What a Save!

Project Proposal

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https://github.com/Tyler2440/What-a-Save-

Background and Motivation

For our project, we wanted to base it off of something that both of us know and enjoy, and Rocket League was the perfect choice. We enjoy watching, playing, and talking about Rocket League, so we decided to make a visualizing website that shows off statistics related to it. Rocket League is a video game that pits players against each other in soccer matches that are either 1v1, 2v2, 3v3, or 4v4. However, Rocket League isn't just simply soccer, each player controls a car that must drive around and hit the ball in a variety of ways to score on the opponent. Using different methods like boost (allows players to go faster), aerials (jumping off the ground, using boost, to hit the ball while it is airborne), and many other methods, the objective of the game is to score goals on your opponent. In Rocket League, there is a "ranked" game mode that allows competitive players to rank themselves on a ladder of a variety of ranks. These ranks include (from worst players to best players) Bronze, Silver, Gold, Platinum, Diamond, Champion, Grand Champion, and Supersonic Legend. Each of these ranks further divide into divisions (1-4), and players can improve their divisions and ranks by winning games (and derank by losing games). This website is not only something that we will enjoy using, as we plan on including statistics that are fun to see and important to know, but also will give people outside of this class a resource to visualize their own Rocket League statistics.

Project Objectives

With the background provided in the previous section, there are plenty of questions that our project and visualizations are aiming to solve.

- What is a given player's boost use during the game?
- What is a given player's boost grabs during a match?
- How do x amount of players' statistics compare to each other?
- What was an individual's positioning during a match (using heatmaps)?
- What are the movement statistics for a player in a given game?
- How do *my* statistics compare to the average player in any given rank?
- Etc.

From this project, we would like to learn many different statistics, from individual player statistics from any rank, how our statistics compare to others, as well as a deeper look into our statistics for any of our own replays. Because of this, we would like to accomplish visualizations

that are customized to display information that relates to each of the questions above to allow us and anyone else to have a deeper understanding of their game statistics.

Data

In order to gather the data for our project, we needed a website that includes information about any individual game as well as a good and easy way to parse the data so we can easily visualize it. After some researching, the best website/API we found was on a website https://ballchasing.com/. This website includes the ability for anyone to scrape data about user replays with tons of information about the game, but also the ability to upload their replay for the website to process and turn into data to then scrape. This will be extremely useful to allow users to customize the data and visualizations to their own replays as well as getting data from all kinds of players from a wide variety of ranks.

Data Processing

From researching the API by ballchasing.com, there does not seem to be a lot of data cleanup required. It includes a wide variety of fields and sets of data that will allow us to have many charts and graphs without being given many unnecessary fields. Quantities like boost data, position data, player data, and match data are fields that we plan on incorporating into our project. These fields include many subfields, for example for any player that was in the game, we can get the following data only about their positioning:

"avg_distance_to_ball": 2865,
"avg_distance_to_ball_possession": 2833,
"avg_distance_to_ball_no_possession": 2893,
"avg_distance_to_mates": 3567,
"time_defensive_third": 193.27,
"time_neutral_third": 122.94,
"time_offensive_third": 77.34,
"time_defensive_half": 265.87,
"time_offensive_half": 127.68,
"time_behind_ball": 314.43,
"time_infront_ball": 79.11,

"time_most_back": 143.9,
"time_most_forward": 110.8,
"time_closest_to_ball": 119,
"time_farthest_from_ball": 136.4,
"percent_defensive_third": 49.10939,
"percent_offensive_third": 19.651886,
"percent_neutral_third": 31.238726,
"percent_defensive_half": 67.556854,
"percent_offensive_half": 32.443146,
"percent_behind_ball": 79.89786,
"percent_infront_ball": 20.10215,
"percent_most_back": 37.603218,
"percent_most_forward": 28.953695,
"percent_closest_to_ball": 31.096478,
"percent_farthest_from_ball": 35.643356

