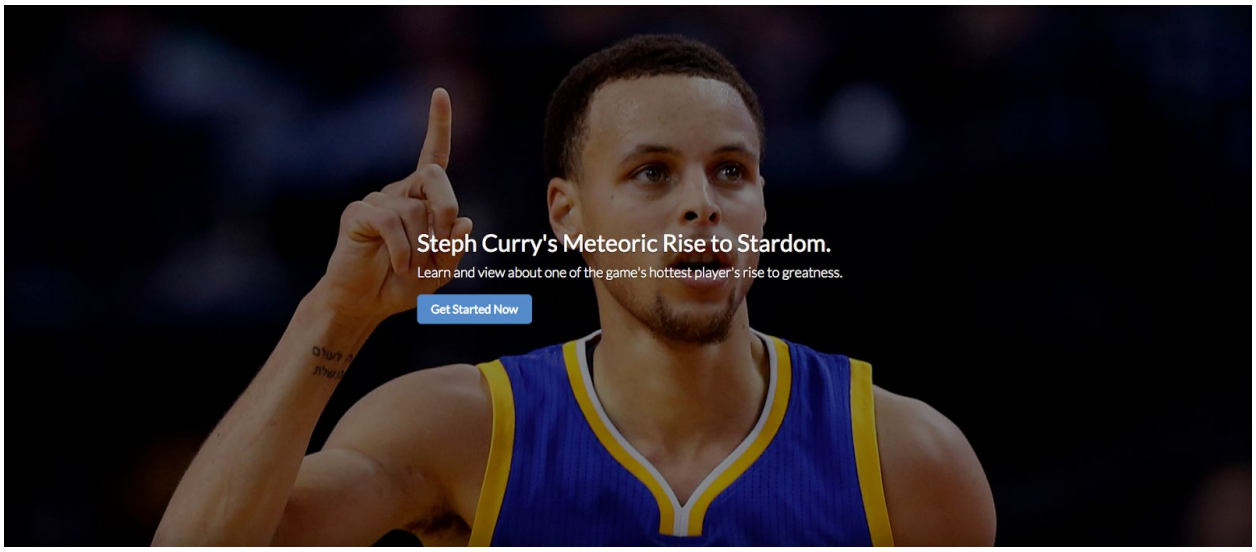
The Meteoric Rise of Stephen Curry

A CS171 Process Book by Jason Cui and Annie Hwang



Screen grab of project homepage.

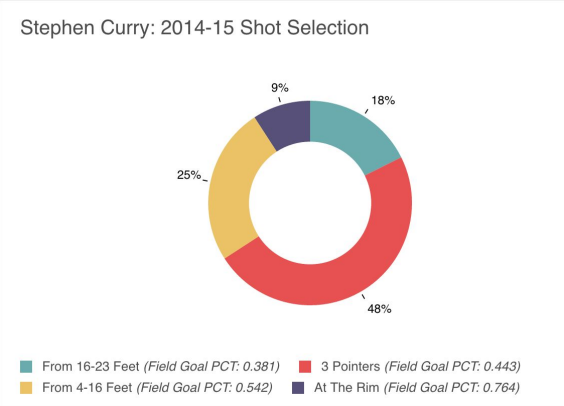
Overview and Motivation

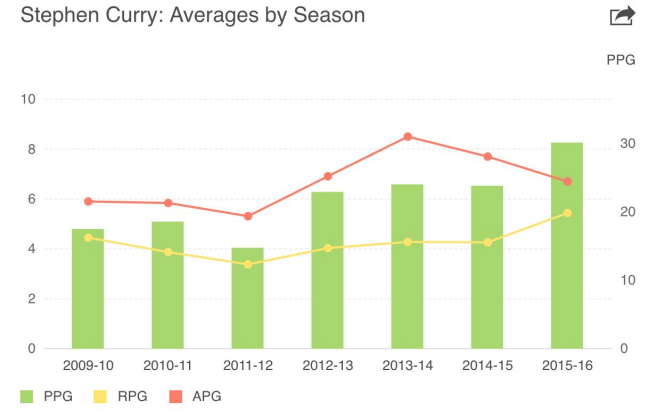
Overview:
Our interactive website describes NBA Player Stephen Curry's basketball stats starting from college until his career now. The visualizations focus on data related to Stephen Curry's this year's as well as previous years' stats (i.e. 3 point percentages, assists, rebounds, etc). The project shows other information regarding Stephen Curry (i.e. the rise in his salary level over the course of his career). The interactive visualizations will also aim to show an overview of Stephen Curry's stats compared to those of other NBA players/averages.

