Project Proposal

Basic Info

Project title: mass shootings and gun violence in contemporary american society

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github repository: https://github.com/lqian5/Project_Visualization

Website: https://lqian5.github.io/

Background and Motivation

Mass shootings aren't uniquely American events, however no other western countries seem to face this particular form of public violence so frequently. Much noise has always been made about these questions in sensationalist US media, however following two particularly gruesome and indiscriminate mass shootings in late 2017 and early 2018, there seems to be a recent re-evaluation of our stance on guns and violence in private conversation as well.

Related Work

Visualization on Mass Shoot has been done in many contexts, including on Washington Post (https://www.washingtonpost.com/graphics/2018/national/mass-shootings-in-america/?utm_term=.8aa6e2867bed), on Mass Shooting Tracker (https://www.massshootingtracker.org/data/2018), on Periscope (https://guns.periscopic.com/?year=2013) and on USA Today (http://www.gannett-cdn.com/GDContent/mass-killings/index.html#explore). Furthermore we like these visualizations as well: https://source.opennews.org/articles/visualizing-mass-shootings/ , http://www.storybench.org/mass-shooting-data-visualizations/

- Washington Post creates an interactive visualization on the number of victims and the number and types of guns, represented as mini human figures and gun images. The interaction includes hovering, clicking and tooltips.
- The Mass Shooting Tracker has a stacked bar plots showing the number of killed vs dead, also with an interactive tooltip.
- Periscope has made moving dots on parabolas to represent the path of humans, but for people were shot (not necessarily in mass shoot event), those dot fell off from the parabolas.
- USA Today displays map of mass killings since 2006. An detailed information displays when the mouse hovers on each dot.
- The use of color in the last two examples is great to bring attention to the division between people injured and killed in these situations. The interactive barchart, use of BRUSHING.

Project Objectives

What are the social costs to mass shootings? What are the identifying characteristics of their perpetrators, and what weapons do they use in their attacks? What is the breakdown, timeline, and evolution of this phenomenon in the States? What are the motives behind mass shooters? What correlations exist in observable factors, and how is the data distributed? We would like to paint a comprehensive picture of the major components of mass shootings in the US, while sticking to the facts and keeping partisanship out of our report. We would like to first raise awareness to the emotional consequences of these heinous acts through a map visualization that also gives basic stats around each famous event. We then would also like to visualize the characteristics of mass shooters, and their motives if known through a radar plots. This would

be in order to understand any relationship between predictive elements of this violent behavior and visualize catalysts of gun violence if possible - again to raise awareness and statistical literacy on this issue. Lastly, we wish to breakdown the types of weapons used per type of attack, and use color to highlight what areas would be affected by currently proposed regulation, and potential future regulation.

If we have time, it would also be nice to compare the fatality numbers of mass shootings in America to other violence statistics around the world, and visualize the cost of these acts to our society in a new and memorable way.

Data

We've found lots of mass shooting related data from different sources. All will be looked at but not all will be used in the final visualization.

https://www.kaggle.com/residentmario/exploring-mass-shooting-events/data

https://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data/

https://library.stanford.edu/projects/mass-shootings-america

https://www.washingtonpost.com/graphics/2018/national/mass-shootings-in-america/?utm_term=.78eb631f4ba9

https://www.massshootingtracker.org/data

http://www.shootingtracker.com/

As well as various datasets from the CDC more generally, and their equivalent sources from other national agencies across the world.

International violence metrics to be gathered from U.N. sources.

Tools and Languages

We plan to use following visualization tools and languages in this project:

- Tableau, for basic histogram or bar plots

- Python (matlibplot, plotly, bokeh), for more complicated and interactive plots

- HTML and Javascript, to embed visualizations in our website

Data Processing

From looking at the above data sources, the main challenge will be to parse text fields for meaningful words and phrases. Text standardization (Shotgun = shot gun, etc…) across datasets is also a concern for text fields, and we predict some time will be spent on this step. The age column has 'unknown', nan and '32\r+ Unknown'. Compiling existing datasets into one will also present merge conflicts, which we will have to deal with.

