Process Book

Yanran Ma, carriema
Qianchao Nie, nieqianchao
Shjie Jiang, jiangshijie

Overview and Motivation

In this project, we hope to visualize the NBA dataset. We want to see the performance of one team and the performance comparison between two teams. For each team, we want to see the performance during the whole season and the overall statistic in the key metrics. For two team comparison, we want to know the strength of each team, the performance of all players in one game and hit rate and score structure for one game.

Related Work

Our idea come from http://stats.nba.com/. It is just display the data on the website. It is hard for user to get the information they want. So we hope our project can help user interpret the data better.

Questions:

At the very beginning, we try to answer too many questions, this make it hard to find the focus of our visualization. After talked with Prof. Lane, we decide focus our point on the team level data. That is, for each coming game, one could find out the history of these two teams, compare their performance, check the overall index of each team in every game. After the demo feedback, we add more information for single team, its game history, players' performance etc., as well as more comparison of two teams.

Data:

We get our data form API of http://stats.nba.com/ by using python request library. The data is already formalized, so we didn't do too much cleanup. After scraped from the website, the data is saved as csv file for our project. We use some outside data source about detail information of the team, such as team location and team winning rate.

Exploratory Data Analysis:

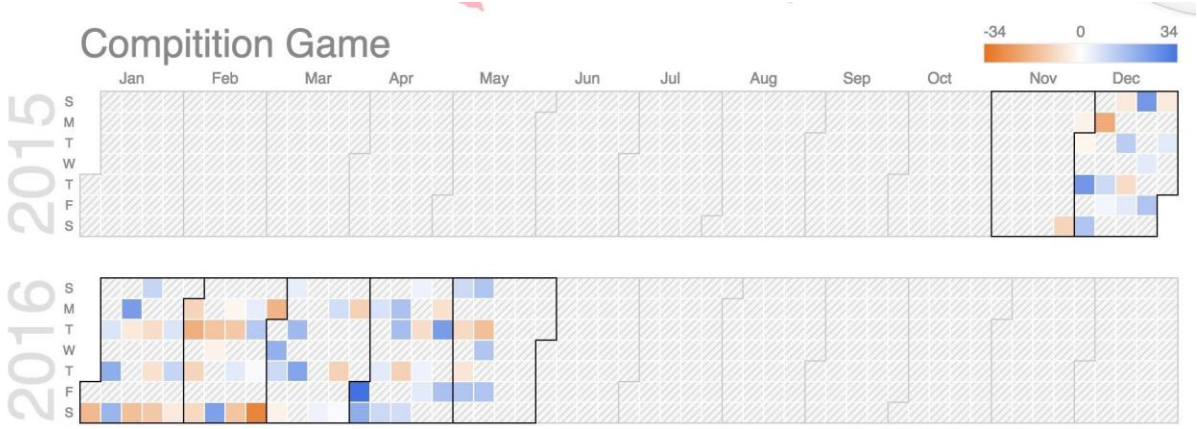
We used map, radar chart, bubble chart, and bar chart etc. All these visualization methods are extract from our script. We tried to tell the story in a cognitive way, that is, each visualization fits the idea of the users and show the information properly. Follow this, we use map to help people choose the teams, get a brief idea of their performance, then they could drill into each game to see the details.

Design Evolution:

