

INTRODUCTION



Crime is a common social problem affecting the standard of life and economic growth of a community.

Our team is interested in analyzing crime at the University of Southern California and the city of Los Angeles using spatial and temporal factors to give recommendations and make predictions that will help agencies take actions.

DATASETS

Los Angeles Crime
Years: 2010 – 2018
1.86M data points
26 attributes

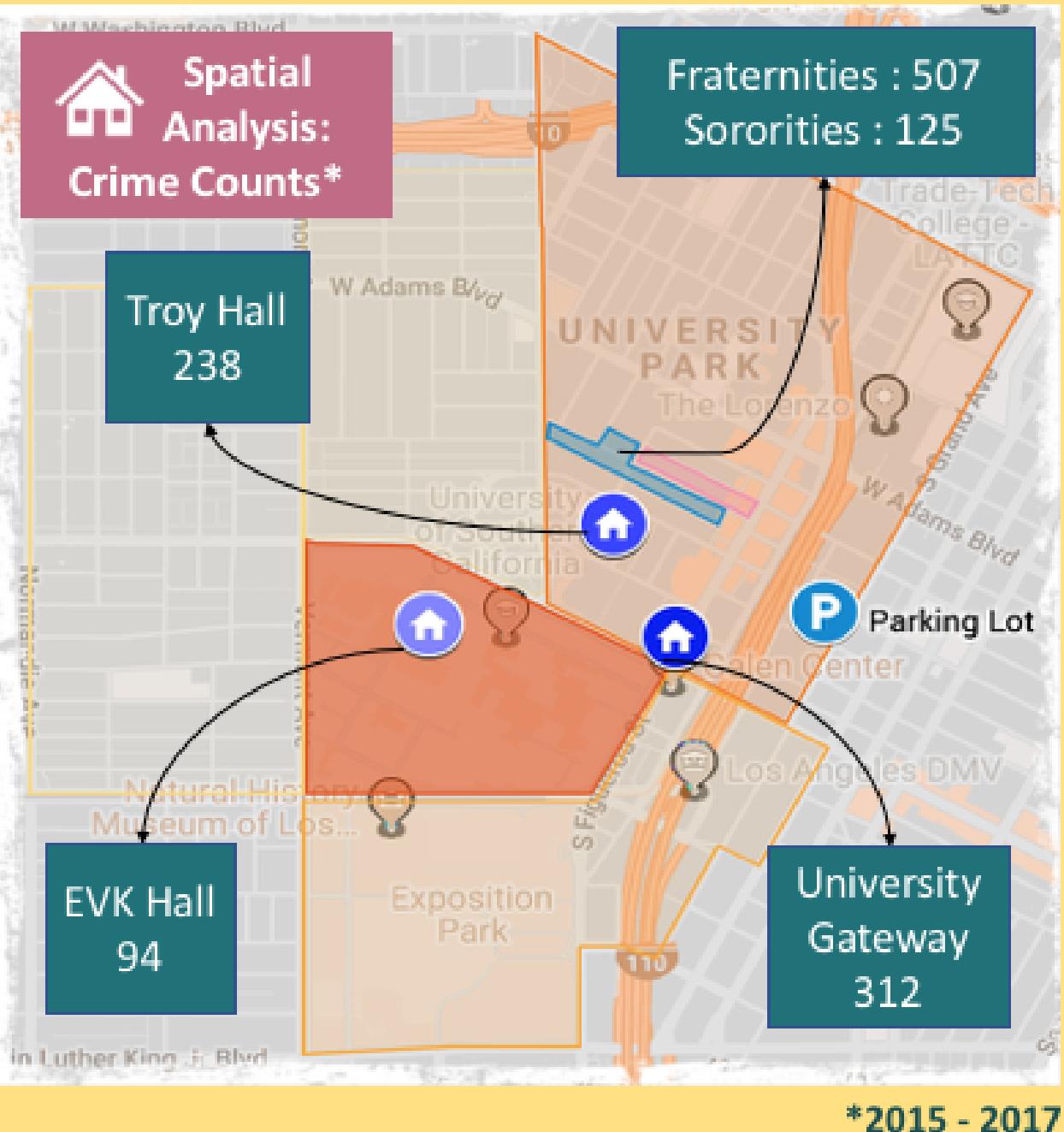
USC DPS Crime
Years: 2012 – 2017
22.26K data points
23 attributes

Los Angeles Neighborhood*
Years: 2010 -2016
Information for 272 LA neighborhoods

*Socio-economic factors : Demography, Education, Employment & Income, Transportation, Housing and Poverty.

