



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

Quan Duong

Tenpoint7 Research and John von Neumann Institute  
quan@tenpoint7.com

## 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]

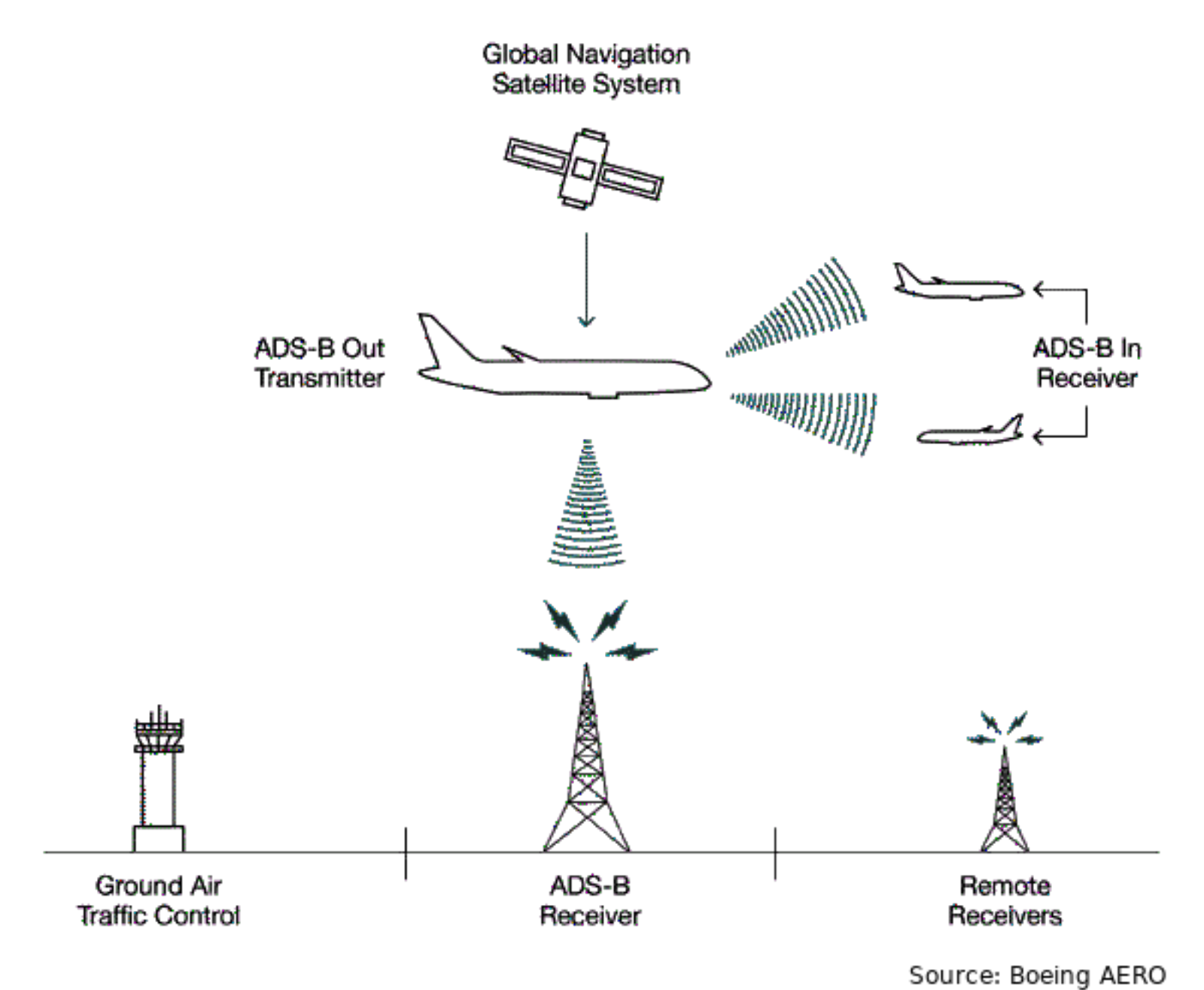
## Problems

- ▶ 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

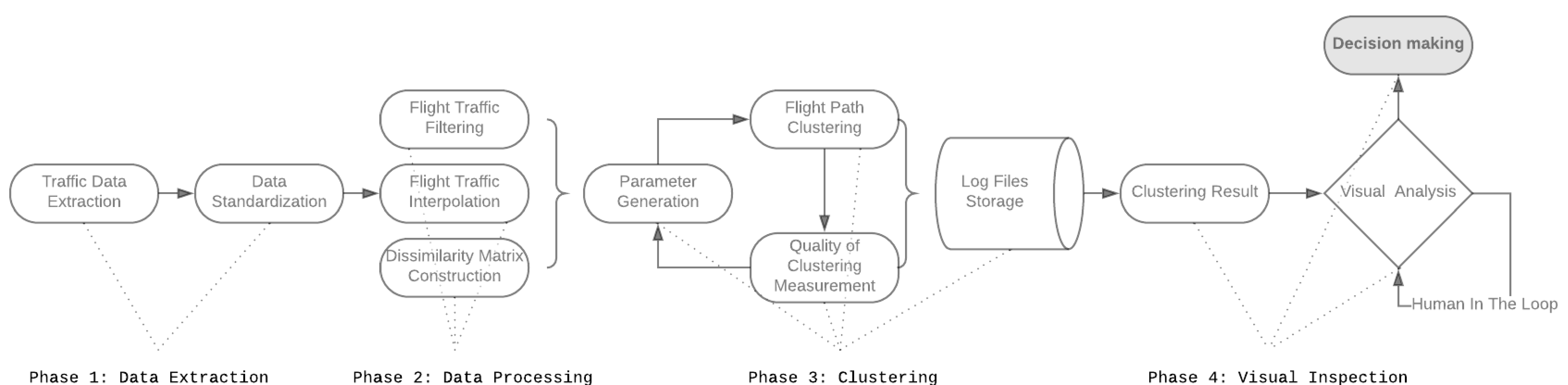
- ▶ For comparison: Re-implement the benchmark method from Adria [2] in the case of ADS-B trajectory data, which are crawled from *FlightAware*
- ▶ The used methodologies in this works