Visualization Design

The three main visualizations we want to to convey are:

- An interactive map of the United States showing where incidents of mass shootings occured. As you scroll over the locations of the incidents, popup dialogues show the stats of the attack, text messages exchanged between victims, and perhaps even have audio of police responding to the event play on cue. We hope this to be an emotional exploration of these past events, and drive home the lasting damage to society these acts cause.

- We then would also like to visualize the characteristics of mass shooters, and their motives if known through a radar plots. This would be in order to understand any relationship between predictive elements of this violent behavior and visualize catalysts

of gun violence if possible - again to raise awareness and statistical literacy on this issue.

- We wish to breakdown the types of weapons used per type of attack, and use color to highlight what areas would be affected by currently proposed regulation, and potential future regulation. This plot should also put mass shootings into context with overall gun violence in the US. This would be a treemap, or circle packing visualization.

Some example plots are attached in the end.

Must-Have Features

As mentioned in our basic objectives, we must represent to our audience at least:

- Location of, and consequences of mass shooting events

- Traits, attributes and motives of the shooters

- The breakdown of frequency, factors, and consequences of mass shootings, their correlations and warning signs

- A timeline of evolution for mass shootings in american society

- A breakdown of gun types used in the mass shoot

Optional Features

- How proposed legislation would affect what types of violence

- The breakdown of gun violence in america across basic types of acts

- Comparison of the types / levels of violence among other western nations

- More general questions about US society's overall levels of violence, and if that offers a lens through which to view gun violence
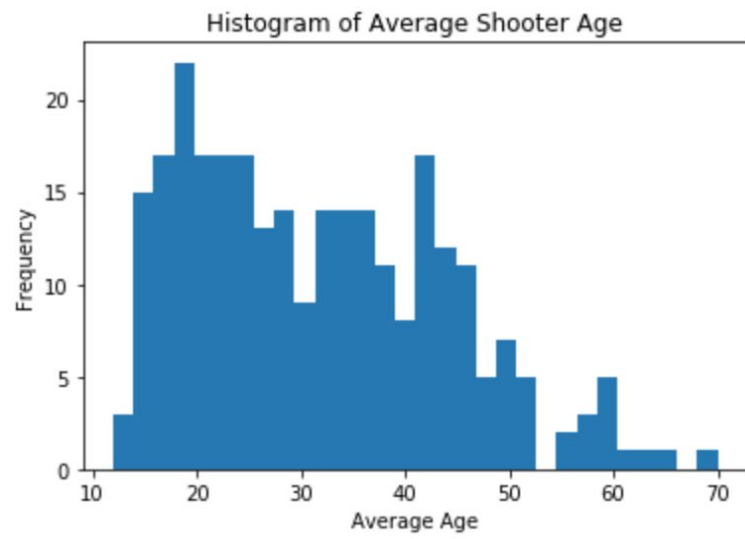
Project Schedule

- Week 1: Finalize datasets and project direction

    - 4/17: Submit project proposal in the morning.

    - 4/18: Set up a public website, which is due 4/19.

    - 4/19: Each team member choose one dataset to work on.