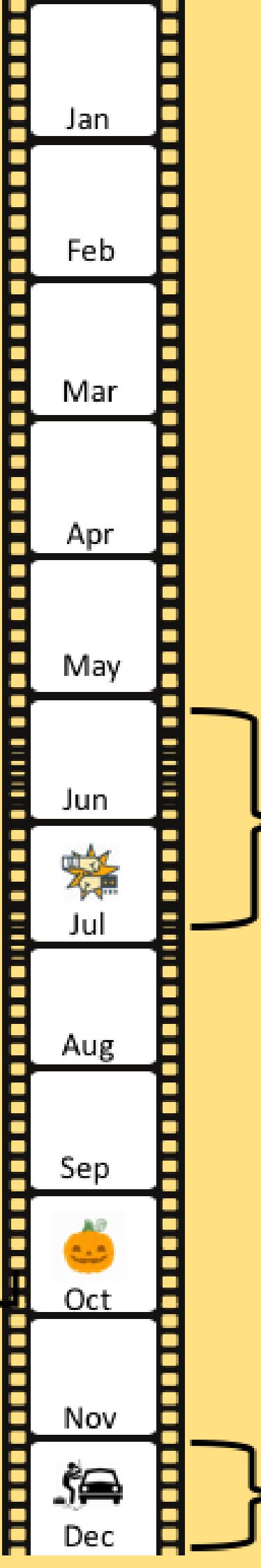
USC ANALYSIS

Area wise Crime Density and Crime Hotspots

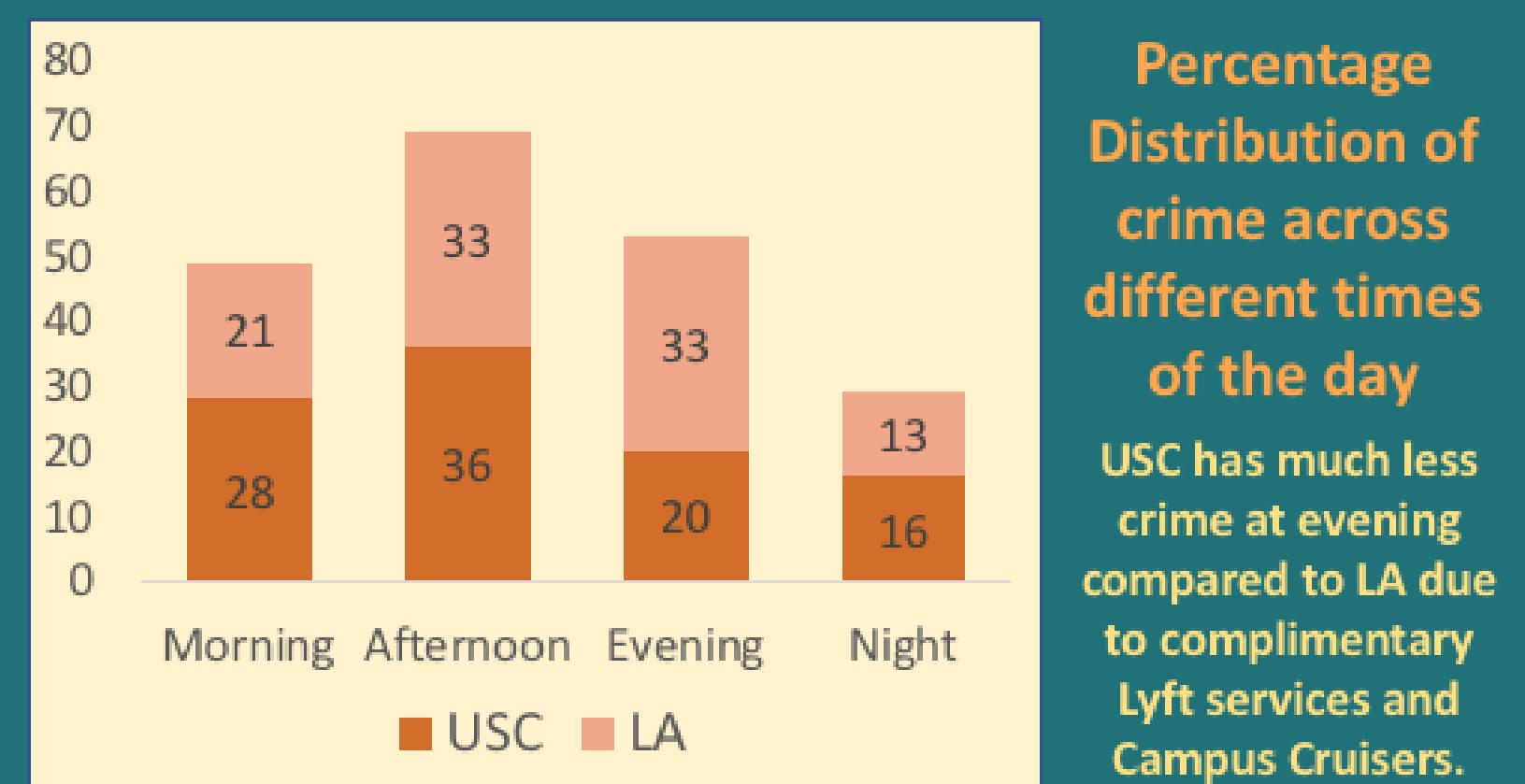


Halloween Week at USC
Maximum crimes compared to any other week in the year - 140

Statistics (2017)	SC	UCLA
