An Investigation Into What Causes Crash Injuries, Fatalities

Using crash data from the City of Chicago, Summer 2018

Nabil Darwich  
 Department of Computer Science  
 George Mason University  
 Fairfax VA USA  
 ndarwich@gmu.edu

Hamza Mughal  
 Department of Computer Science  
 George Mason University  
 Fairfax VA USA  
 hmughal2@gmu.edu

ABSTRACT

This paper offers insight into what factors lead to injuries/deaths during car crashes.

1 Data Pre-Analysis

1.1 Visualization of Car Accidents in Chicago

During the summer of 2018, there were approximately thirty thousand recorded car crashes throughout Chicago, as reported by city officials. Recorded information about these crashes ranged from data about the incident’s occurrence, such as geolocation, to data about the driver, such as their sex.

Naively mapping the latitude and longitudes with matplotlib’s pyplot yielded an image similar to the shape of Chicago as it can be seen here:



Not being able to discern much information from this map, though, we decided to plot each accident against an actual map of Chicago. This was accomplished using Baseplot in python along with associated helper files. Mapping the accidents on an actual map yielded much more informational results:



While this graph was helpful in visualizing our data, it was very intriguing how one location in the Southeast had very few crashes. Thus, an investigation into why that is the case took place. The population map of Chicago revealed that only a few individuals lived in that location, with a vast majority of them choosing to live along the center of Chicago, rather than its outskirts.



From this map, the suspicion that the majority of car accidents would occur throughout the densest areas of Chicago naturally came about, and mapping the accidents against the population densities seemed to corroborate our hypothesis:



As can be seen from the map above, the outskirts of Chicago have fewer accidents, with the majority of accidents being in the center of Chicago, where it is most dense in population.

**1.2 Visualization of Car Accidents in Chicago**



Figure 1: Injury Severity vs. Posted Speed Limit

Quotation or Extract. 

Figure 2: Weather Condition vs. Crash Severity



Figure 3: Lighting vs. Crash Severity

1.1 Heading Level 2

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4. In the "Title:" and "Description:" text boxes, type the text you want to represent the picture, and then click "Close".

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REFERENCES

[1] FNM Surname (2018). Article Title. Journal Title, 10(3), 1–10.

[2] F.N.M Surname, Article Title, https://www.acm.org/publications/proceedings-template.

[3] F.N.M Surname and F.N.M Surname, 2018 Article Title, The title of book two (2nd. ed.). Publisher Name, City, State, Country.

[4] Ian Editor (Ed.). 2018. *The title of book two* (2nd. ed.). University of XXX Press, City, Chapter 100. DOI: <http://dx.doi.org/10.1000/0-000-00000-0>.

FirstName Surname, FirstName Surname and FirstName Surname. 2018. Insert Your Title Here: Insert Subtitle Here. In *Proceedings of ACM Woodstock conference (WOODSTOCK’18). ACM, New York, NY, USA, 2 pages.* https://doi.org/10.1145/1234567890

Conference Name:ACM Woodstock conference

Conference Short Name:WOODSTOCK’18

Conference Location:El Paso, Texas USA

ISBN:978-1-4503-0000-0/18/06

Year:2018

Date:June

Copyright Year:2018

Copyright Statement:rightsretained

DOI:10.1145/1234567890

RRH: F. Surname et al.

Price:$15.00