

Spatio-temporal prediction of ambulance calls

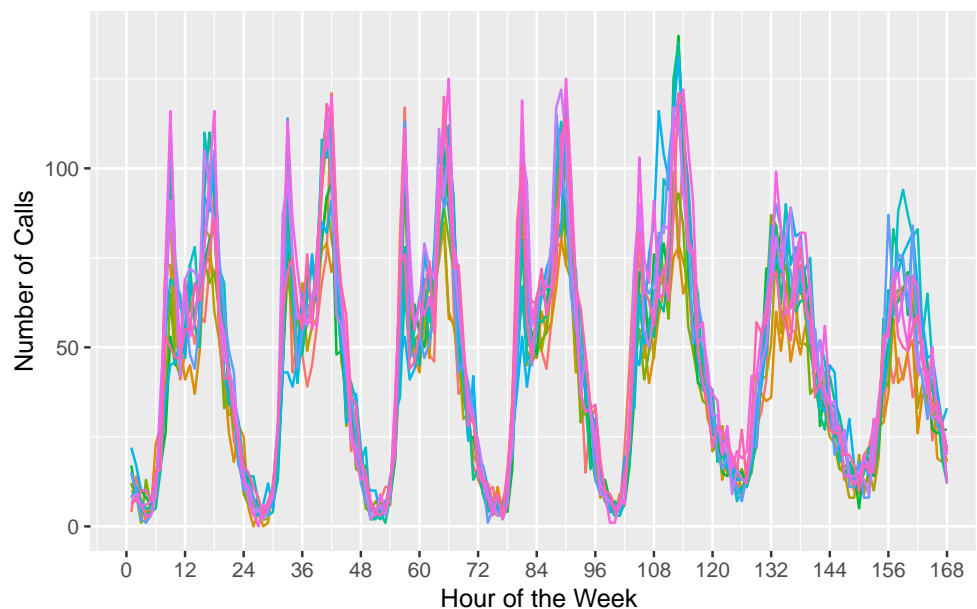
Gergana Todorova, Lancaster University

In cooperation with the North West Ambulance Service, project supervisors are Dr Anastasios Noulas from New York University and Dr Andrew Titman from Lancaster University.