Crime Count	4000	1000
Enrollment	45,000	44,000
Social Media Activity	USC DPS More Active	UCLA PD Less Active



Assault, Battery and Harassment peaks in LA



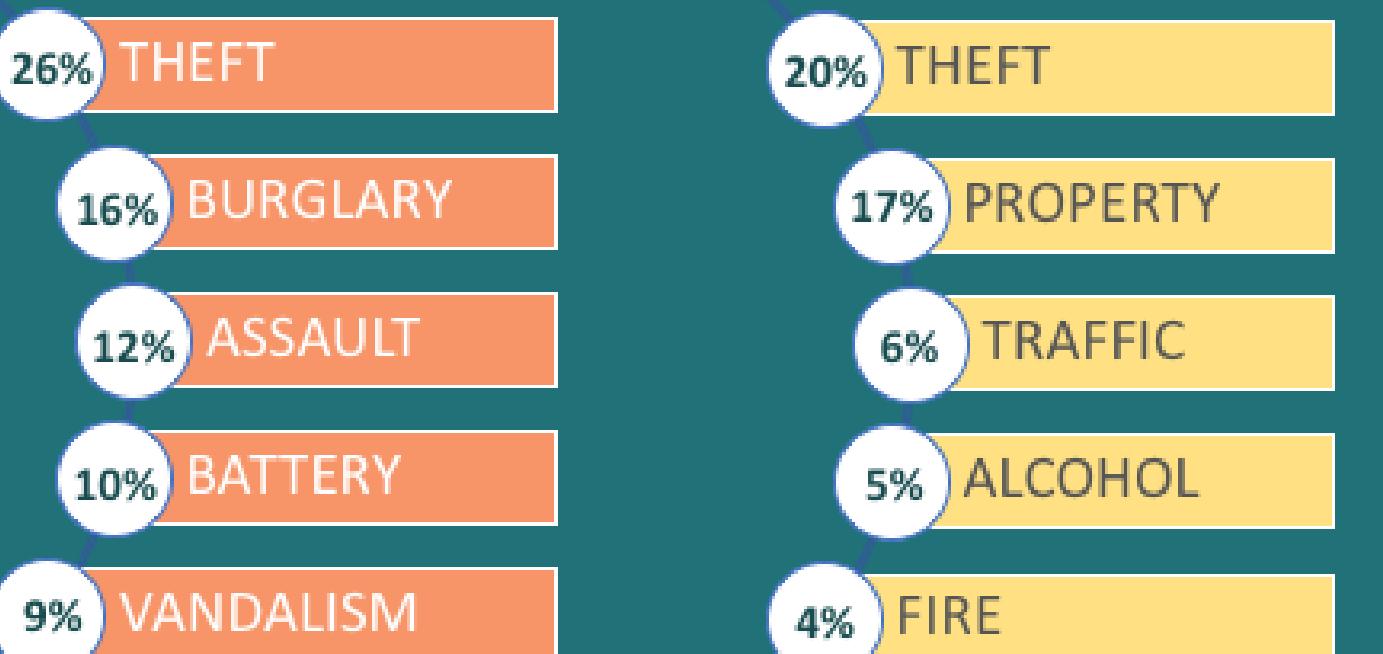
Theft, Burglary and Vehicle Theft peaks in LA

