



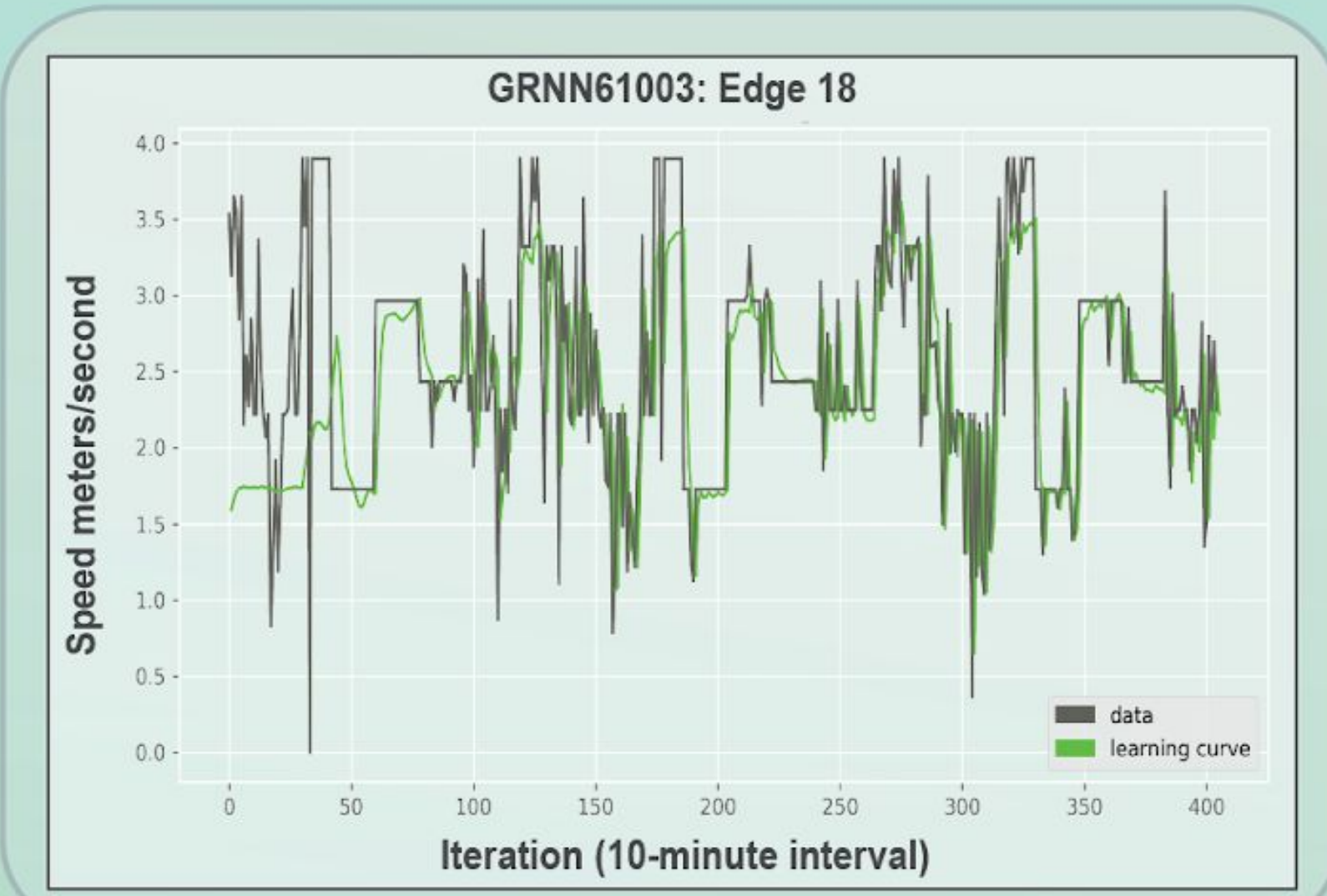