The Team:
We, Jason Cui and Annie Hwang, are absolutely intrigued by Stephen Curry's meteoric rise of Stephen Curry in his recent years. Throughout our years of following Stephen Curry, we have faced many friends who were doubtful of Stephen Curry's greatness. This project is thus dedicated to showcasing and proving Stephen Curry's brilliance and rise.

Related Work

Our website structure was motivated by many visualizations on the web on the rapid rise of Stephen Curry in the NBA. Many websites, like this one, try to break down Stephen Curry's progression and improvement throughout the years. There were also some shot charts on other NBA players that we tried to model our shot chart for. We were also motivated by visualizations from this link that showed that there is sufficient data out there to create a detailed shot chart and other in depth analysis of Stephen Curry's stats.





Questions

Our interactive website describes NBA Player Stephen Curry's basketball stats starting from college until his career now. The visualizations focus on data related to Stephen Curry's this year's as well as previous years' stats (i.e. 3 point percentages, assists, rebounds, etc). Along these, our visualizations aimed to answer these three main questions:

#1: How good was Stephen Curry in college?
The *College Career* section is dedicated specifically to show a detailed analysis of Stephen Curry's awards and records in college. As our pie charts show, his three point shooting, field goal, and free throw percentages were 41.2%, 46.7%, and 87.6% respectively. This is high above the average shooting percentages of other college players. The tree chart shows the many rewards he received in college as well as his impressive records.

#2: How big is his contribution to the Warriors?
To address these questions, our team implemented the main interactive pie charts under the *Warriors* section to show the exact stats distribution of all six aspects of

points, assists, steals, blocks, rebounds, and turnovers. The tooltip on the pie chart shows the detailed stats for each player of each team.

#3: So how well (*exactly*) does Stephen Curry shoot?
The detailed breakdown of Stephen Curry's percentages could be seen through the bar charts of his shooting performance compared to those of other NBA players. In the 2015-2016 season, Curry was the first in three points, free throw percentage, and average points per game.