FIGHT ON CRIME



LOS ANGELES ANALYSIS

TOP 5 CRIMES IN LA*



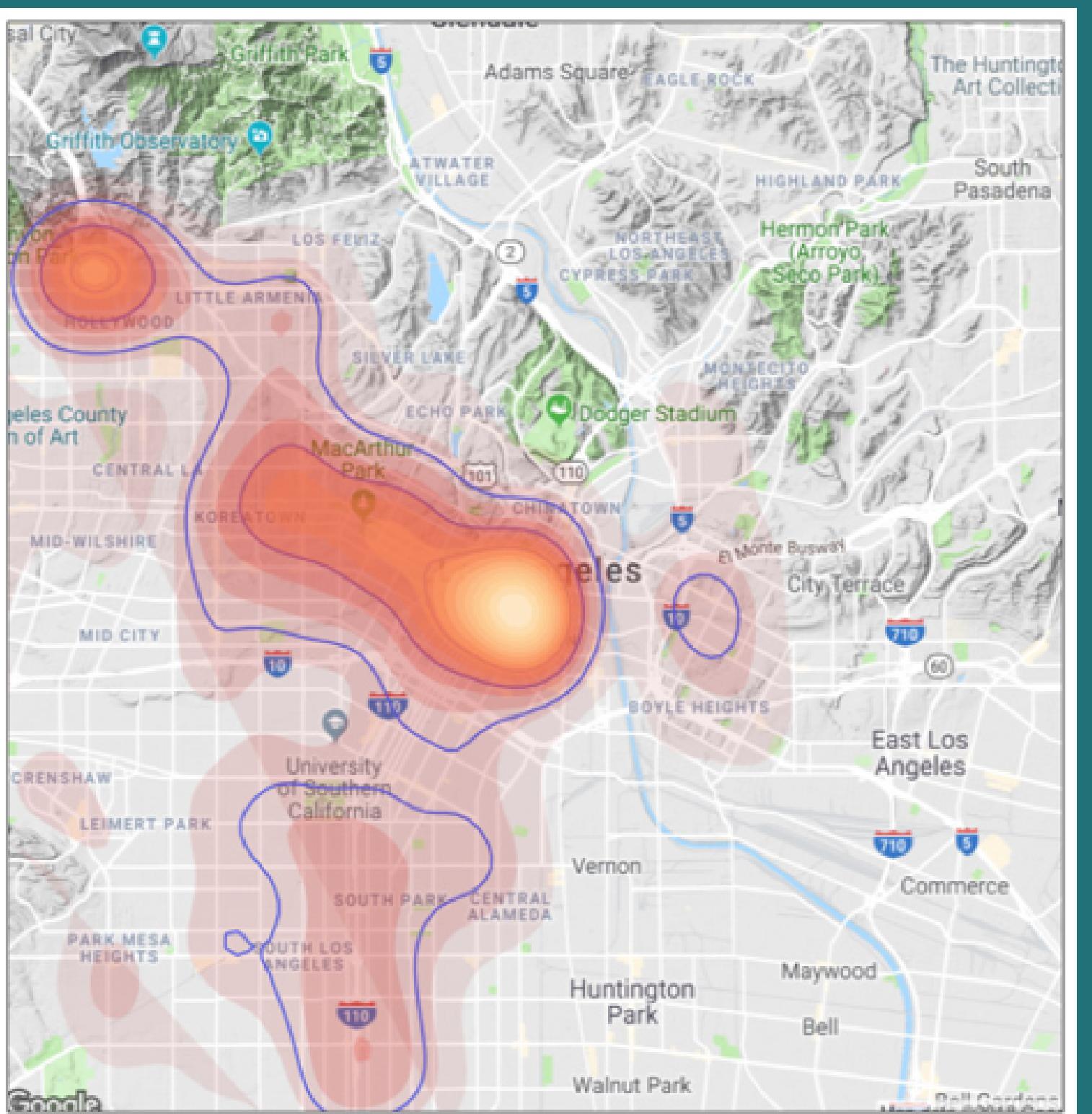
TOP 5 CRIMES IN USC*



*2015 - 2017

Battery in LA

Downtown LA had maximum reported battery in 2017



SOCIO ECONOMIC FACTORS

1. Random Forest Classifier to predict crime intensity based on Socio-Economic factors for a given area in LA



Areas with low crime

