

Process Book

Campus Safety

Link: <https://danielwwong.github.io/DataVisFinal/>

Team:

Name	Email	GitHub ID
Zhanfeng Huang	zhuang4@wpi.edu	danielwwong
Qiankun Li	qli6@wpi.edu	Qiankun0103
Yujun Tian	ytian5@wpi.edu	duoshyyigirl

- Overview and Motivation

Motivation:

When people select college, campus safety is a very important factor to consider. When we foreign students planned to study abroad, we really want to know how safe the college is, the states is. Fortunately, we found data from *Campus Safety and Security*, which provides detail US college crime data.

Overview:

We tried to plot the data by two parts. First, the overview of our map is an US map, surrounded by many bar charts. The US states map are marked by color code, when the states are marked by darker color, it means that the states are less safe than states with light color. When viewers mouse over specific state, the corresponding state would be highlighted. If viewers further click it, the map would shrink and detail information about the state would show by bar charts below. The bar charts will draw all the states information as an x axis, and if viewers hover the mouse over specific state in the map, the corresponding bar would be highlighted. The bar charts would cover information including gender rate, number of crime and schools' attributes. Second, we planned to add another part, which can provide us with several filters. The filter contains gender rate, years, whether the school is private or public, how many years the school offers, states choice. Once the user has made his choice, the US city map would map top 5 safest and top 5 dangerous schools' place on the US map. We want to help parents and students to study in their satisfied collage. And hope this website could provide useful information.

- [Related Work](#)

We watched a TV program, it said there have 35 Chinese students died on America in 2016. It shocked us, so we decided to study the college crime data.

In light of visualization part, professor in class introduced interactive multiply chart, which made us very interested. When user click the big map, it shrinks to a corner, and present three bar charts near it. These bar charts can interact together. When hover your mouse on a particular state, all the bar charts will highlight the specific bar of the state.

- [Questions](#)

- How about the degree of the crime in US?
- How many crimes happened on US state?
- The detail of school crime.
- How to choose safety collage?

- [Data](#)

Source: <https://ope.ed.gov/campussafety/#/datafile/list>

Data scraping:

As so far, we used the “noncampuscrime121314.xls” sheet.

Data cleanup:

We have done substantial data cleanup, but we may do more in future. What we have done include:

1. Drop all null value records by Python’s pandas.

2. Zip code subtract by “awk” command:

In the original data, the record in Zip code column includes 8 digits, 9 digits, 5 digits and 4 digits. To make it corresponding to our “cities.json” file, we subtract first 5 digits of the 9digits zip, first 4 digits of the 8 digits zip, and add leading 0 to the 4 digits. We achieved this by “awk” command.

3. Split one column into two by Python’s pandas:

The “Sector_desc” column used to contain information like “public, 4 year or above”. We think this can convey two kinds of information, so we split it into two columns, one shows “public” and another one shows years.

4. Add the information up to states information by Python’s pandas:

Since not all the schools have crime records, so we aggregated all the schools' information up by states' categories. Thus, we could present states information in the data visualization.

- **Exploratory Data Analysis**

Initially, at the first sight of the data, we tried to map all the college information on to the U.S map. But in light of the number of the colleges of U.S, all the points will be assembled, which was a mess. So, we further informed our design by categorizing the data by states. States data offer benefits, such as crime numbers are more obvious, the whole overview is more concise and beautiful. This is why we had the map as states information. Also, viewers may show curiosity to which school is safer or how dangerous it is. From that point, we would provide a filter to satisfy viewers need of checking the school's information.

