Process Book

COM-480-DVteam

Visualizing NBA Player Shooting Data

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Introduction

The National Basketball Association (NBA) is known for its thrilling games and exceptional athletes that attract fans worldwide. As the 2023 season approaches, analyzing player data is critical for fans, analysts, and coaches alike, allowing them to clearly compare information about different players. However, the vast amount of available performance data is often raw and unprocessed, lacking systematic organization and insightful visualization. To address these challenges, we selected a dataset that includes comprehensive performance metrics for popular players such as LeBron James, James Harden, and Stephen Curry for the 2023 NBA season. The dataset provides detailed information on shot attempts, timing, distance, and scoring. We have converted this data into an interactive visualization format to get a clear picture of a player's strengths and performance.

Enhanced Data Visualization:
Create high-quality, clear, informative visualizations that effectively communicate key performance metrics such as shooting percentage, hit location, and scoring patterns.

⭐ Our Goals ⭐

User Appeal:
Ensure that visualizations are accessible and appealing to a broad audience, including NBA enthusiasts, analysts and fans, enabling them to gain a deeper understanding of player dynamics.

Interactive features:
Develop dynamic and interactive visualizations that allow users to easily explore and compare player performance data, highlight relationships and trends, and track changes through time.

Design Path

Topic

We almost immediately decided to use sports-related data for our visualization, as sports data visualization is meaningful and the related data and processing are easy to find.
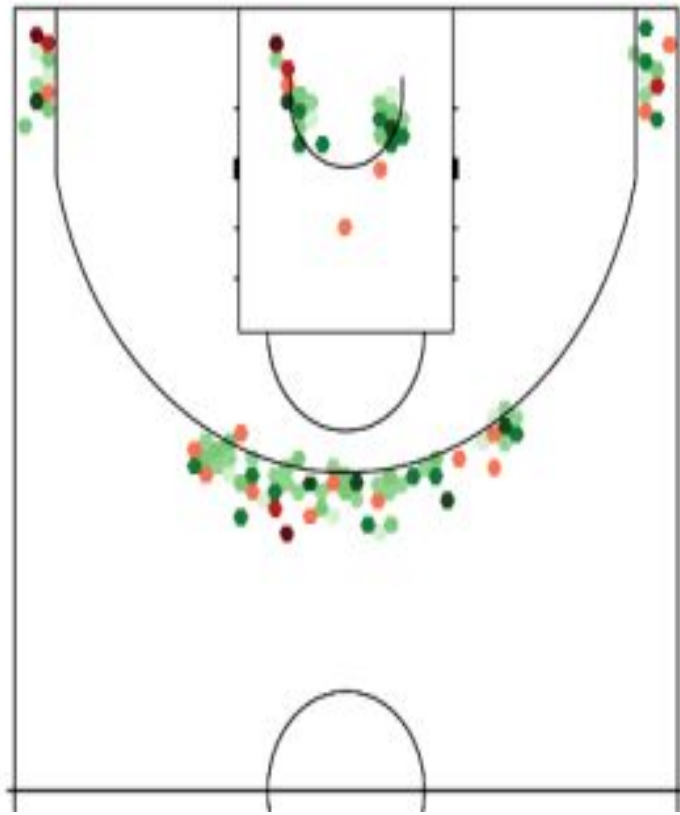
Dataset

We spent a long time discussing the specific dataset to use. The dataset needed to be meaningful for visualization and widely relatable to ensure it would be easily understood and accepted by the public. Consequently, we chose the scoring data of the three most iconic basketball players of 2023 as our subject.
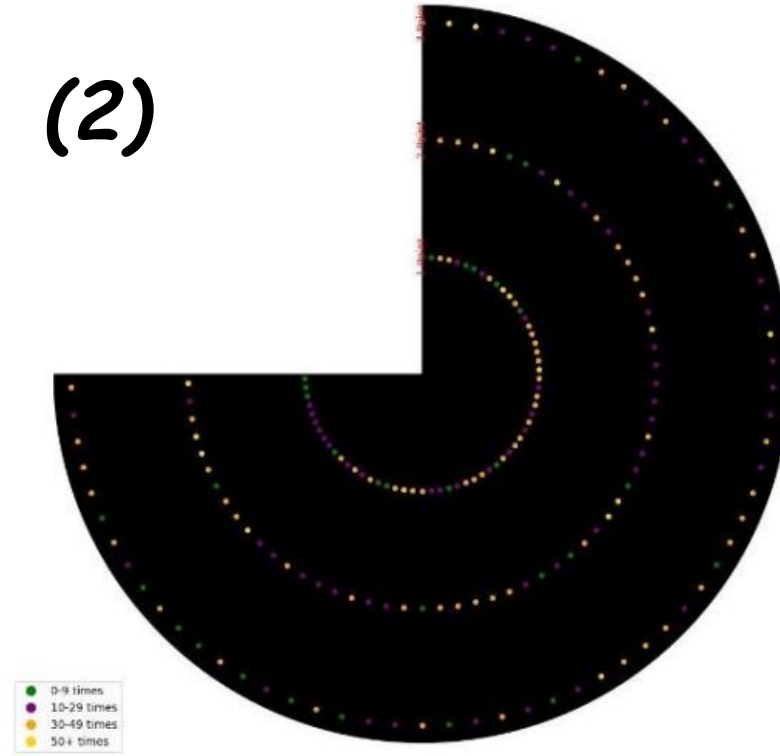
Visualization