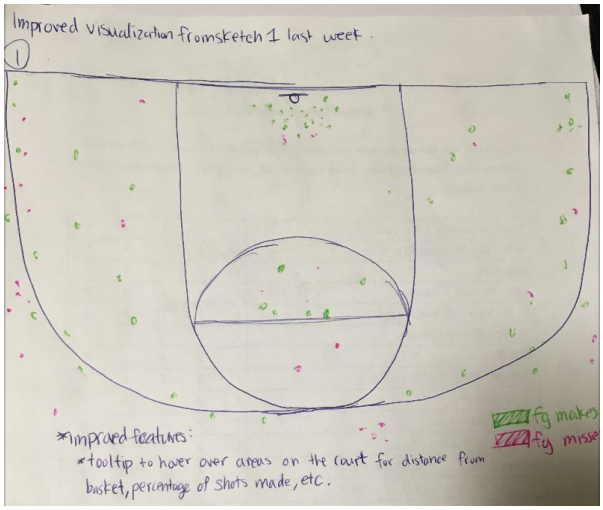
Data

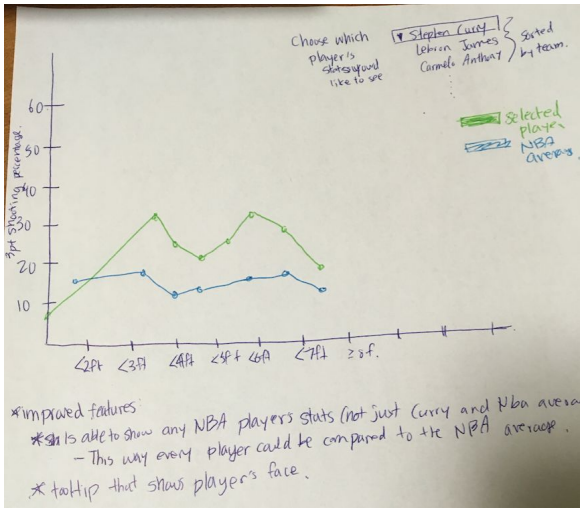
For most of the data, we were able to retrieve the stats from these links: http://www.sports-reference.com/cbb/players/stephen-curry-1.html, http://www.basketball-reference.com/players/c/curryst01.html and export it as a CSV files. Like any other labs and homework assignments, our project aimed to create interactive visualization with graphs, charts, and other more interesting representations that may be more specific to basketball. From these websites, we will be able to gather data for his 3 point percentages, assists, rebounds, etc. We were able to find data from Curry's college career at the same locations.

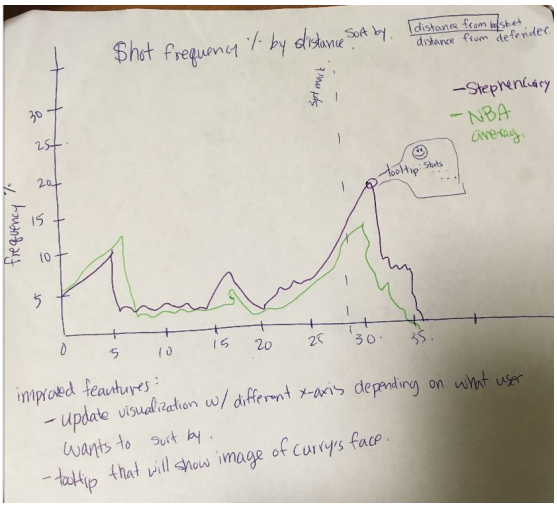
For the visualizations in the *Warriors* section, most of the data was found simply on ESPN and the NBA website (link). To create the pie charts for the stats breakdown for each time, we stored all the stats for the top 15 players of each NBA team in the *players.csv* file.
For the more detailed data (i.e. exact distance and location of shooting), we were able to use the NBA stats API that returned a json data structure of any player given the player ID, season years, and other relevant information for shot charts. The external json data could be found on this link. This shows Stephen Curry's detailed shot details for the 2015-2016 season.

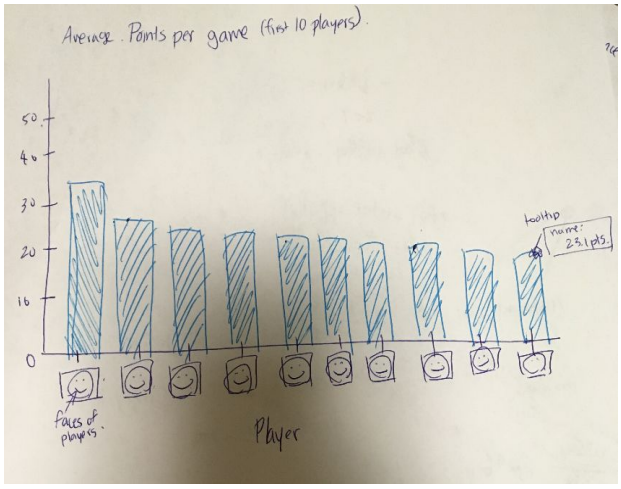
Design Evolution and Implementation

Design:









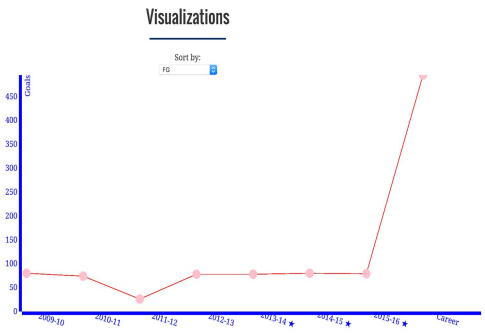
Our design sketches tried to address all the questions we tried to answer. While we were sketching, we constantly thought of ways on how to make the visualization more interactive and informative to the user. With these sketches, we dived into our initial implementation.