Areas with medium crime

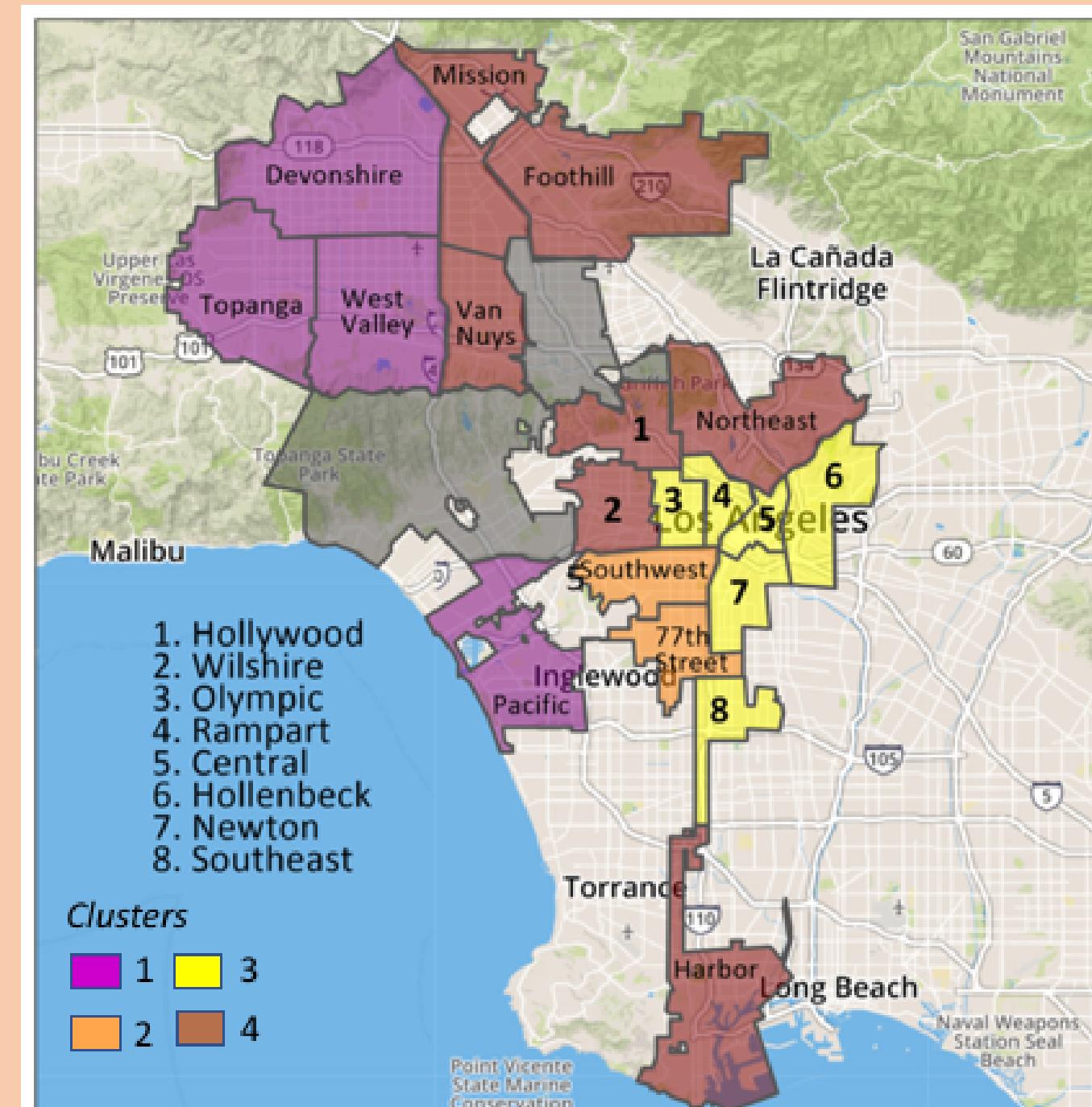
Areas with high crime

ACCURACY : 88.7

PRECISION : 86.7

RECALL : 87.2

2. K-Means Clustering of Neighborhoods based on Socio-Economic Factors and Crime (K = 4)



1 Cluster 1 is an affluent region with high income, rent and home ownership. Identity theft and burglary are most common crimes in this area.

