Smart Policing in Detroit, MI, U.S.A. using Foursquare API

# Introduction:

According to the United States Federal Bureau of Investigation’s Uniform Crime Report in 2017, Detroit ranked among the top three most dangerous cities to live in in the United States, in terms of the rate of crimes reported (1). Although the city has recovered its economic status as a major metropolis after the economic recession of 2008-2009, the city is still plagued by high rates of violent crimes. With limited resources available from taxpayers’ money to spend on public safety and the police department, the city of Detroit faces the problem of how to most efficiently organize policing (i.e. patrols, officer stations) to maximize its effects on curbing the rate of violent crimes and enhance public safety.

To answer this complicated problem, the city of Detroit could begin by focusing on the geography of crime: where crime occurs. Are there hotspots of criminal activity in the city? Where would people be found near these crime hotspots? Are there similarities between locations where crime was perpetrated with other locations in the city where crime was also reported? These three questions, if answered satisfactorily, could provide significant insights into the patterns of criminal activity in Detroit and aid in the efficient allocation of police and public safety resources such as stations, patrols, and 9-1-1 emergency kiosks. For example, by finding the hotspots of criminal activity, permanent police stations or 9-1-1 dial booths could be built in the vicinity to enhance public safety. Knowing the locations where large amounts of people could likely be found near these crime hotspots makes the delivery of emergency information and services faster. Understanding the similarities between locations of crimes in terms of features in the geographic vicinity helps police patrol more effectively. Using data science to investigate the geography of crime in Detroit, the city could begin to develop insights into the patterns of criminal activity in the city and boost Detroit’s police operations and public safety efforts.

# Data:

Datasets on public safety collected by the City of Detroit constitutes a significant portion of this data analysis effort. In particular, a portion of the “All Crime Incidents, December 6, 2016-Present” page on the City of Detroit Open Data Portal (2) will be used. The City of Detroit’s crime data can be extracted either via downloading the entire dataset in a spreadsheet format, or via GeoJSON/JSON. To save computing power and time, as well as to provide the most current thus relevant information, only data from the year 2019 will be considered in the analysis. The City of Detroit’s “All Crime Incidents” dataset contains such information as the address of the crime reported, the type of offense, the neighborhood, and the latitude and longitude. The City of Detroit’s crime data by itself could provide an insightful preliminary data exploratory analysis into the location of potential criminal hotspots based on geographic information, using machine learning algorithm such as DBSCAN. This could aid in directing public safety efforts and service delivery.

In addition to the City of Detroit’s data, this project will also query Foursquare API for the popular/recommended venues near the recorded crimes’ geographic vicinity. With the Foursquare API data, we could discover similarities between locations where crime has occurred, based on what is around the crime locations, using clustering algorithms such as K-mean clustering on the Foursquare API data. This also could help direct and tailor public safety resources and services to fit the features of locations prone to criminal activities.

References:

1. <https://www.usatoday.com/picture-gallery/travel/experience/america/2018/10/17/25-most-dangerous-cities-america/1669467002/>
2. <https://data.detroitmi.gov/datasets/all-crime-incidents-december-6-2016-present/data>