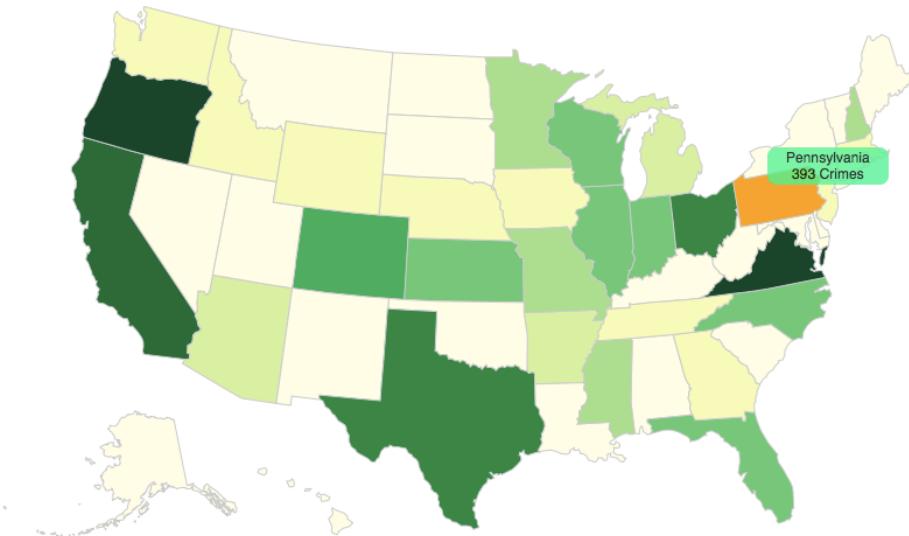
- **Design Evolution**

When the mouse click the state, the color could be changed It is convenient to observe. At the same time, the map would shrink in the top of left. When hover the mouse, the bar chart would interactive with the state. For example, when the mouse over the MA, the bar which indicates the MA states' data would be highlighted. And our filter is very useful, it could search safety collage very fast in the different state. In our visualizations, most of them are bar chart, because the bar chart is straightforward and easier to compare. We pay more attention to the color, we want to design the image more beautiful, which would attract user eyes. Because we change a new data, and spent a lot of time to find this campus safety data, but now our achievement is not deviate second proposal.

- **Implementation**

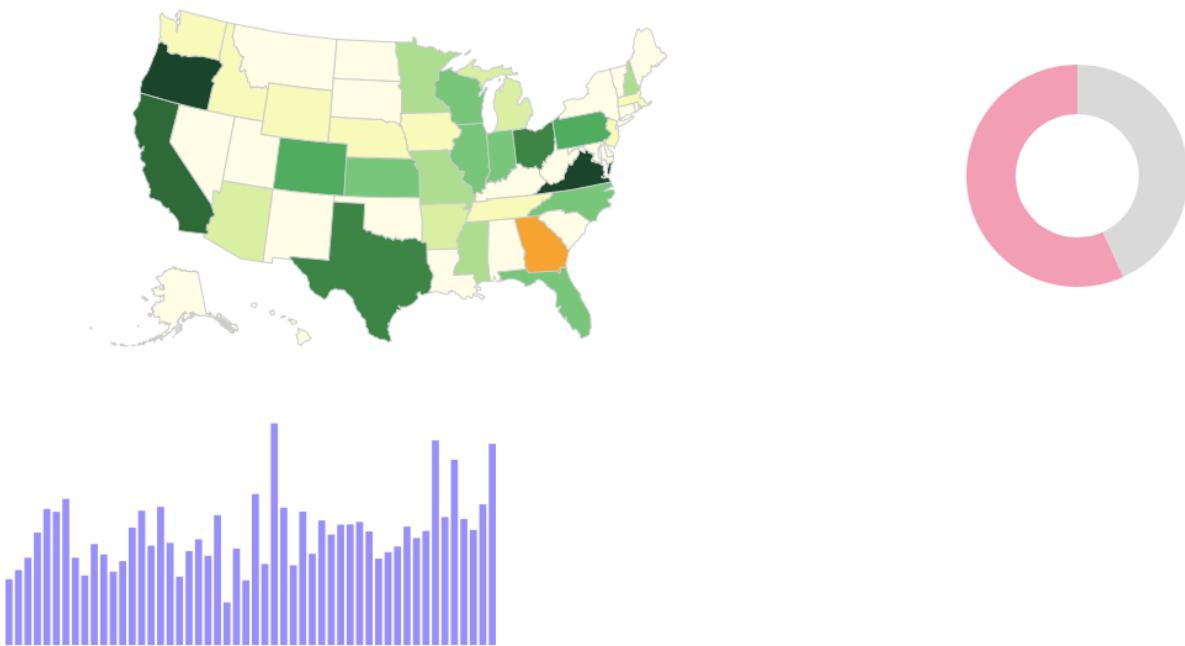
We hope our project could help people to find a satisfied college, provide useful information and convenience to select safety college.

