CGT 270 DATA VISUALIZATION

Analysis and Visualization of Environmental Causes on Automobile Accidents in Dense Traffic Float Areas

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Driving has become one of the most efficient ways to commute in past decades. Yet, there are over 3,200 fatalities caused by car accidents each day. Our society tends to blame the factors of these casualties on individuals—speeding, not paying attention to the road, and drowsy driving. However, possible external causes of car accidents are often overlooked. Horrible road conditions, confusing road signs, baffling weather, and pedestrians crossing the street in the driver's right of way can all be crucial external factors of a car accident. In the 2016 article "Adverse Weather Conditions and Fatal Motor Vehicle Crashes in the United States," Shubhayu Saha hypothesized that weather and road conditions might increase the likelihood of motor vehicle fatalities. Saha found that weather-related fatalities constituted about 16% of total fatalities.

After reviewing different resources and articles about environmental conditions and their effect on car accidents, I decided to examine major exterior environmental causes of car accidents, such as road surface conditions and light source, in U.S. cities with dense traffic. I attempted to provide a more transparent insight into these accidents with my visualized data analysis.

I found a publicly available data set from data.org published by the State of Maryland summarizing the number of car accidents that occurred from 2015 to 2017, the condition in which they took place, and the cars that were evolved. Because all of the databases are Excel files, I was able to import them into Tableau, a data visualization program, to analyze and represent them. The original author separated car accidents into 17 different categories; by filtering out different factors and analyzing them, we can acquire a better insight into which accidents are related with what kinds of environmental condition.

The results I got are different from my hypothesis. Most common kind of accident is single vehicle, and rear-end accidents and most accidents happen during clear weather and dry road conditions. We can make a safe assumption that lighting and road surface conditions do affect drivers' decision making and performance. We can also conclude that single-car accidents are most likely to happen with a negative environmental condition. But the weather does not have a significant impact. Although the causes of single-vehicle and rear-end accidents are not consistent, we can hypothesize that although environmental conditions do make a slight impact, drivers have to cause all time to avoid future fatalities at best based on the way higher rate of accidents that occurred on a typical environmental condition.

Byrd writes: "Danielle's work is an example of how the process of data visualization allows for the detection of patterns in data that are not easily discernible by human visual inspection alone. The analysis and visualization of environmental causes on automobile accidents in dense traffic flow areas helps to inform motorists and other stakeholders of traffic flow areas prone to automobile accidents."