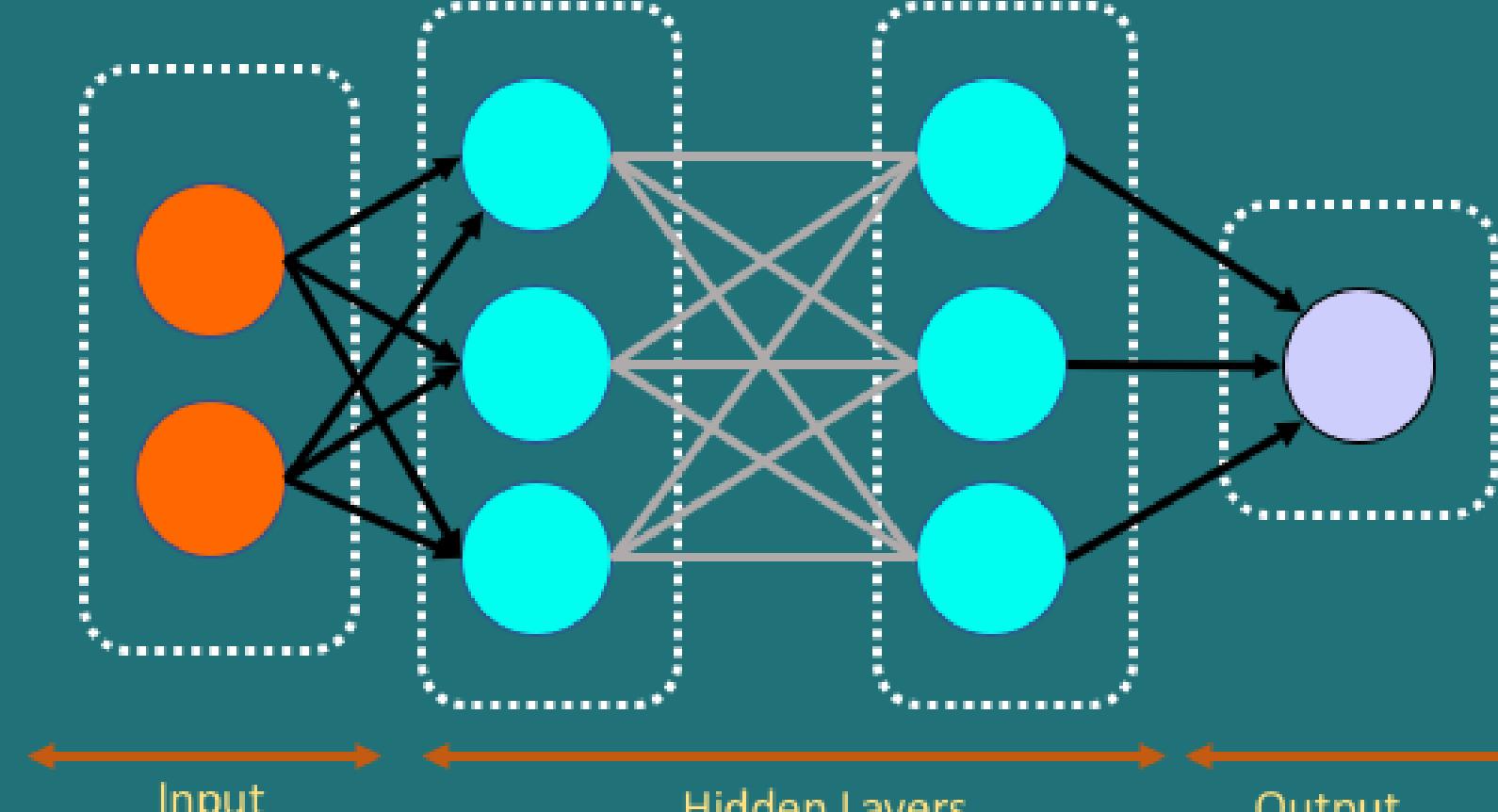
2 Cluster 2 is an economically weak area with low rent, low income, and medium homeownership. However, this cluster has the highest crime count with battery and assault as major crimes.