    - 4/21: Share results, select and submit one visualization in Python notebook.
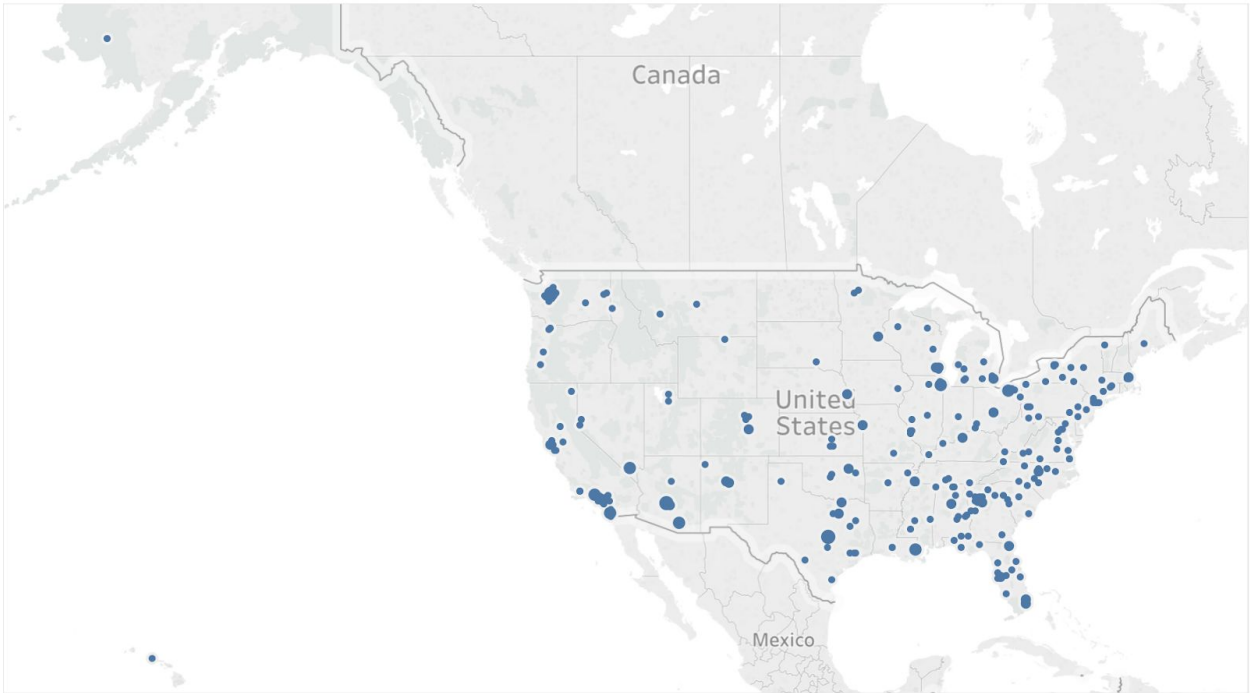   At this time, we should have a better idea and will split future work by datasets or visualizations.

- Week 2: Have working prototypes of all types of graphs we want to implement

    - 4/26: Create all visualizations (may not include all features) that we proposed

