Road Traffic Prediction and Analysis

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Dataset

The US Traffic, 2015 datasets compiled by the US Department of Transportation can be found at https://www.kaggle.com/jboysen/us-traffic-2015. The primary dataset contains information on hourly volume of road traffic observed by multiple stations across all US states for the year 2015. Information on type of road and flow direction is also included. The secondary dataset contains information on stations including their location, sensor type and route.

Project idea

Predicting traffic volume at a station for a particular date-time. Visualizing hourly traffic volume at a station/route/region for different days of the week and calculating peak congestion hours for different regions.
Analysing traffic trends and discovering clusters of stations having similar traffic volume at a time, and discovering routes having high traffic congestion.

Software required

Python, pandas, NumPy, seaborn, scikit-learn, SciPy, Jupyter Lab, Google Colab, Visual Studio Code

Papers to read

1. Pan, B., Demiryurek, U. and Shahabi, C., 2012, December. Utilizing real-world transportation data for accurate traffic prediction. In 2012 IEEE 12th International Conference on Data Mining (pp. 595-604). IEEE.
2. Min, W. and Wynter, L., 2011. Real-time road traffic prediction with spatio-temporal correlations. Transportation Research Part C: Emerging Technologies, 19(4), pp.606-616.
3. Ishak, S. and Al-Deek, H., 2002. Performance evaluation of short-term time-series traffic prediction model. Journal of transportation engineering, 128(6), pp.490-498.

Work division

Each member will equally contribute in data preprocessing. Further, different group members will take up each data analysis task. Finally, everyone will collate their work.

Midterm milestone

Completing prediction of traffic volume and visualization of hourly traffic, and achieving substantial insight into traffic analysis.