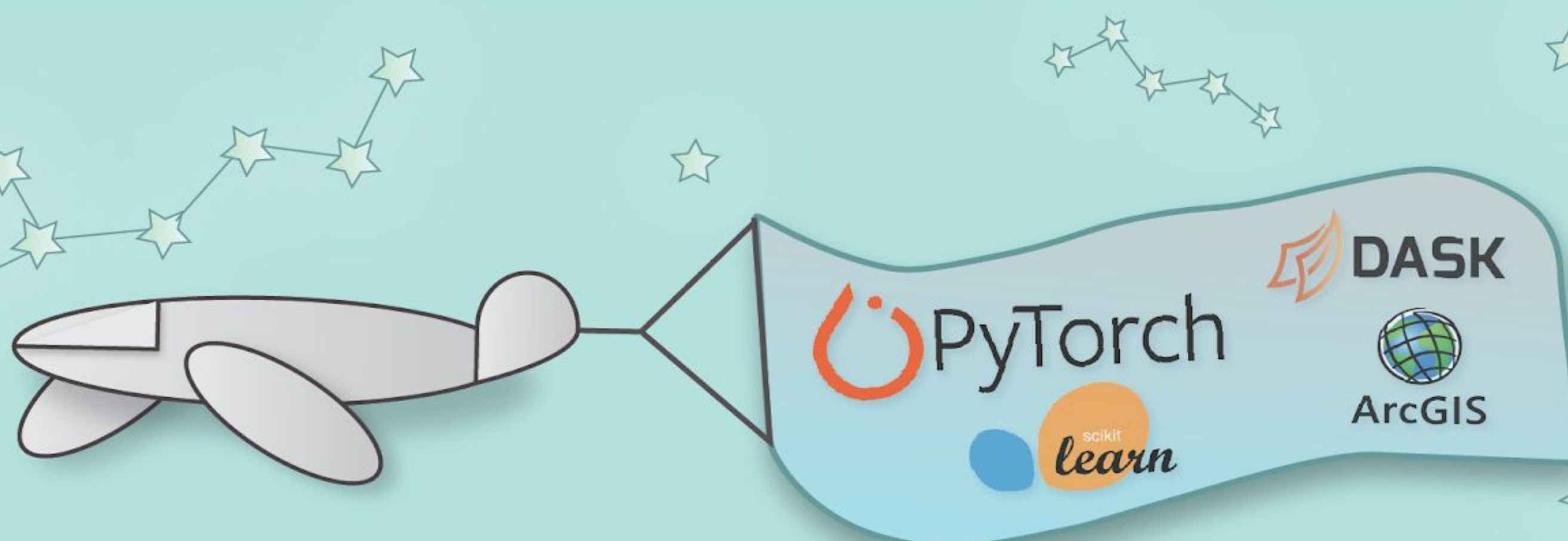
Traffic Monitoring with Machine Learning