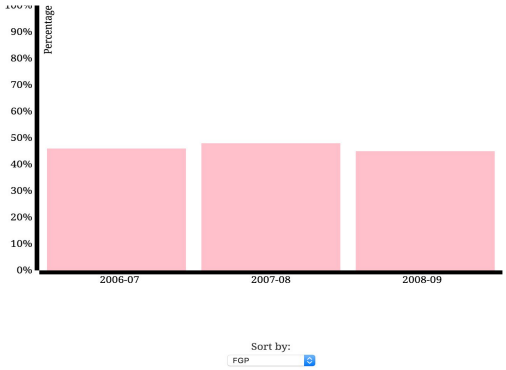
Initial Implementation

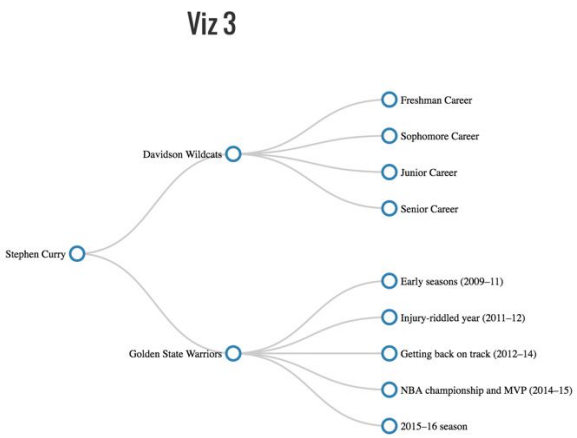
For the first prototype of the project, we created four d3 visualizations using the visualization techniques we have learned in class. These are the four visualizations:

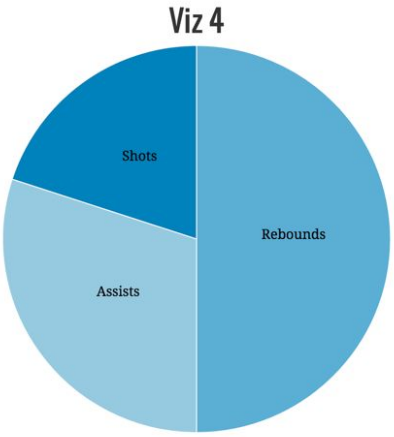
1. Interactive line graph visualization with a tooltip that shows the data for Stephen Curry's Field Goals, 3PT Shooting Percentage, etc. The visualization allows user to choose which data to focus on and hover over points to see more detailed information on his stats.
2. Interactive bar graph with a tooltip that showcases Stephen Curry's college career. The visualization allows user to choose which data to focus on and hover over points to see more detailed information on his stats.

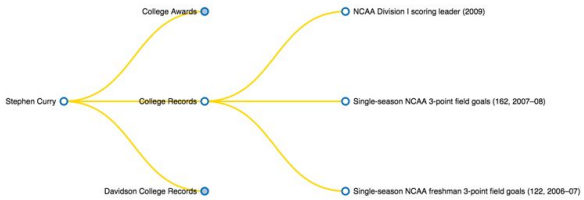
3. Interactive tree graph that breaks down Steph Curry's career. This lets us see Steph's career over college and in the NBA.
4. An interactive pie chart that details Steph's shots, rebounds, and assists.





