America's Warzone: Predicting Gun Violence in Chicago

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Abstract

This paper is poop.

1 Introduction

When one thinks of crime in America, Chicago is a city that often comes to mind. Donald Trump frequently discusses the issues of crime in Chicago. According to the Chicago Tribune, there were 4,367 shooting victims in Chicago in 2016. In the same year there were also 785 homicides.[2] However, other reports cite that Chicago should not be called the crime capital of America. Its violent rate is less than other cities such as St. Louis and Detroit. [1] This project examines crime in Chicago, specifically armed robberies, from 2011-2017.

2 Data

The crime data used for this project comes from the City of Chicagos website. [1] The data contains every reported crime in Chicago from 2001 to present day. In addition to the type of crime reported (battery, assault, etc.), there is information on the location, time, and other details. The data set was reduced to only armed robberies.

3 EDA

4 Time Series Analysis

4.1 Models

The city of Chicago is divided into neighborhoods known as sides. These areas can be seen in Figure 2. The borders below are the boundaries of the community area colored by the side.

Models were fit to predict the counts of armed robberies in each side between 2003-2016. In order to determine the type of model, the ACF and PACF plots were examined for the data for each of the sides. For example, if there was structure in the PACF plot beyond one lag, moving average terms

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[1]Crimes 2001 to present, https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2/data

ID	Case Number	Date	Block	IUCR	Primary Type	Description	Location Description
10918167	JA231660	04/19/2017 11:58:00 PM	002XX N SACRAMENTO BLVD	041A	BATTERY	AGGRAVATED: HANDGUN	STREET
10921561	JA235113	04/19/2017 11:55:00 PM	006XX S CLARK ST	0281	CRIM SEXUAL ASSAULT	NON-AGGRAVATED	APARTMENT
10918133	JA231652	04/19/2017 11:51:00 PM	015XX W THOME AVE	031A	ROBBERY	ARMED: HANDGUN	STREET
10918777	JA232089	04/19/2017 11:45:00 PM	052XX W BELMONT AVE	0910	MOTOR VEHICLE THEFT	AUTOMOBILE	STREET
10918201	JA231633	04/19/2017 11:45:00 PM	116XX S ASHLAND AVE	1020	ARSON	BY FIRE	RESIDENCE
10921151	JA232118	04/19/2017 11:40:00 PM	070XX S CLYDE AVE	0486	BATTERY	DOMESTIC BATTERY SIMPLE	APARTMENT
10918154	JA231651	04/19/2017 11:37:00 PM	110XX S NORMAL AVE	031A	ROBBERY	ARMED: HANDGUN	SIDEWALK
10918105	JA231645	04/19/2017 11:35:00 PM	034XX W OHIO ST	0560	ASSAULT	SIMPLE	RESIDENCE
10918173	JA231643	04/19/2017 11:34:00 PM	011XX W BRYN MAWR AVE	0520	ASSAULT	AGGRAVATED:KNIFE/CUTTING INSTR	RESTAURANT
10918164	JA231644	04/19/2017 11:30:00 PM	012XX W MARQUETTE RD	0497	BATTERY	AGGRAVATED DOMESTIC BATTERY: OTHER DANG W	RESIDENCE
10918168	JA231662	04/19/2017 11:30:00 PM	029XX N KENOSHA AVE	0610	BURGLARY	FORCIBLE ENTRY	RESIDENCE
10918182	JA231695	04/19/2017 11:30:00 PM	005XX W 60TH PL	0910	MOTOR VEHICLE THEFT	AUTOMOBILE	STREET
10918205	JA231732	04/19/2017 11:30:00 PM	072XX S CAMPBELL AVE	0486	BATTERY	DOMESTIC BATTERY SIMPLE	RESIDENCE
10918203	JA231708	04/19/2017 11:30:00 PM	054XX W POTOMAC AVE	0420	BATTERY	AGGRAVATED:KNIFE/CUTTING INSTR	APARTMENT
10918131	JA231630	04/19/2017 11:26:00 PM	074XX S STATE ST	0860	THEFT	RETAIL THEFT	GAS STATION
10918137	JA231637	04/19/2017 11:25:00 PM	072XX S COTTAGE GROVE A	0460	BATTERY	SIMPLE	CTA BUS

Figure 1: The city of Chicago website provides a data set containing information on crimes commited in the city from 2001 to present day.
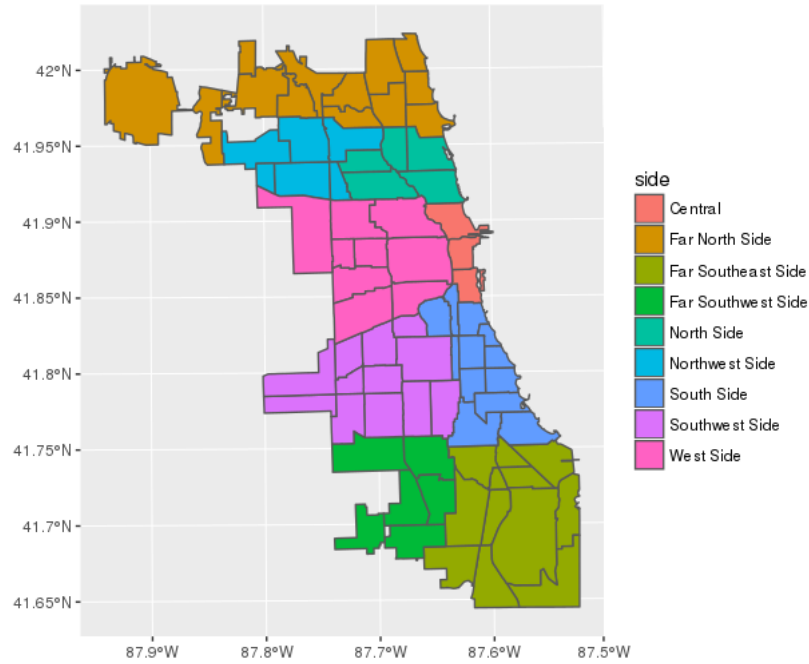

Figure 2: The "sides" of Chicago.

were added. The model residuals were also examined to ensure there was no remaining structure in the resiudals.

References

[1] Papachristos, Andrew V., "48 Years of Crime in Chicago: An Analysis of of Serious Crime Trends from 1965-2013, http://isps.yale.edu/sites/default/files/publication/2013/12/48yearsofcrime_final_ispsworkingpaper023.pdf, December 2013.

[2] Pearson, Rick, "Trump Again Assails Chicago gun violence in speech to Congress", *Chicago Tribune*, http://www.chicagotribune.com/news/local/politics/ct-donald-trump-congress-speech-chicago-met-20170228-story.html, March 2017.

5   Appendix

5.1   Time Series Modeling Plots