Crimes in U.S. University

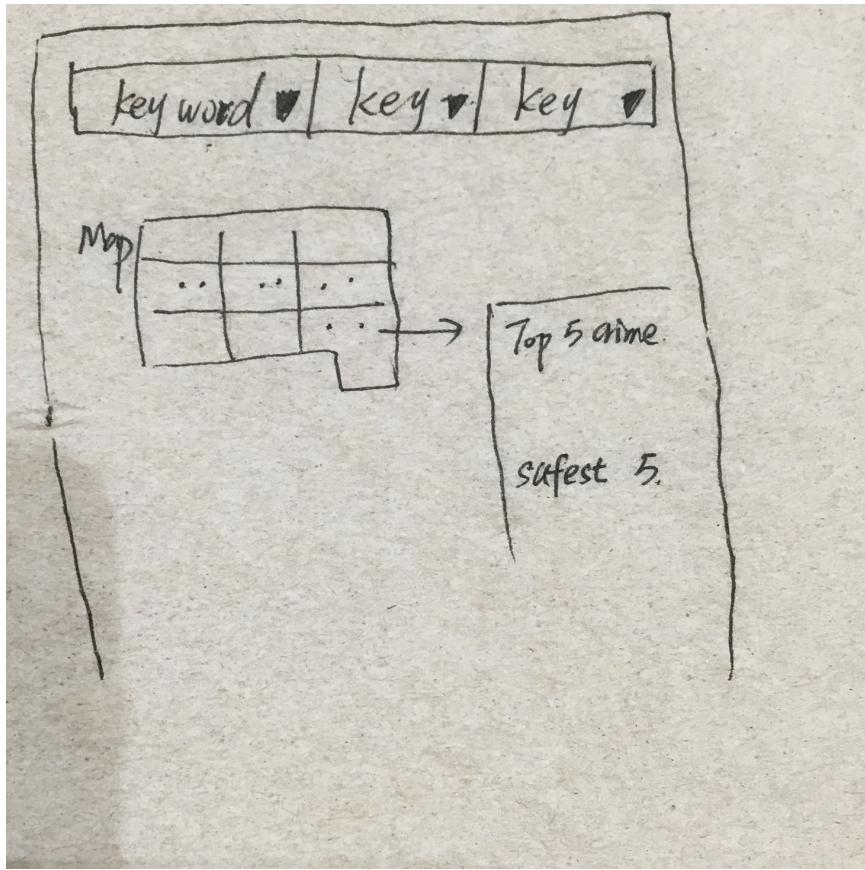


This is the bigger map, if the mouse over the state, then it would show the information of this state.

Crimes in U.S. University



We not finish it, but in the next week, we will make the bar charts interactive with the smaller map.



This is our filter. We will finish it as soon as possible.

- **Evaluation**

It is easier to read our visualizations, the process is not hard, just need move the mouse. Using our visualization, the image is straightforward to show the information. The color dark or light show the crime level. If the color light, then it is a safety College. And the bar chart would describe the number of college in different state. Using the filter would provide the top 5 crime or safest 5 colleges.

In the next project, we want to use the zip code to locate the collage, which would show on the state map. And the number of different crime would show on the bar chart. Such as, murder, shooting, rap and so on. We will try to make our website more beautiful, then attract audience eyes.

