

Summary

Predicting the number of services that will emerge at a given taxi stand.

Paper introduces a novel methodology for predicting the spatial distribution of taxi-passengers for a short time horizon using streaming data. (30 min horizon) First, the information was aggregated into a histogram time series. Then, three time-series forecasting techniques were combined to originate a prediction. Experimental tests were conducted using the online data that are transmitted by 441 vehicles of a fleet running in Porto.

Short- term prediction model which uses short-, mid- and long-term historical data as input.

An intelligent distribution of vehicles throughout stands will reduce the average waiting time to pick up a passenger, while the distance traveled will be more profitable.

Stand- choice problem is based on four key variables:

- 1) the expected revenue for a service over time
- 2) the distance/ cost relation with each stand
- 3) the number of taxis that are already waiting at each stand
- 4) the passenger demand for each stand over time

4 mathematical models are presented as a solution to short-term prediction problem.

Forecasting techniques that were used are Poisson model and ARIMA. {Some papers are mentioned in this paper related to mining the best passenger- finding strategies, and dividing the urban area into clusters based on historical passenger demand.}

Math, math, math...

SOLUTION WAS TESTED IN ONLINE ENVIRONMENT.

Model will be used as a feature for a recommendation system, which will produce smart live recommendations to the taxi drivers about which taxi stand they should head after a drop-off. This decision support framework will also address other features such as distance or live traffic conditions.

Predictions are correct in 76 % of cases.