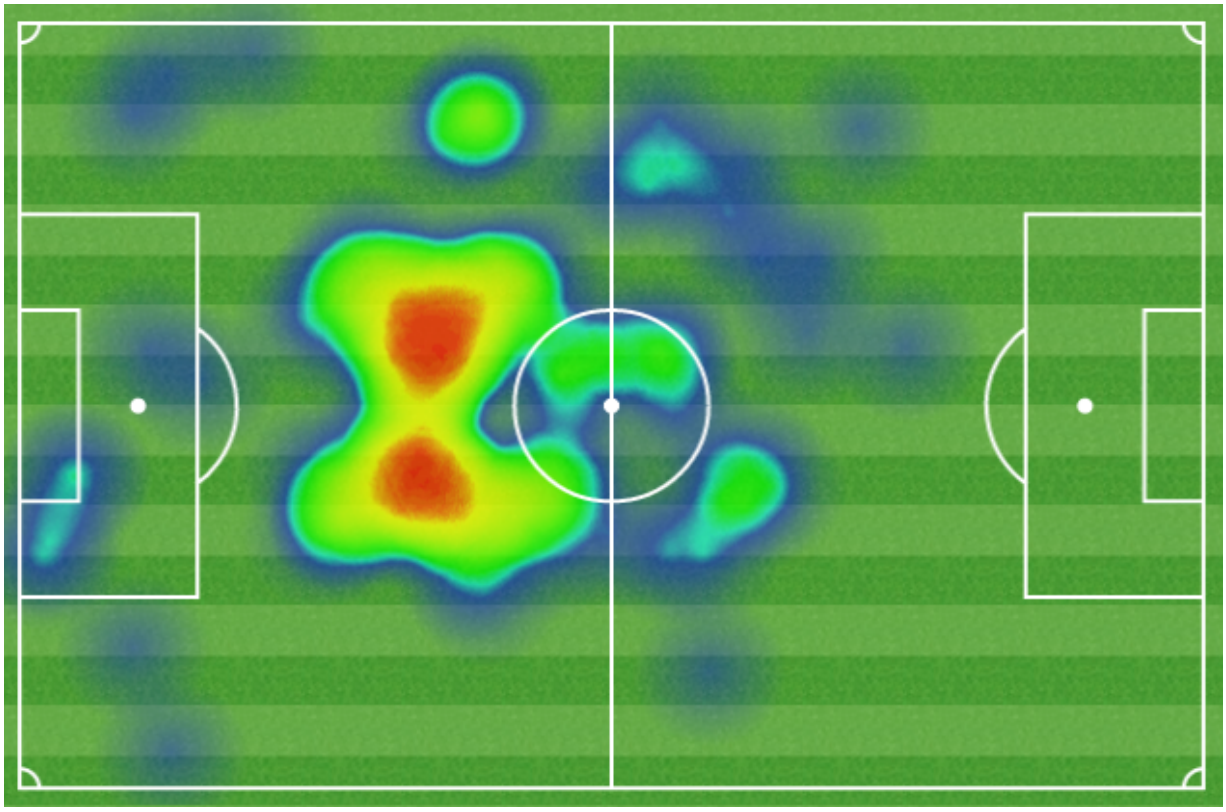
This is *only* data for one player's positioning, and each different attribute about a game has this amount of data (or more) for them, meaning there is plenty of data to create visualizations for. For data processing, we plan to first scrape a bunch of data off of the API (rate limitations prevent us from getting more than 2 requests/second, up to 500/hour), then saving the data we scrape in different csvs we can then parse from, and use the fields we want to visualize through objects that contain all of the information about a certain statistic.