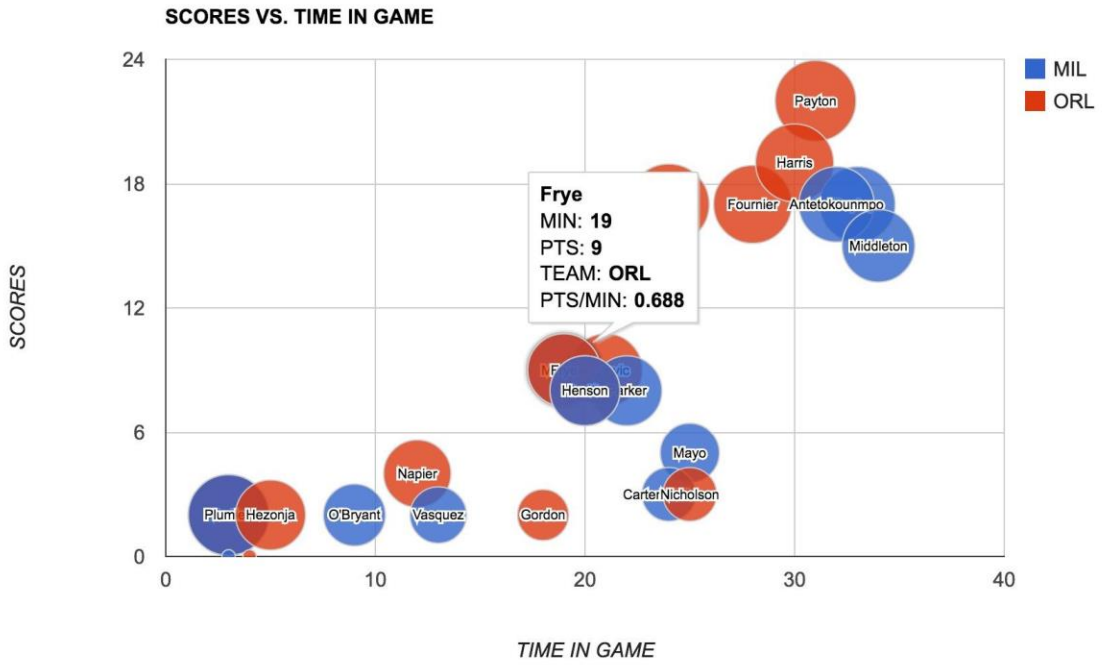
For team selection visualization part, at first we would like to add some check boxes under one view, and people can choose teams via check boxes to compare performance between two teams. Now we transfer from check boxes to a US map, each team located in its actual city. And we split all teams into east part and west part with different colors and it gives people more perceptual intuition, which we learned from the class.
In addition, at the very beginning, we were considering use bar chart to compare game score. Now we change to slope chart as we learn from class slope chart is more suitable in this situation.

Changes after Demo Feedback:

First, we created a game calendar for a single team, so one could find all the game history of selected team. The blue box indicate the team win the game on that date, the red indicate lose. And the darkness of blue and red shows score difference of win or loss.

