



A Simplified Framework for Air Route Clustering Based on ADS-B Data



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Situation

- ▶ The volume of flight traffic gets increasing over the time, which makes the strategic traffic flow management become one of the challenging problems since it requires a lot of computational resources to model entire traffic data.
- ▶ ADS-B is intended to transform air traffic control by providing more accurate and reliable tracking of airplanes in flight and on the ground. In the plan to transform ATC from radar-based to satellite-based system [1]

Problems

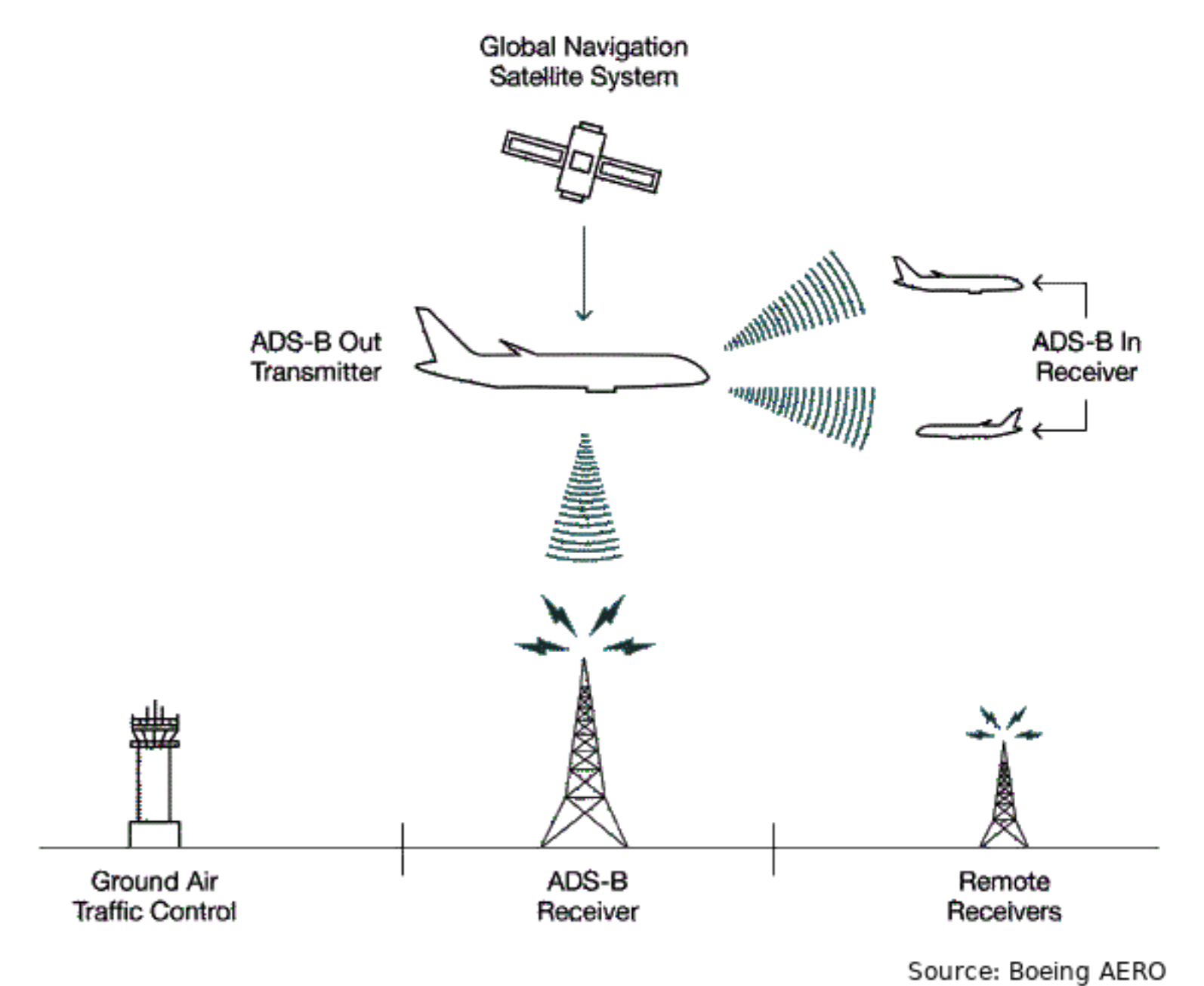
- ▶ The limited studies on clustering algorithm support for spatial-temporal ADS-B data
- ▶ Challenging on automatically estimate algorithm's parameters for discovering patterns of spaced data points