3 Cluster 3 is the most economically weak area with low rent, income and homeownership. The major crimes are battery and stolen vehicles.

PREDICTING CRIME

1. Deep Learning for Predictive Policing

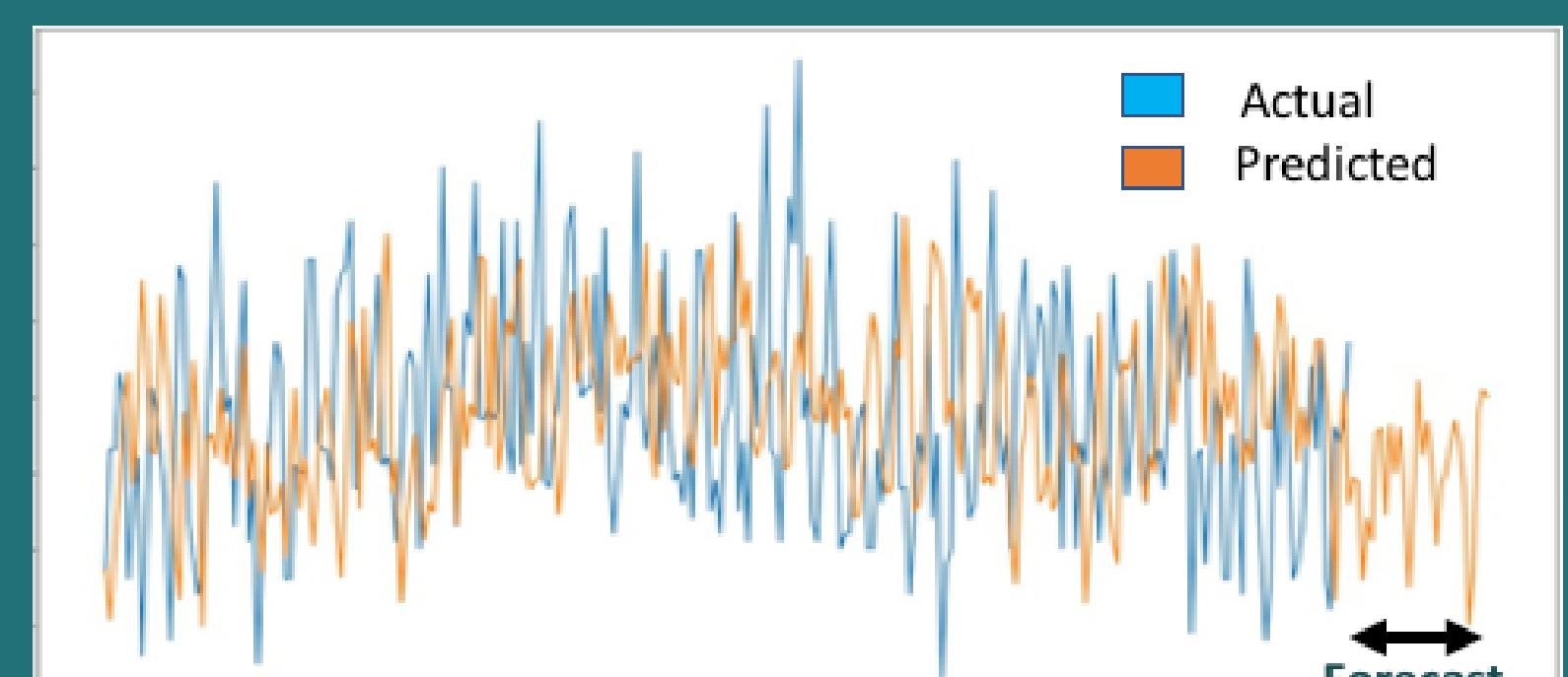
- Regression on crime location, date, time and category
- Predict probability of crime at any location based on above attributes
- It will allow police to be smarter and make data driven decisions everyday



2. Frequent Crime Patterns using Apriori Algorithm



3. Auto Regression for Short Term Forecasting



- Plot of Crime Count vs Date (2017)
 - Auto Regression using Long Short Term Memory (LSTM) for crime count
 - This will allow authorities to forecast the crime in the short term and be prepared accordingly
- RMSE: 14
MAE: 10.86
Time Steps: 7