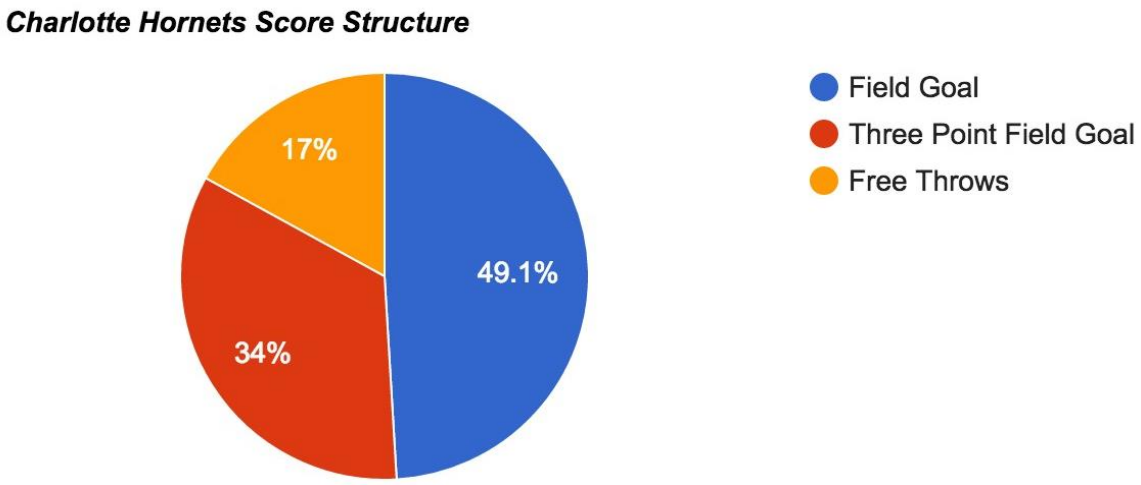


In addition, once click any game in above calendar. We have a bubble chart shows the performance of each player: how long do they play in the game, how many scores do they get.



Another improvement is that we add more detail information for two teams' comparison: score structure and hit rate for different type shoot.

Below is the score structure pie chart. From this figure, we can know how many scores from Field Goal, how many from Three point and how many from Free throws.

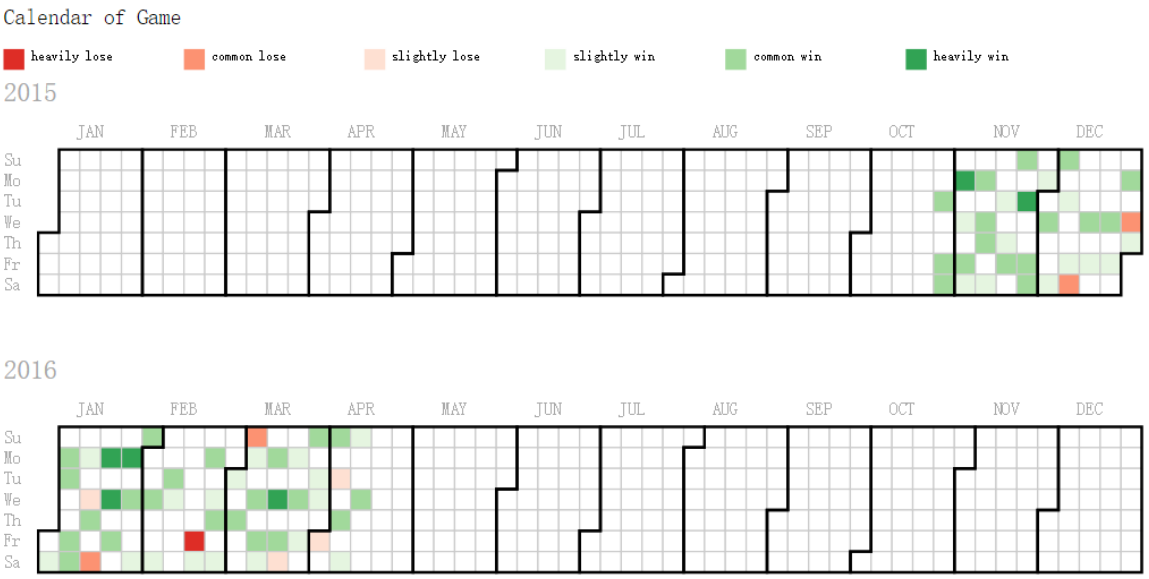


And we have some gauges to show the hit rate for each team. Below is an example that we can know the exactly hit rate for each shoot type.

Final Version:

