Rainbow Six: Siege Playstyle Visualizer David May & Brad Stone Interactive Visualization Final Project

Overview:

The Rainbow Six: Siege Playstyle Visualizer is an interactive visualization that aims to show the tendencies of top rated players of the video game Rainbow Six: Siege in an easy to read format. Each top player, as determined by the official Rainbow Six: Siege leaderboard, is plotted on our visualization and colored according to their grouping. These points are interactive, allowing users to click on a data point to reveal further statistics about the player in question.

Background:

Rainbow Six: Siege is a competitive video game produced by Ubisoft. It features a wide cast of characters that players must master to reach the top of their game. Our research looks at which characters the best players choose to master and to plot these players accordingly. There is no other research or visualizations in existence currently that are similar to this one.

Our visualization pulls its data from the official Ubisoft API, as well as data scraping from popular Rainbow Six: Siege "stat trackers" [1]. The relevant algorithms our visualization utilizes are principal component analysis (PCA) [2], which takes the 46-dimensional data of character playtimes and reduces the dimensionality down to 2, allowing a scatter plot. Furthermore, K-means clustering is applied on the original data for coloring of the points. The choice of K is selected by the "elbow method" that looks to gain the greatest explained variance for the least amount of K [3]. As for choice of colors, this visualization uses a color scheme generated by ColorBrewer [4].





15.0

17.5

Design Evolution:

Our first graphs of our data were just created using a much smaller subset of the data we have now to look at how the data would look like. These were not interactive but still showed roughly what we would be looking to create in D3. As we collected more data some patterns started to show.



This shows our finished visualization. There are around 200 data points and that reveals a much more interesting clustering as you can see what operators the top players use. There are a few outliers that have many hours in operators few other top players use. The side bar allows the user to see exactly how many hours each player has in each operator to see more about the data. One feature we didn't plan but we ended up adding was the ability to change how the data is clustered.

User Study:

A small sample size of 1 Rainbow Six: Siege player was interviewed and allowed to use the visualization. After a short explanation, they said they like the visualization and the colors used. They thought the visualization was interesting to use to see the general trend for better players, and how wide the possibilities are for different playstyles. One piece of feedback they gave is that the visualization should have a "dark mode", which was obliged.

Core Features:

The core feature of the visualization is the display of all top players of Rainbow Six: Siege and their playstyles in a concise two dimensional chart. In addition to this, each data point is clickable, bringing up statistics about that player and what characters they play. We used the D3 Javascript library to create our visualization. The initial design is based on a scatter plot example [5] by Peter Rossing. The data was collected by scraping top players usernames from an online leaderboard [1] and uses the R6 Python API to get the players stats.

Limitations and Challenges:

Unfortunately we were running into problems right from the start during data collection. The python R6 API limited the user requests on the api per day, limiting us heavily by slowing down data collection. Also for a reason we were never able to figure out the API never returned any data for the operator Caveira. The API was also limited in that the play times were not distinguished between ranked and unranked. This led to us not being able to collect exactly the data we wanted, but it was good enough to look at the different strategies the top R6 players used. When developing the interactive part to show the data D3 we were only limited by our own ability. It was a challenge for myself, Brad, as I have very little experience in D3 and almost no experience in html or css. Overall we were still able to create the visualization we were aiming for.

Potential Future Development:

One feature that could be added is the ability for the user to input their own username and then their data could be processed and plotted on the visualization. This would allow the user to compare their playstyle to the pros and would make it even easier to use this visualization to help yourself improve at the game. Another idea is with more freedom in the data collection we could add different options to change the graph to see different data such as specifying regions, platforms, or if we had access to previous years data we could even allow users to compare playstyles between R6 seasons. A search bar would also be extremely helpful because there are over a hundred data points and finding a specific point is nearly impossible.

Contribution:

David May contributed the development of the pca & k-means algorithms, as well as contribution to the site display of the visualization, such as the scatter plot layout and colors. He also contributed evenly to the writeup and presentation. Brad Stone contributed all of the data collection from the Rainbow Six API. He also developed parts of the site display of the visualization, such as the interactivity. Brad also contributed evenly to the writeup and presentation. Works Cited:

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[6] R6SAPI

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