Visualization Design

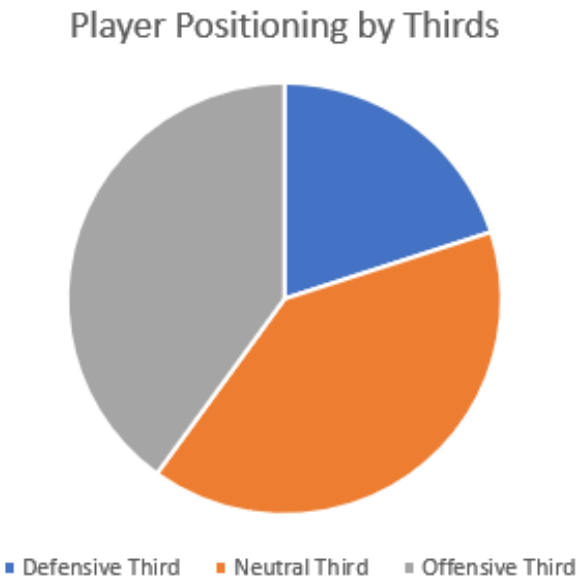
To display our data, we plan to have a variety of charts, graphs, and maps that display different statistics about different parts of a game. A few different statistics we plan to have visualizations for are player positioning, player statistics from a game (boost, shots, movement, demolitions, etc.), and list of player statistics (goals, saves, shots, etc.). Since there is a large database of statistics, all of our visualization could have rank averages and comparisons as well as just individual statistics. Below you can see some example sketches of the data we intend to visualize.

Sketches

- Field positioning visualization (defensive vs offensive half)

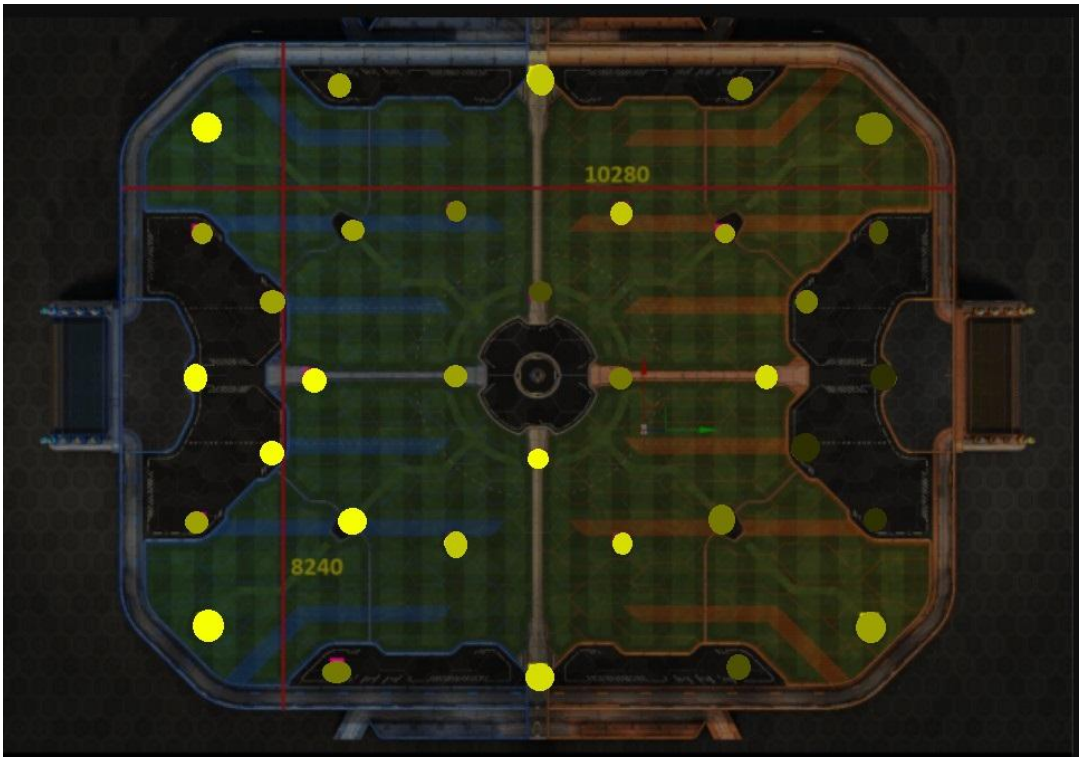


  - A visualization that allows players to understand where they are most commonly placed around the field during a match would greatly benefit those who want to use previous matches to improve themselves. Heat maps are generally the best visualization for positioning as it shows where players are most commonly found during a game, allowing them to understand where they were and how they can improve their positioning.