- Week 3: finalize content that we want to display

    - 5/3: Finalize visualizations

    - 5/4: Publish contents on the public website

    - Weekend: Prepare slides and last changes

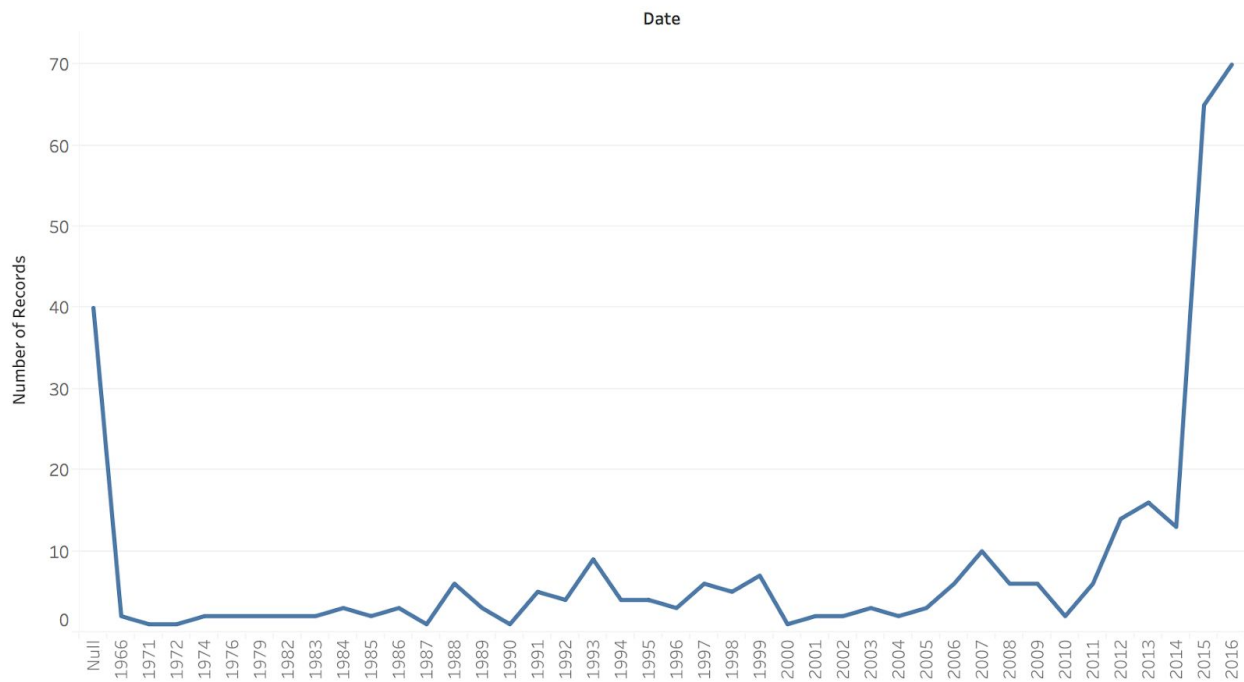- Week 4: Prepare presentation

Plots/Attachments

The below plots include the draft of our three main designs (world map, radar plot and treemap) as well as exploratory plots on the data (age distribution, time plot of mass shoot occurrences, and number of injuries/fatalities by shooter's average age).
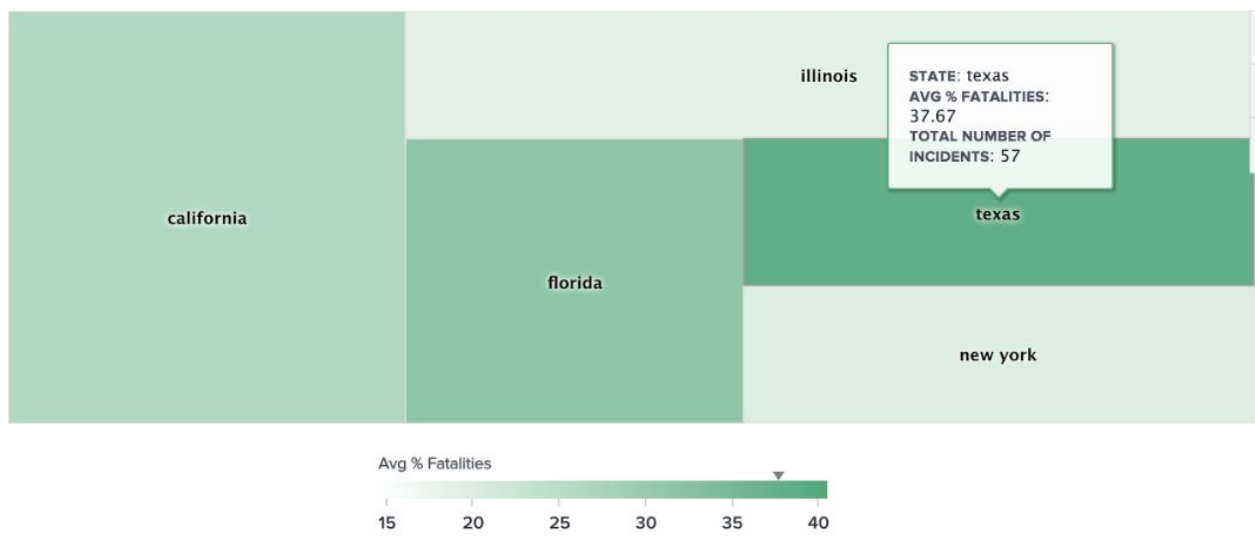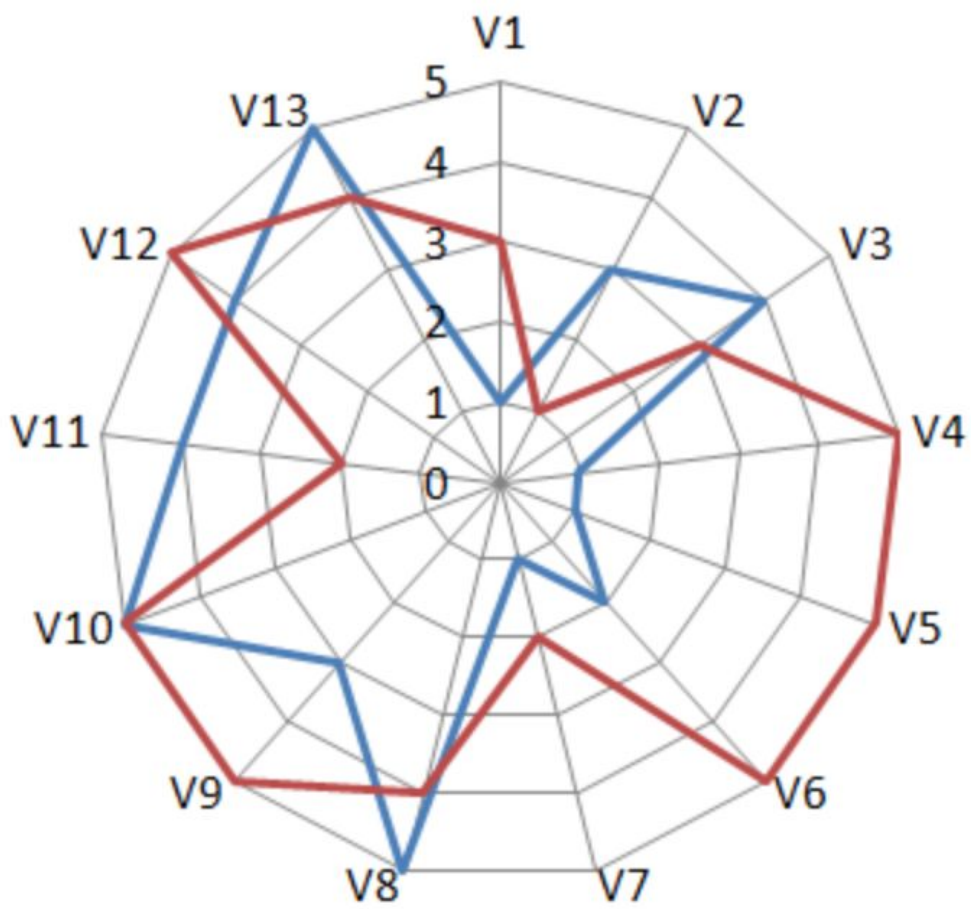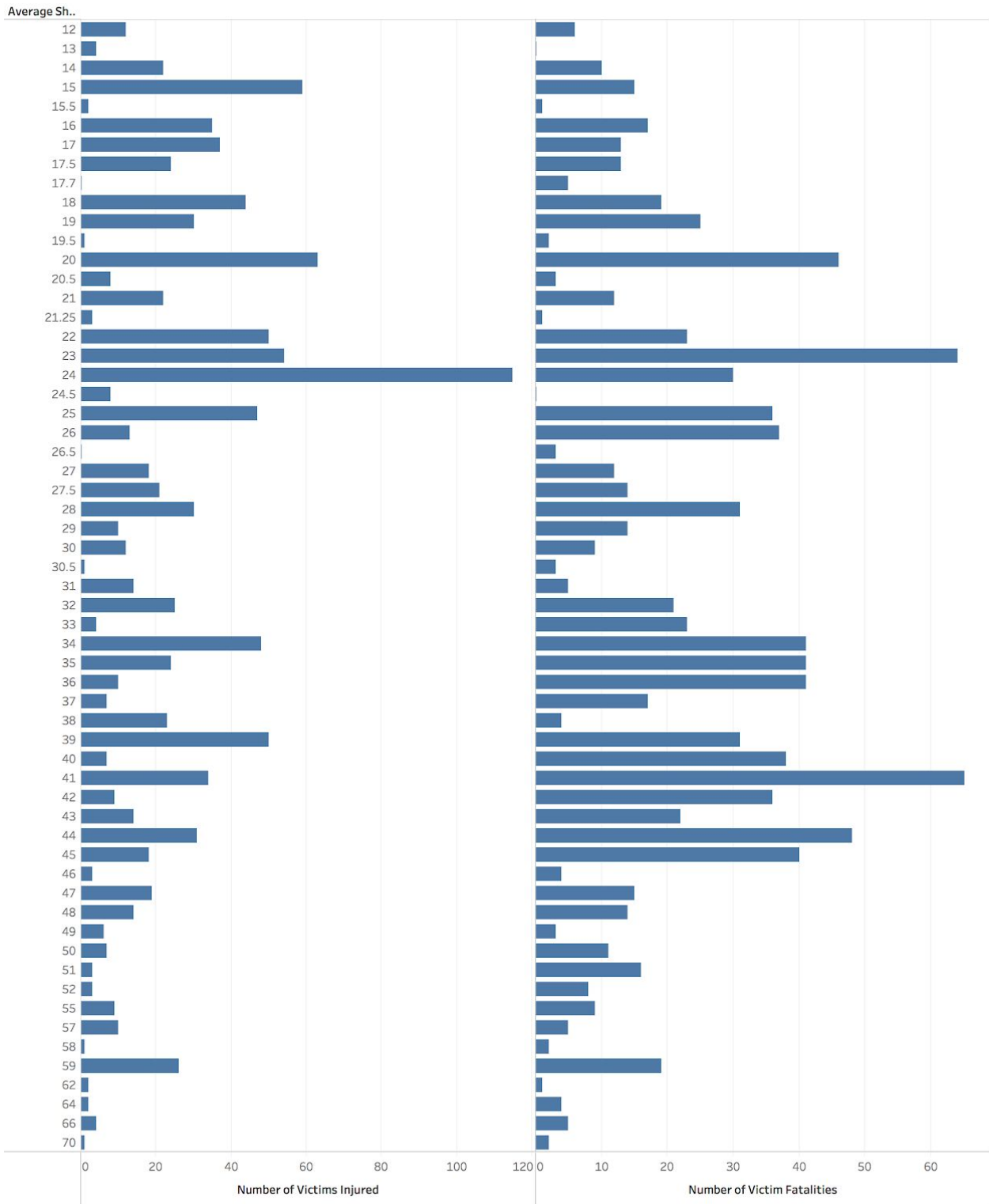
<Map of Mass Shoot in USA>

<Trend of Mass Shoot occurences>

Date

The trend of sum of Number of Records for Date Year.

STATE: texas
AVG % FATALITIES: 37.67
TOTAL NUMBER OF INCIDENTS: 57

illinois

california

florida

texas

new york

Avg % Fatalities

15   20   25   30   35   40

<Number of Injuries and Fatalities By Shooter's Average Age>

Average Sh..

Number of Victims Injured   Number of Victim Fatalities

Sum of Number of Victims Injured and sum of Number of Victim Fatalities for each Average Shooter Age. The view is filtered on Average Shooter Age, which keeps 59 members.