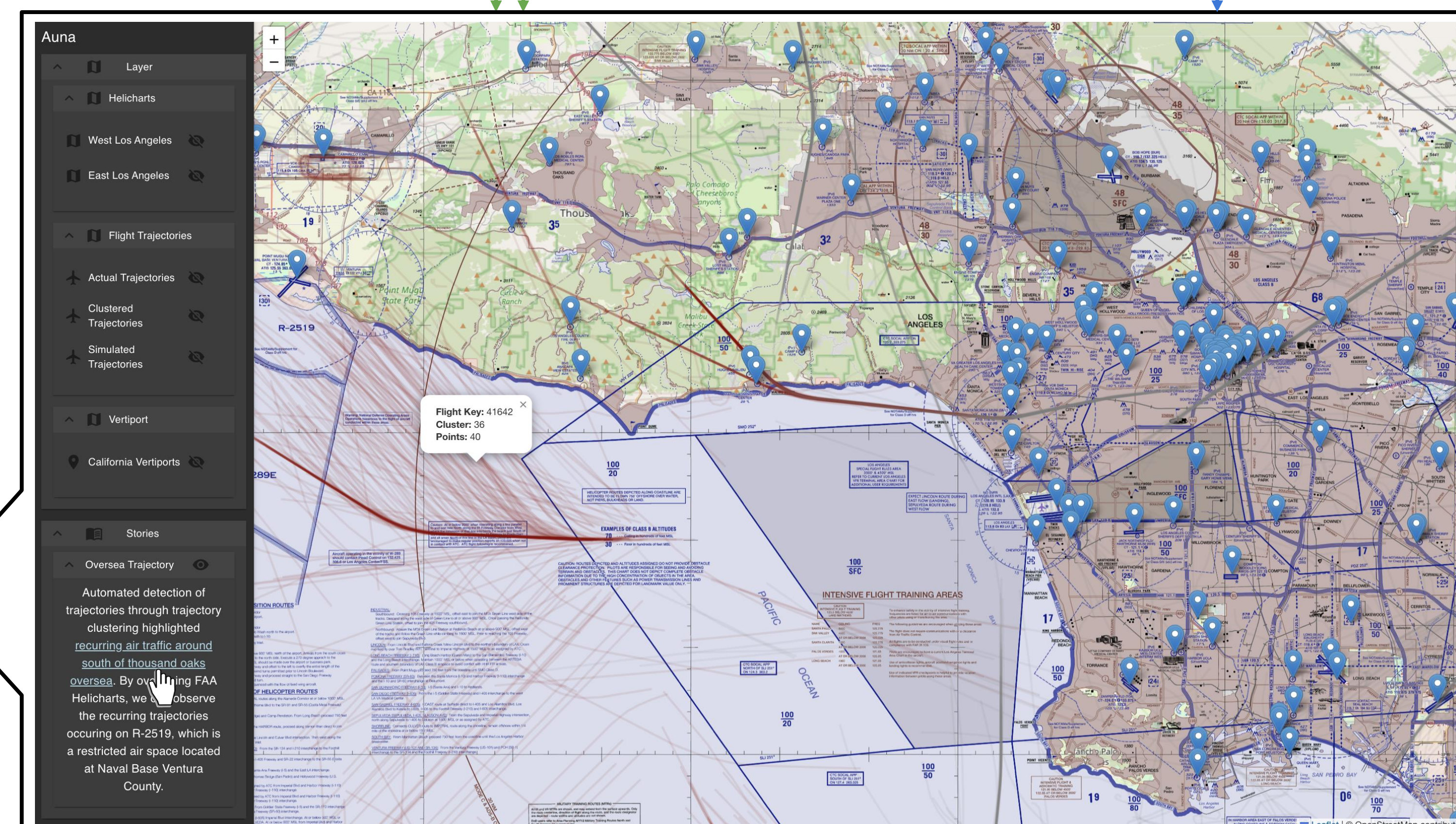
Each geospatial dataset is represented as a "Standardized Frontend GeoJSON". Layers can be toggled on and off for data exploration.