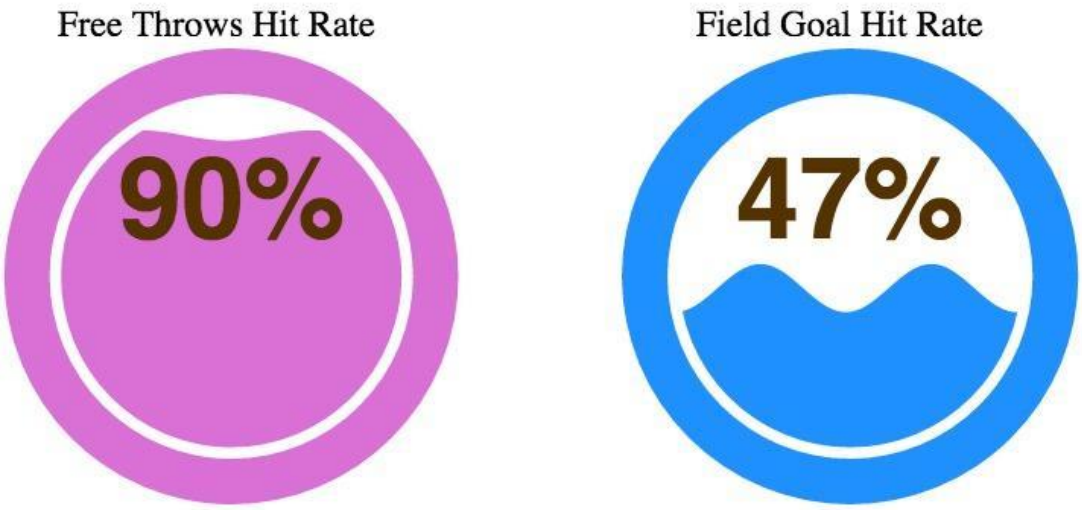
After made some modification based on feedback from our demo presentation, our project can provide more information. However, some of visualizations have some drawbacks, we modified them and got our final version.

For Game Calendar visualization showed in above section, it drawled by google chart, which has a bad default setting and we are not able to define some features by ourselves. For example, we can only define the initial and final color but unable to choose color between them. And we cannot define categories about the score difference. Therefore, in final version, we change this game calendar visualization from google chart to d3.js to support more self-defined features.

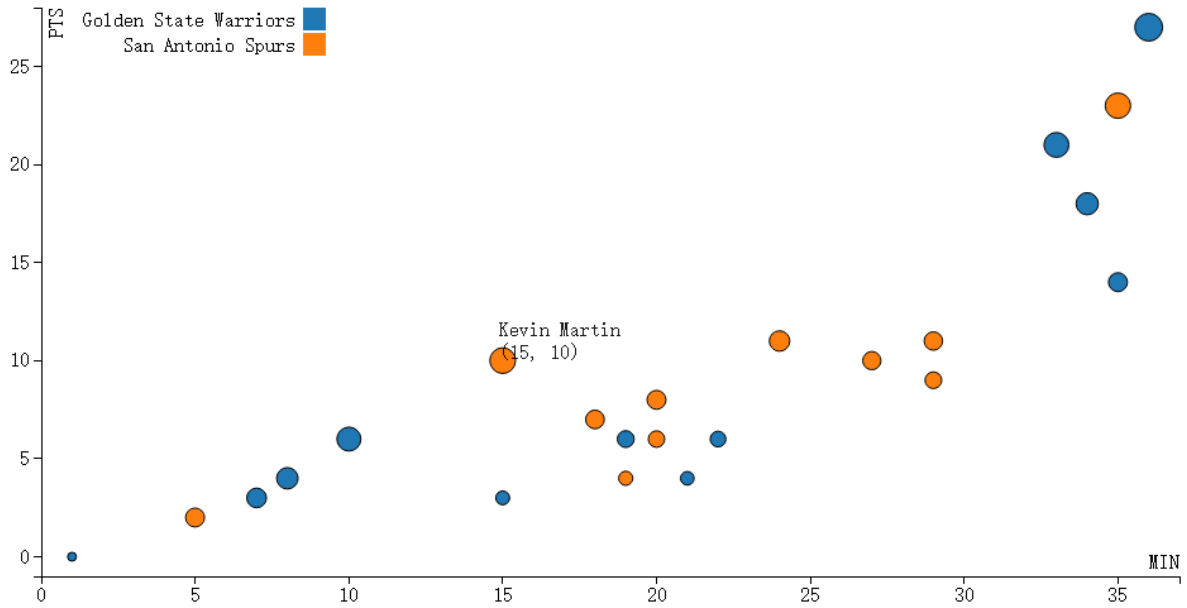


For Hit Rate visualization, we change the gauge chart to wave chart because gauge is not easy to compare the hit rate between two teams when there is minor difference. In addition, every gauge has similar appearance, it not very convenient to know the gauge is belong to which team. For wave chart, we can know the exactly

hit rate from the number and we can define the different color for different team, which provide an easy way to recognize information from different teams.