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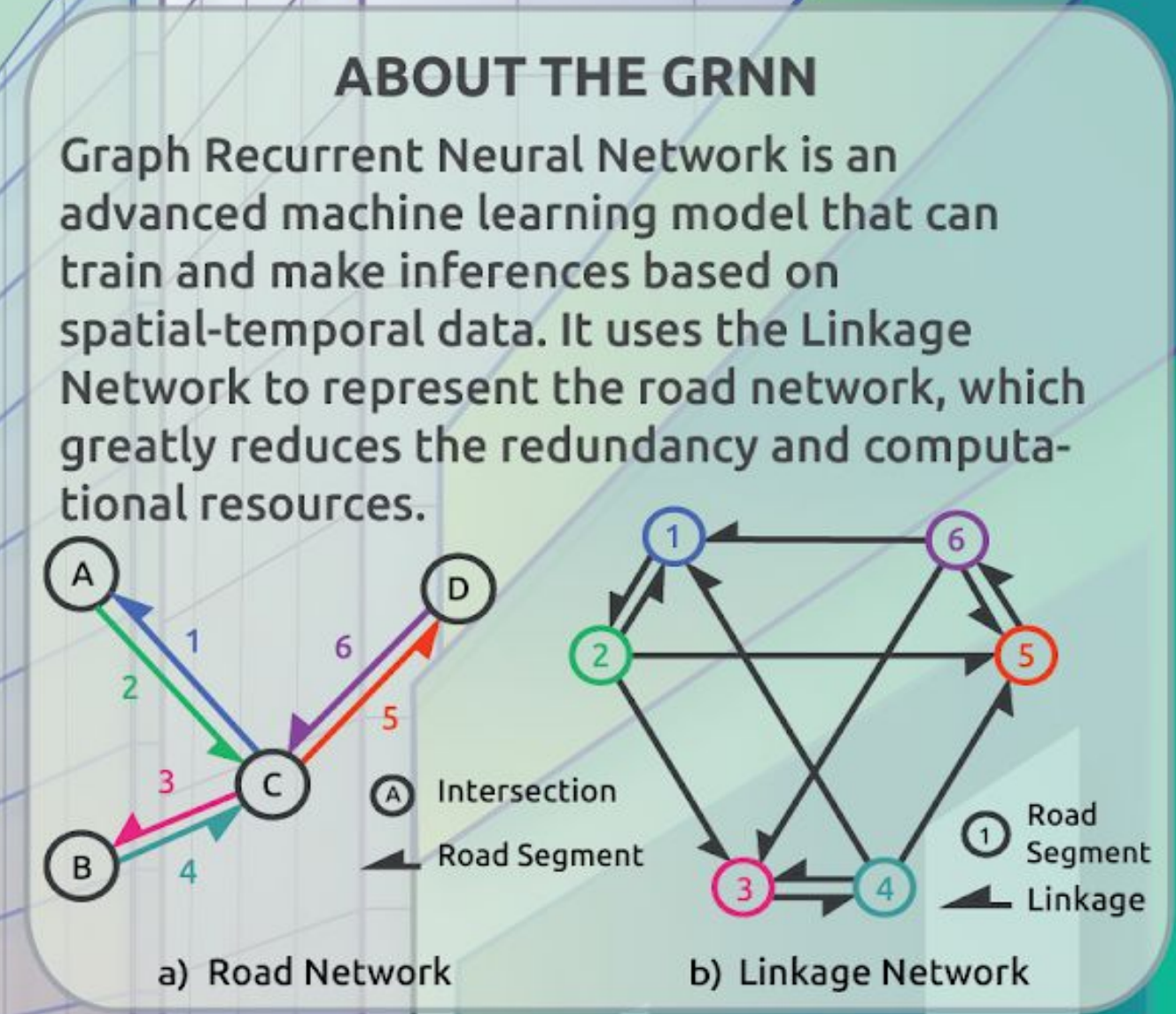
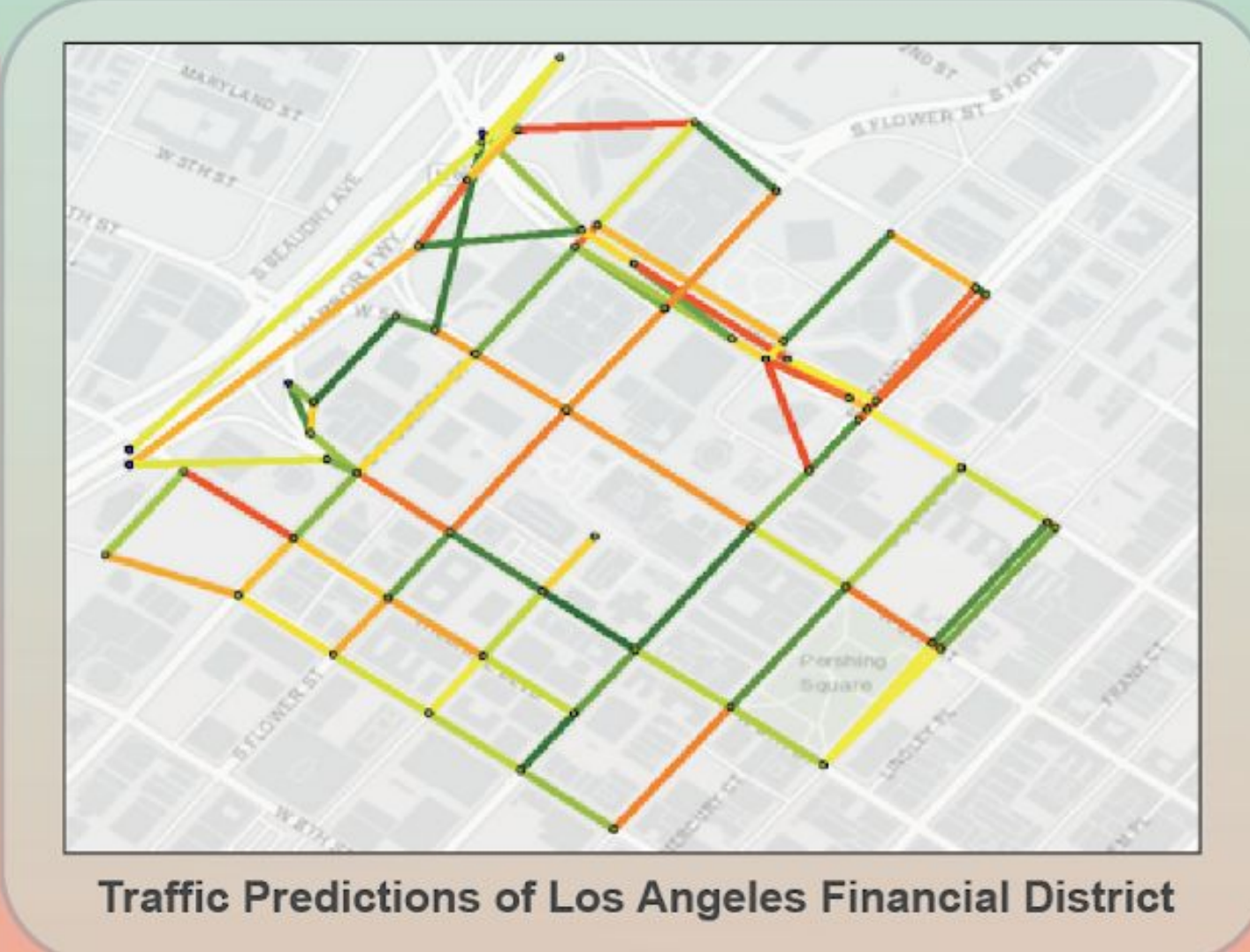


INTRODUCTION
L.A. traffic congestion causes inconveniences in the quality of life, fuel economy, and air quality. To resolve this issue, we implemented the Graph Recurrent Neural Network to monitor and predict traffic congestion based on spatial-temporal data.

OUR CHALLENGES

1. Transform traditional road network to the Linkage Network.
2. Create data preprocessing pipeline that can shape and fit the Waze data to feed into the GRNN model.
3. Implement multiple missing data imputation techniques to reasonably fill in 75% of the missing data.

We also faced big data challenges; both in data preprocessing and training the GRNN model.



CONCLUSION
In this project, we have successfully:

1. Designed and implemented a data preprocessing pipeline to create the Linkage Network for the City of Los Angeles and to reasonably impute missing data for any time series.
2. Trained and tested our GRNN model to predict the traffic speeds of the streets in the Los Angeles Financial District.
3. Verify the GRNN model and its resulting output using various visualizations.

RESULTS

The top figure is an example of the GRNN model during the training phase. It shows that the model can predict the average speeds of Edge 18 fairly accurately on a 10-minutes interval. The bottom figure shows what network looks like using the predicted speeds, where red, orange, and green correspond to heavy, medium, and free flow traffic.