Exploratory Data Analysis

- Clear weekly pattern for some types of problems

Traffic Incidents

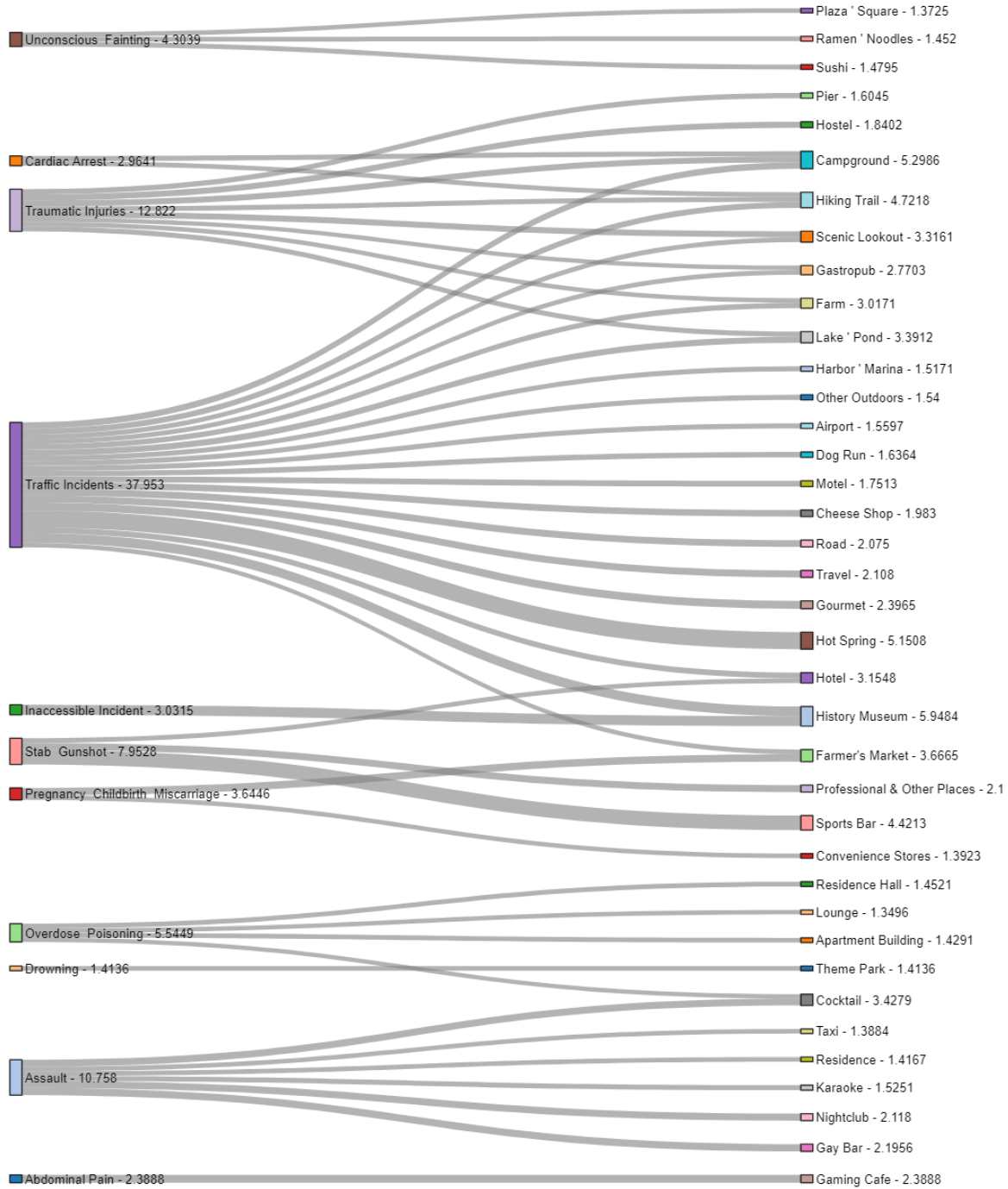


- Strong connection between human activities and ambulance calls



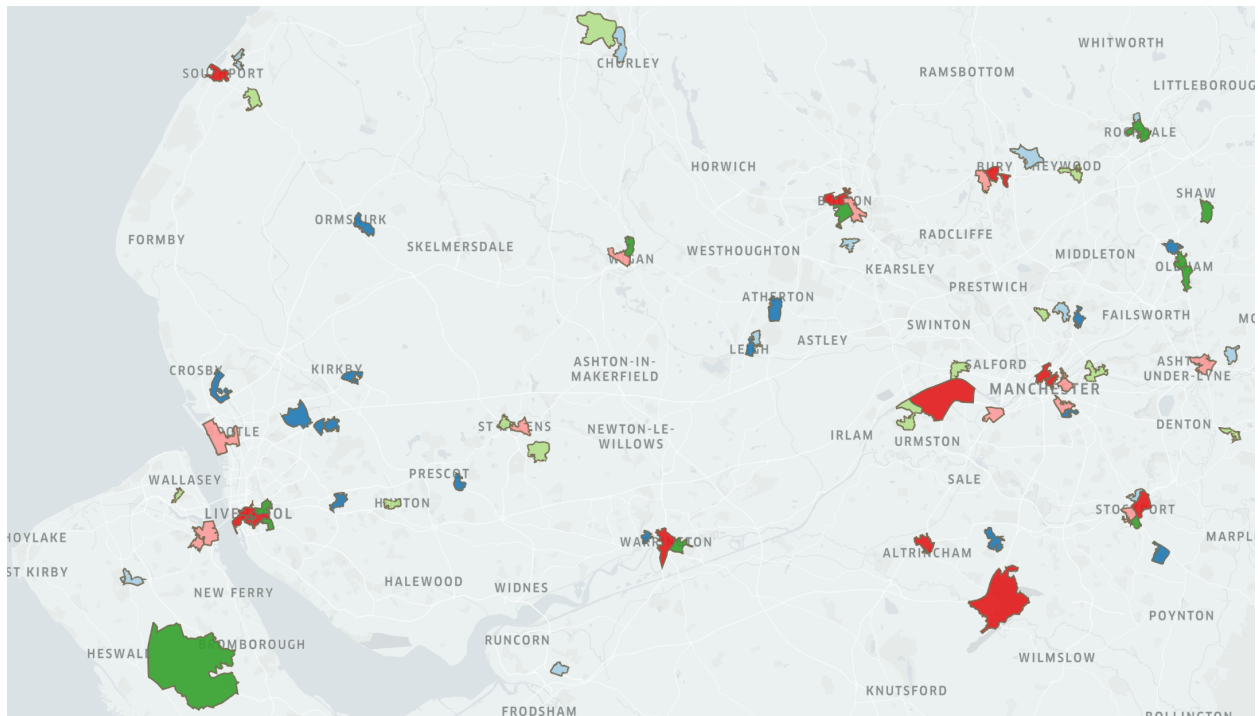
Feature Engineering

- Defined 'attractiveness' score between types of problems and human activities



- Calculated risk score for yielding an ambulance call per area

Maps shows the risk score for selected areas only. Red is indicating high risk, green - low risk, blue- not enough information.



Data Modelling

Two models were compared - ARIMA, when the data is looked purely as a time series and logistic regression, where the outcome is whether or not there will be a call in certain area at certain hour in a certain day. Logistic regression model provided 70% AUC, however, the plot below shows it is a better fit.