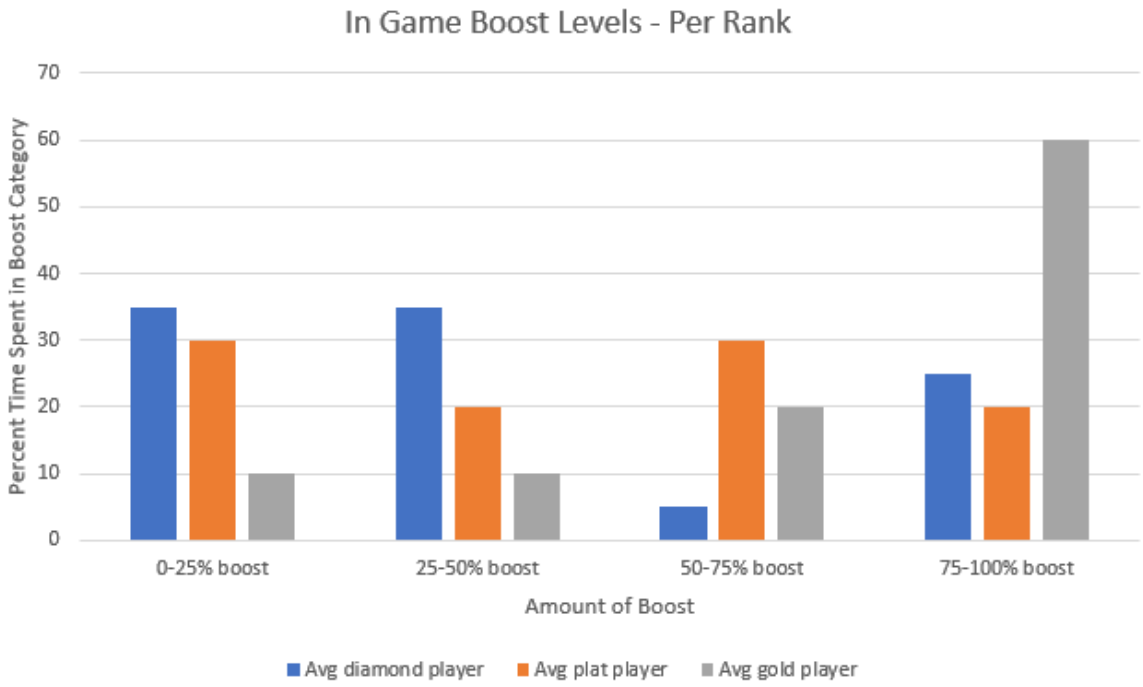


- As each game replay allows you to track how long you were in different parts of the field (first, second, last third of the field), allowing players to easily see which role they played during a match can better help them understand their playstyle. A simple pie chart allows the user to understand which third they were in, and compare it to each of the others.

- Boost statistics (which boost, avg boost amount, etc)