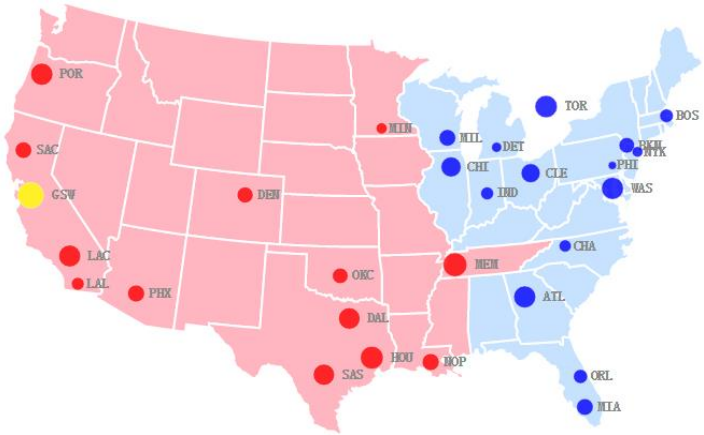


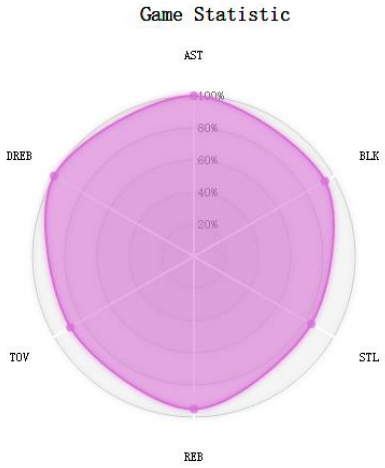
For the bubble chart visualization that shows the player's performance. We also use google chart to implement it at first, and we find it's not very easy to configure the size of each bubble and it's easy to have the overlapping problems. As it's not easy to change google charts' setting, we change this figure to D3.js.



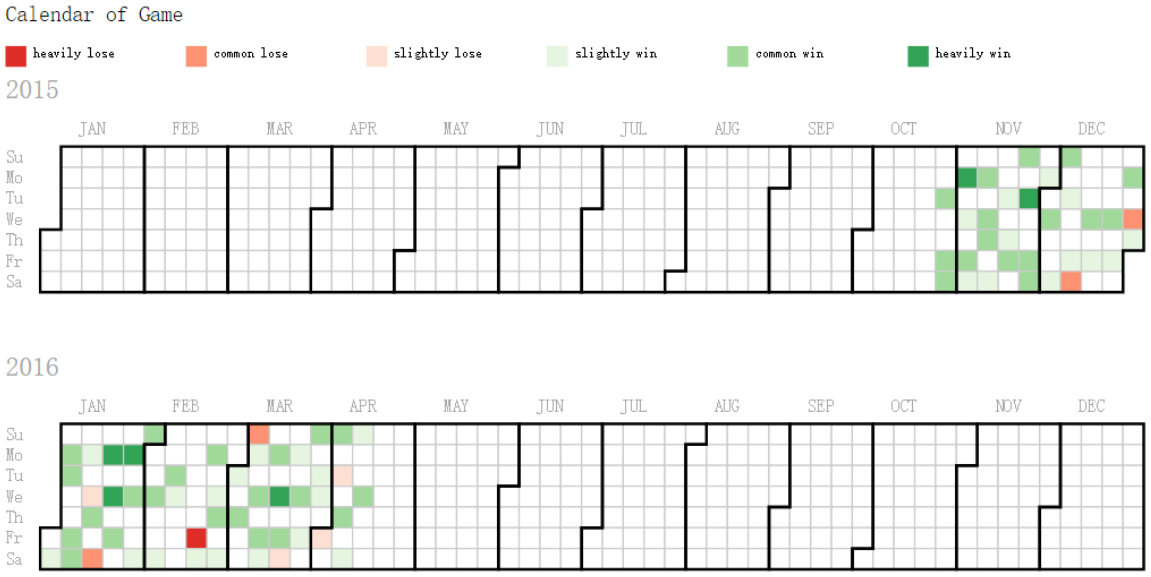
Implementation:

Firstly, our visualizations provide a US map for people to interactively select teams they would like to compare. The size of spots represents the winning rate.

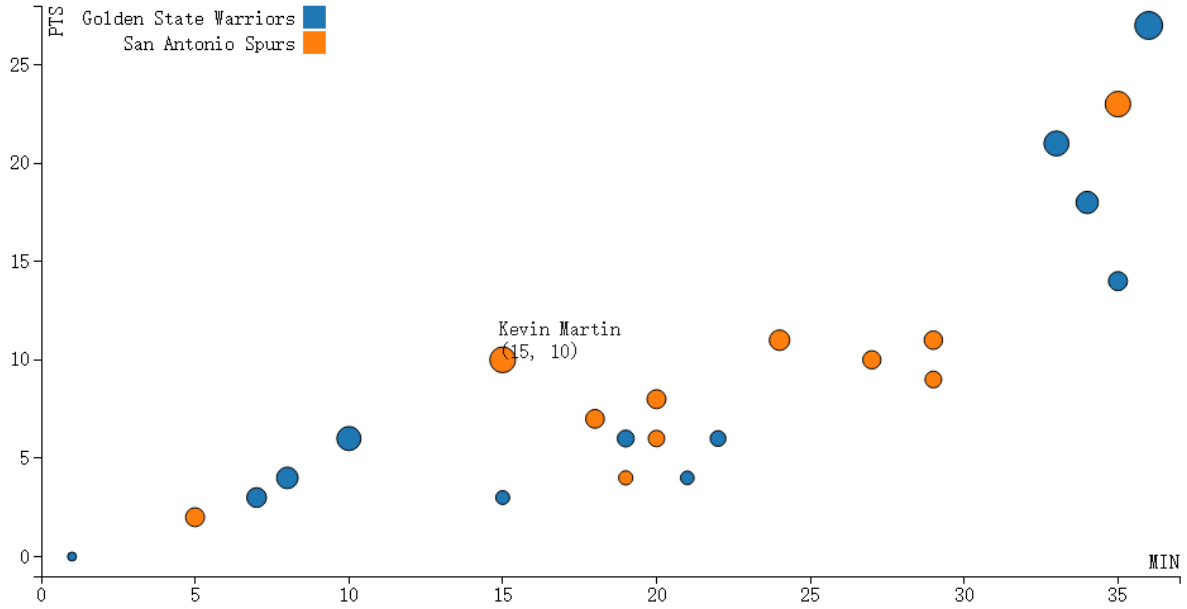




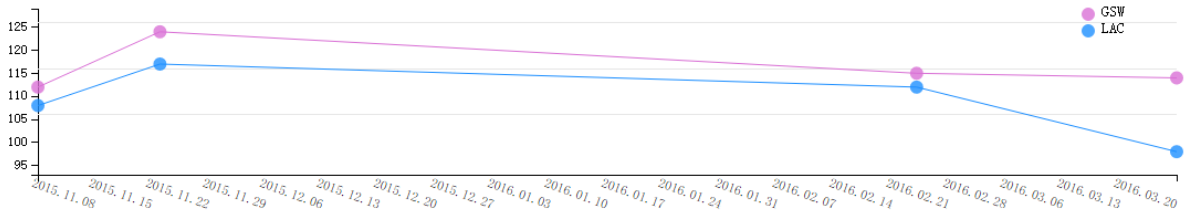
Once the users select a team, a radar chart comes out and shows the ability of this team. Also, all the games history of this team shows in the calendar below.