Settings

- ▶ For comparison: Re-implement the benchmark method from Adria [2] in the case of ADS-B trajectory data, which are crawled from *FlightAware*
- ▶ The used methodologies in this works

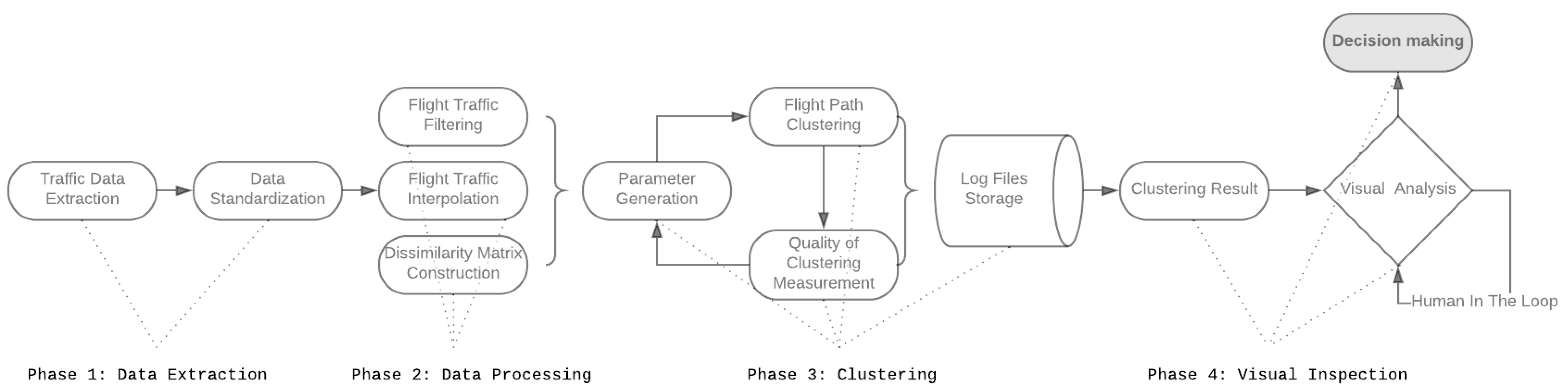
Trajectory data	ADS-B
Distance between curves	Fréchet distance
Clustering	DBSCAN
Decide No. Cluster	Silhouette and DB

How ADS-B works



Solution

Propose & implement a data mining framework for identifying the air route structure, and adapting for ADS-B data



Experimental Results

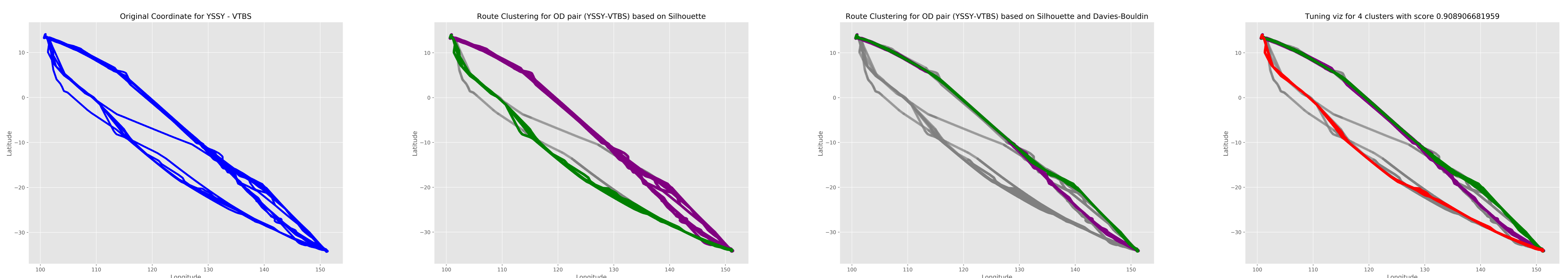


Figure: The result from our framework for the detected clusters from different scenarios, in case of Sydney-Suvarnabhumi airports

References

- ▶ K. Richards C. Dean R. Miller-william and . Obrien. "New Air Traffic Surveillance Technology. Avionics and Air Traffic Management". In: 2010.
- ▶ Adria Segarra Torne. "Route Clustering for Strategic Planning in Air Traffic Management". MA thesis. University of California, Irvine, 2015.

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