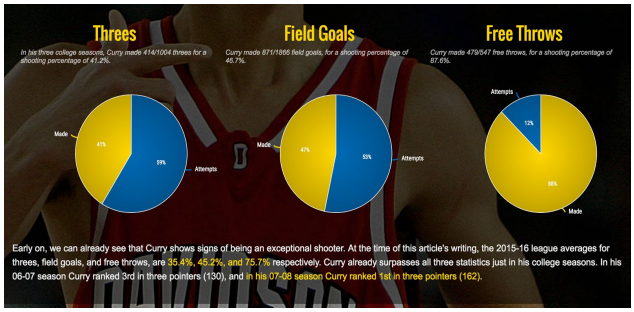


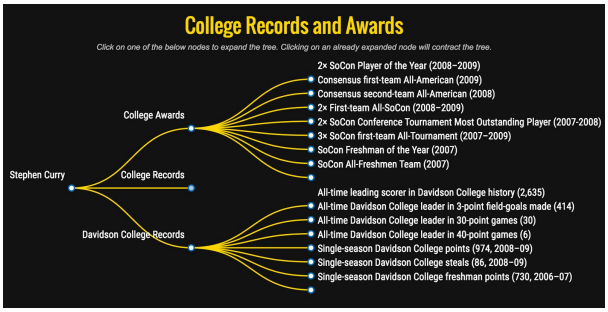




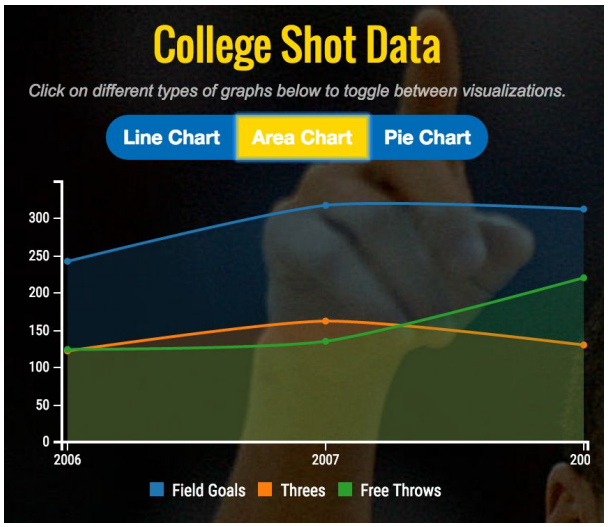
Final Implementation:
The final structure of our website is divided into Stephen Curry's college career and his current career with the Warriors. Below is a more detailed outline of the data, our motivation, and how we used what we learned in this class to visualize our data.

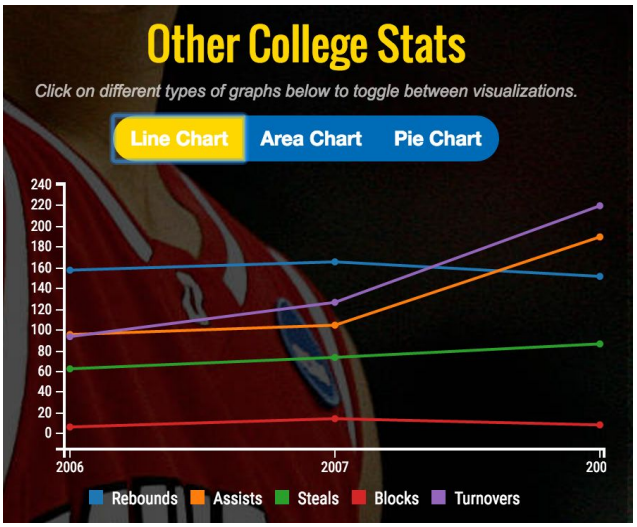
College Career





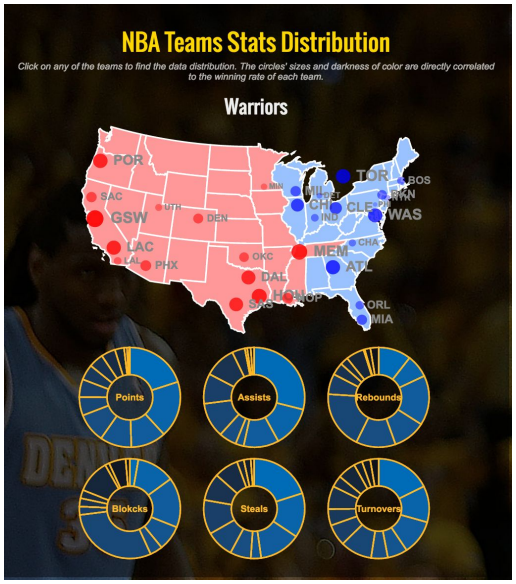
Detailed pie chart and tree of Curry's college shot percentages and record.