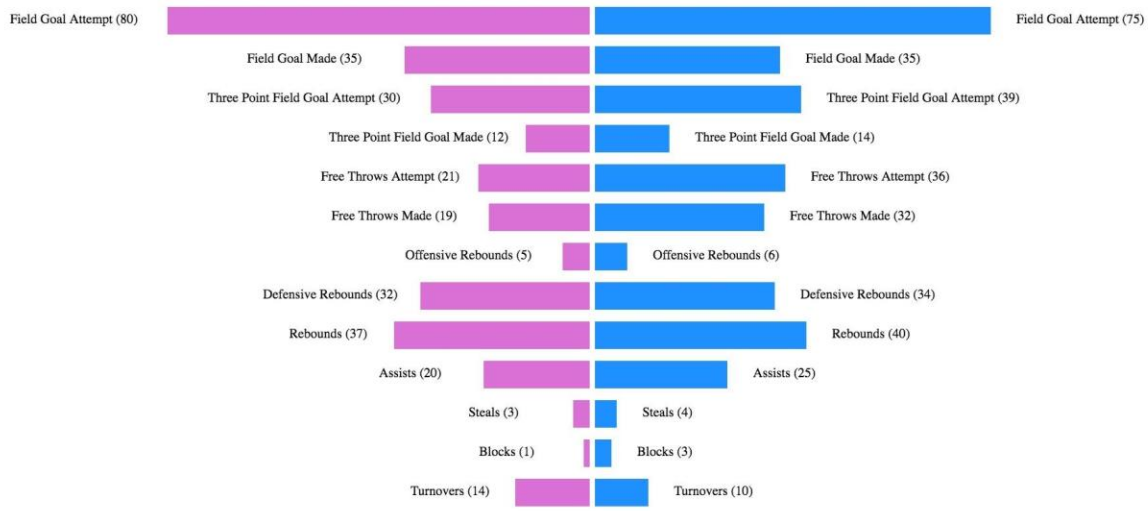
Users could tell win or lose through the color. Also, they could select one game to see the details of each player.



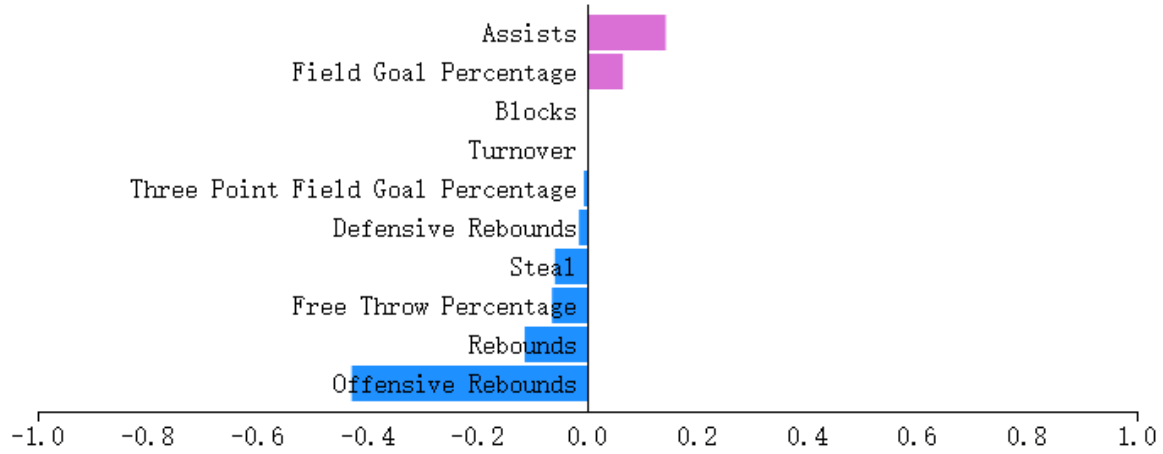
Once they select another team, the ability comparison will show as a radar chart. In addition, the scores they got from their each game competition will also show as a slope chart.