Stories

Stories are pre-defined sets of layers that can jointly be toggled on and off. They are accompanied by a text description and set of keywords that highlight a map region to explain patterns.

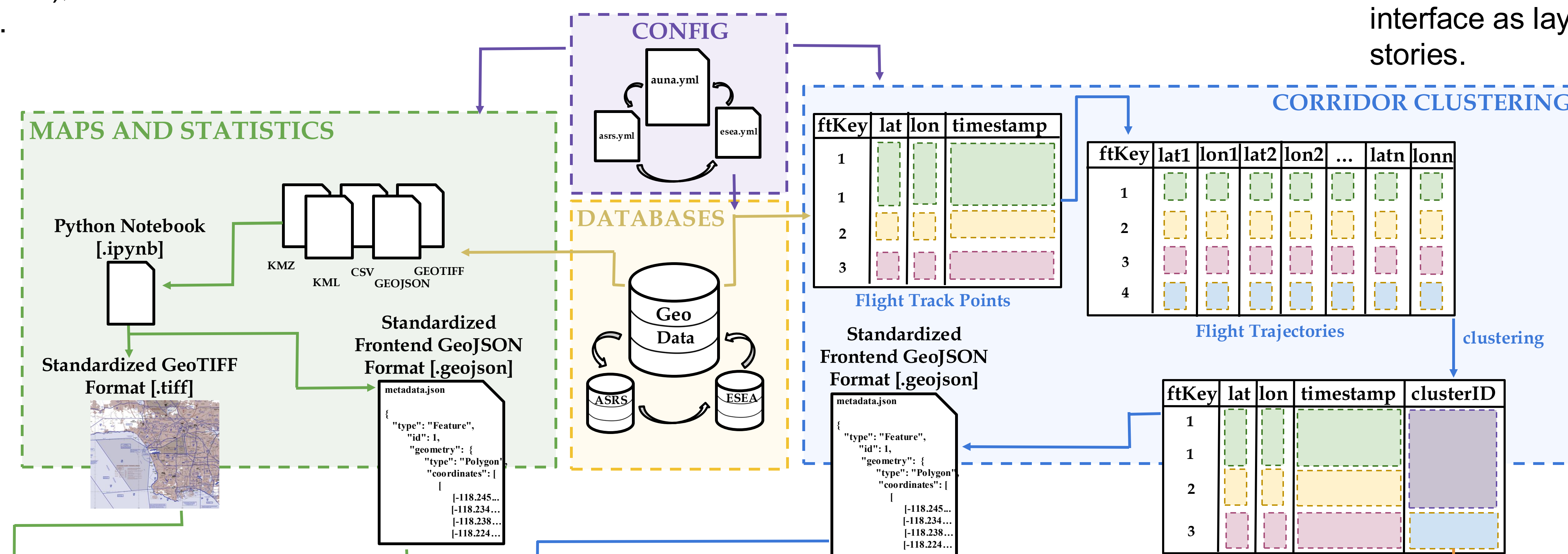


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Config and Databases

Configuration files are used to customize **database** data as layers. Each data pipeline is documented as Python Notebooks and scripts. The data pipelines output a standardized data format for Auna frontend.



Corridor Clustering

Auna can identify recurring flight paths over time (candidate corridors) using **trajectory clustering**. These clusters can then be display on Auna's interface as layers for exploring or explaining as stories.

Corridor Simulation

Once corridors are identified, Auna can export these corridors as an air traffic network graph for different **scenario simulations**. The air traffic network is then combined with ground traffic network and agent plans derived from census and other map data to generate realistic agent-based travel plans using UAM Simulation tools.

The simulation models agents navigating a hybrid network of air and ground traffic subject to the placement of vertiports. On each iteration, the agents (people) use different modes of transportation to find their optimal route. Each iteration can be displayed in Auna as a layer to visualize the optimal configuration for vertiports.

References

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Acknowledgements