  - Trajectory data                      ADS-B
  - Distance between curves        Fréchet distance
  - Clustering  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

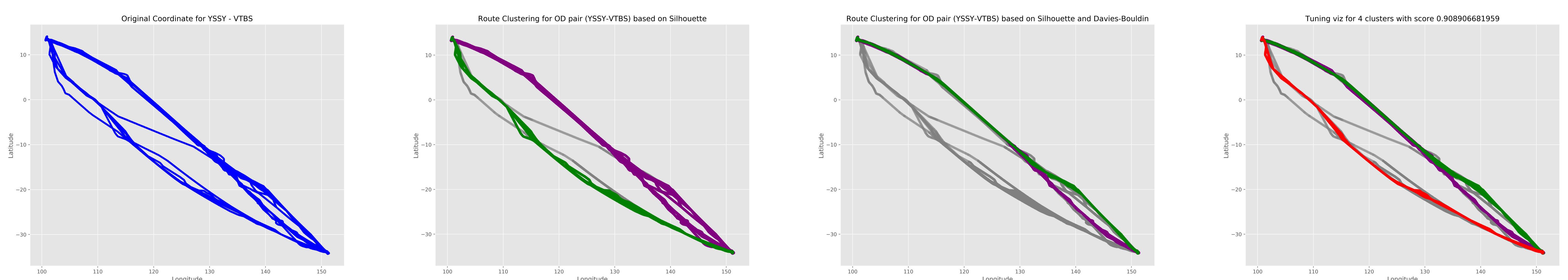


Figure: The result from our framework for the detected clusters from different scenarios, in case of Sydney-Suvarnabhumi airports

## 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". Master dissertation. Open Access Publications from the University of California: University of California, Irvine, 2015.

Get Paper