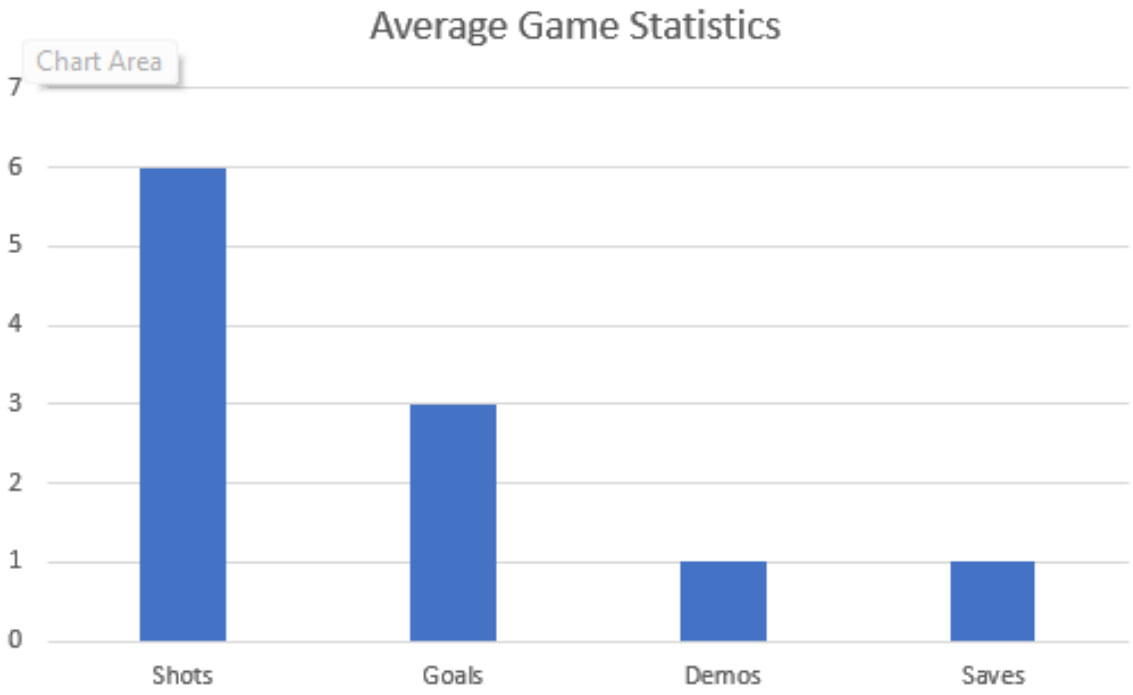


- The picture above is a top-down view of the field in Rocket League, as well as yellow dots to signify boost pads where players can get more boost. This visualizer immediately gives the user a good grasp on where on the field boosts are, and as we plan on making circles larger/smaller based on how many times they grabbed a boost, where they were on the field and how many times they grabbed boost in a certain area.

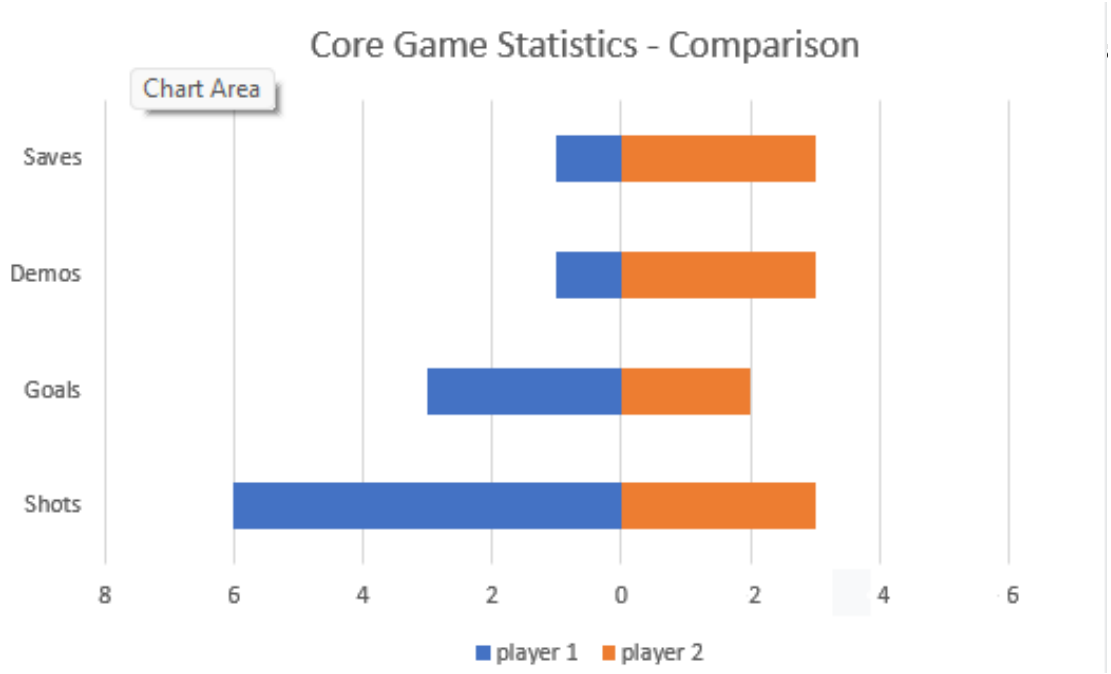


- The graph above gives a brief overview on how long a player had percentages of maximum boost. A bar graph allows us to split the sections into 4 different areas, 0-25%, 25-50%, 50-75%, and 75-100% boost. With each of these sections, the bar chart will easily allow us to show the user how their score compares to each other player in a game as well as the average for a certain rank.