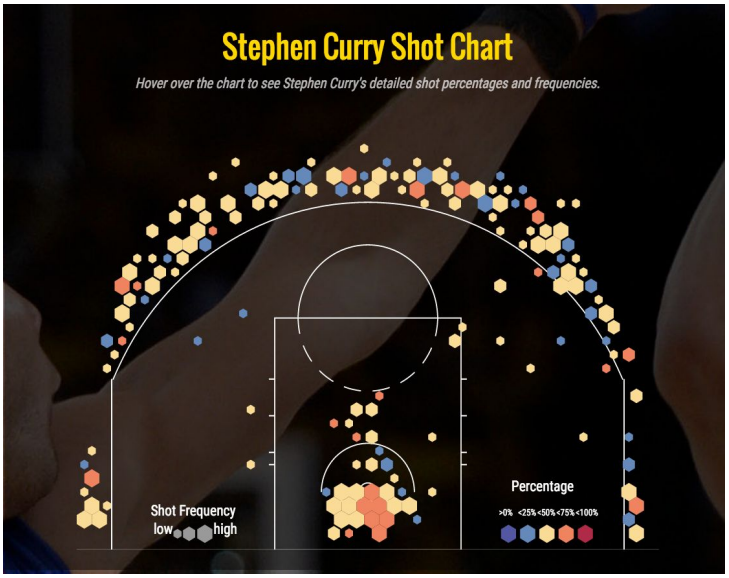




Detailed line, area, and pie chart of other college stats.

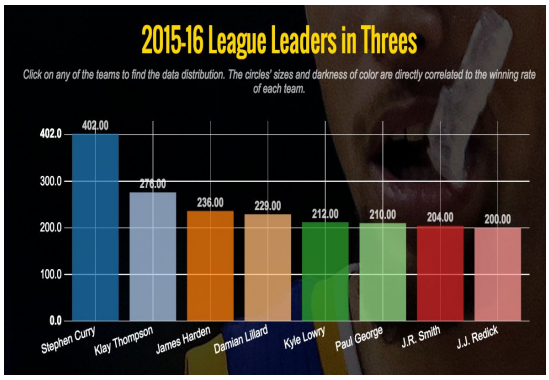
Warriors

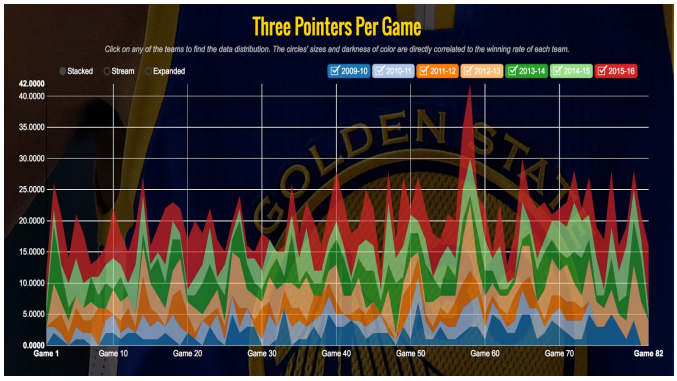




Donut pie chart of stats distribution for each team and Stephen Curry shot chart.

NBA Team Stats Distribution: This visualization was implemented using the geojson we have used in many of our homeworks and labs. All of the detailed information could be found in the *warriors-map-pie.js* file. We stored all the teams data in the *NBA-teams.csv* file, and all the more detailed player stats in *players.csv* (all of which was downloaded from the NBA website that allows anyone to download the stats in csv form). The team colors are represented in the *NBA-teams.csv* file under *lightColor* and *darkColor* in order to be used to change the color for the pie charts according to which team was chosen. The pie chart shows the distribution of the stats from each player on a team on average.
Stephen Curry Shot Chart: The shot chart was created using the data from this link that has a json formatted data structure of Stephen Curry's shot locations and percentages. The *d3-basketball-shot-chart.js* first creates the basketball court using lines and arcs just as we have during class, and creates hexagons with different colors and sizes depending on their shot frequency and efficiency. The implementation uses *d3.nest* and *rollup* to group the shots data, which originally has a size of 1596 entries. Using these two features allows us to group the shots into regions, rather than plotting all 1596 shots. The color of the shots are determined by the legend that simply uses the *heatScale: d3.scale.quantile()*
in order to categorize the percentages into 5 different colors. For this function, though the domain shows that *.domain([-2.5, 2.5])* for the *z* value, this is actually just the percentage of makes/attempts. Thus it is safe to assume that the percentages are categorized into >0%, <25%, <50%, <75%, and <100%.





Evaluation

Video