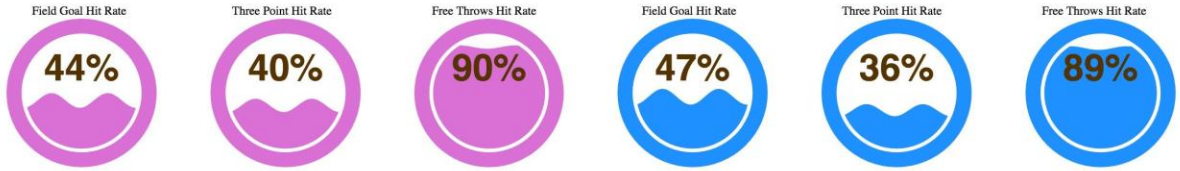
And if people would like to see all details for each game, they can move their mouse to the game point and all details will appear. And these details will be interactively change when people's mouse move to another game.

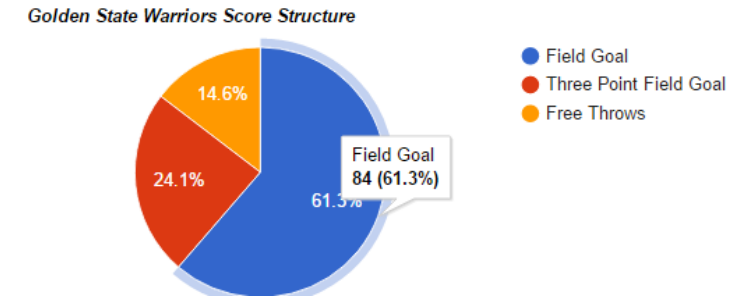


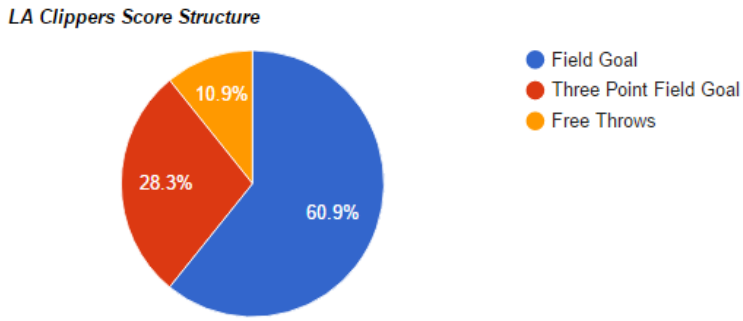
We also have percentage comparison in key metrics, so one could tell which team is good at which aspect compared to another team.



The same with single team, the players' performance is presented in bubble chart. Besides, we support more detail comparison of the two team: Hit rate and score composition.







Evaluation:

Our project focus on visualize NBA on team level as there are so many good visualization on player level. We tried to provide a good way that people can

intuitively got the information of NBA teams from our visualizations rather than mess data.

Our contribution is following:

Firstly, people can easily get the information like the physical location of each team and their key statistics for the whole season.

Secondly, people can get the all games one team played and the result from a calendar visualization and select any game to investigate further.

Thirdly, multiple datasets are included in our visualizations to provide players' performance in a game.

Fourthly, we provided a way to compare either two teams' overall performance or detail information from any game they played with each other.

Fifthly, we summarize and aggregate the dataset and use them to create visualizations to provide information like score structure and hit rate for different shoot type.

Our future work might be add more data into our visualization as right now we just include one season data.