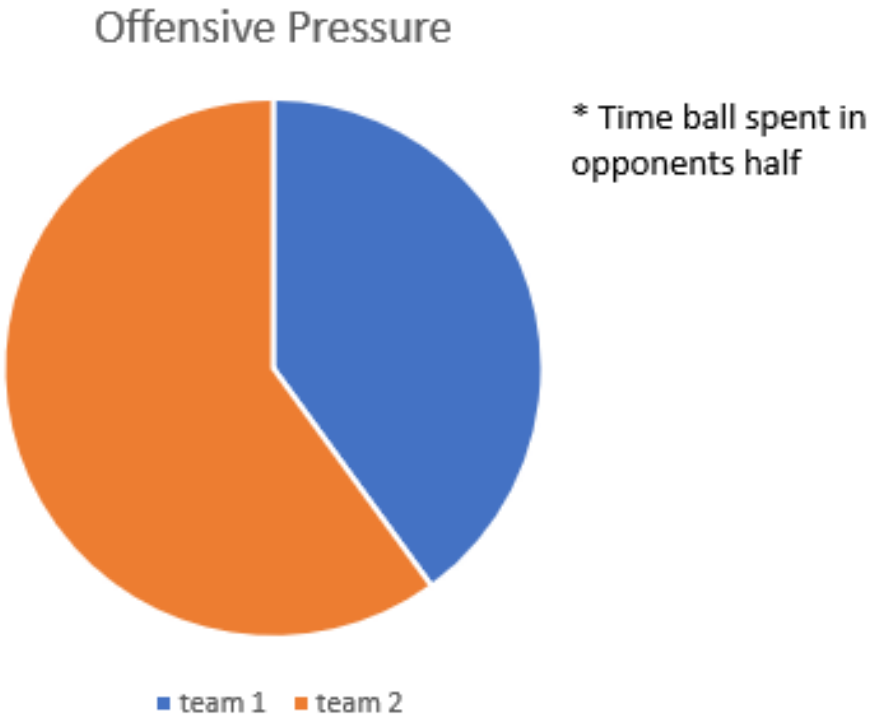
- Core stats (shots, goals, saves)



  - The graph above shows a basic representation of the core statistics in a Rocket League game: shots on goal, goals scored, and saves made. These are represented in a basic bar graph as it allows the user to quickly understand the number of shots, goals, etc. they had during a match.



- Offensive pressure



    - The pie chart above represents the pressure each team in a game had (i.e. how long each team spent in the other teams half). The pie chart easily allows a user to see (without strict numbers that may be confusing) how much pressure a team had during a game.

Must-Have Features

The list of "must-haves" include visualizations that allow the user to visualize information about a variety of games we scrape from the API. These visualizations would include most of the data described earlier, and would allow the user to see statistics for any of the games we scrape from the API. These games would not allow the user to get statistics about games they have uploaded but does allow the user to get important information about any game they have played in.

Nice-To-Have Features

Features that would be “nice-to-haves” include the ability for the user to upload their replay(s) to ballchasing.com for us to then visualize the data about games the user uploads. With the information about the games, we can branch those statistics out to all types of graphs, charts, and maps we plan to create. We would also like to have visualizations that allow us to show distribution statistics for all ranks, or individual ranks if the user filters the data. These visualizations would most likely be line, scatter, or bar charts that visualize average statistics for all players.

Project Schedule

Each week, we plan to have a goal in mind that is sustainable, meaning it will be achievable for us to complete (and allow us to finish by the final project deadline), but also allow us to expand further if time permits. In turn, we will have a weekly sprint system that we will manage on Trello. These weekly deadline goals will consist of data scraping, data processing, website setup, website graphics, and finally data visualization broken down to each chart/graph/map we plan on creating.

Week 1: This week, we plan on creating and finishing an initial prototype. This will have a few different areas, from the creation of the process book to rough sketches of the page layout to implementing the first starter tables and charts.