We reviewed websites related to basketball data, borrowing and selecting visualizations and techniques that we found appealing. We then optimized these based on the characteristics of our dataset (such as changing the meaning of the axes and the significance of data points). Finally, we chose what we believe to be the best solutions as our primary visualizations, focusing on the shot locations (spatial aspect), shot timing (temporal aspect), and performance in each game throughout the season (macro aspect).
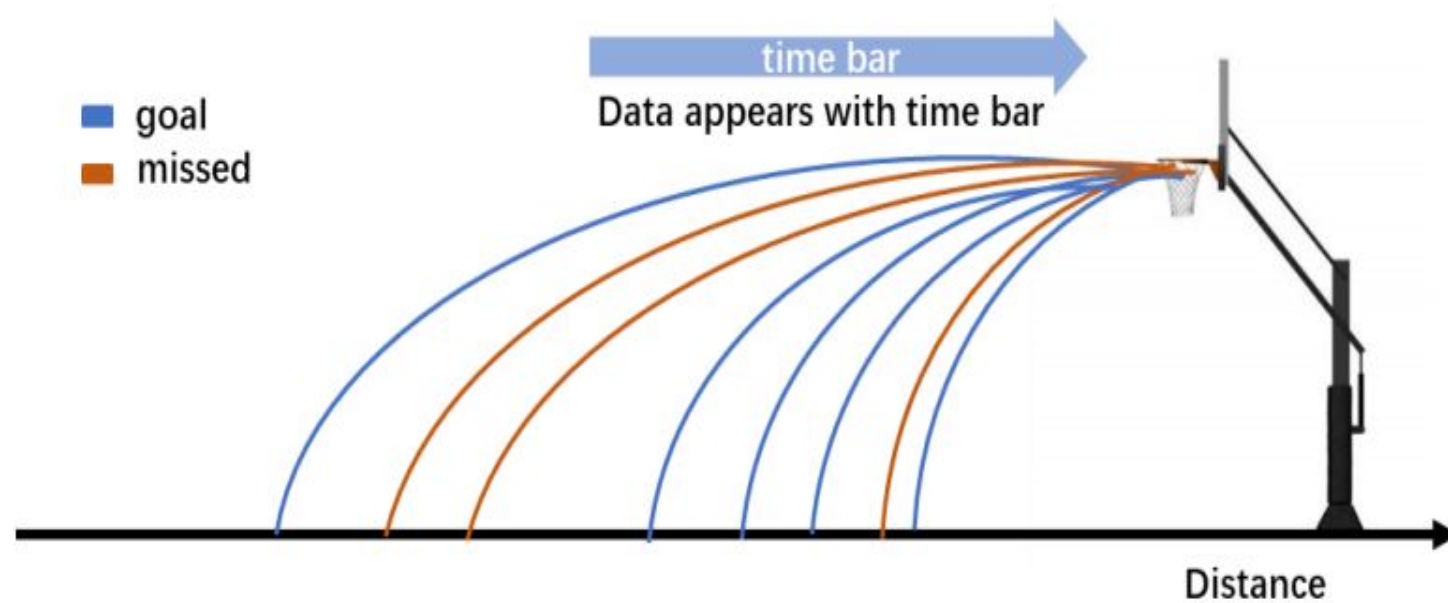
Recall the previous sketch

(1)

(2)

- 0-9 times
- 10-29 times
- 30-49 times
- 50+ times

(3)

- goal
- missed

time bar
Data appears with time bar

Distance

(1) Shot Heatmap
(2) Season Shot
    Statistics
(3) Time tracking

For details please find in
milestone2.pdf

Our Final visualization

We have successfully visualized the sketches and corresponding functionality in milestone2. We also added the function of switching players on the web page for easy comparison, and a time tracking function regarding the feedback of milesone2. Below is our final visualization.

vis-1: Court heatmap where the viewer is able to change the area of group and filter based on the result of the shots.

vis-2: Hover over the data point to get the detailed information (date & count). The data point you hover over will be highlighted to help to distinguish.

vis-3: Press start, the timebar will move (12 min normalize to 10s) and the shooting curve will appear related to the normalized corresponding time points. Blue is goal and red is miss.

For more information, don't hesitate to check out the website! (Link to the website)

Design of visualization 1: Shot Heatmap

Inspiration:

The basketball court is one of the most recognizable courts in sports. Where the importance of where the shot is made reflect the number of points given to the team in case of a succes shot. Therefore where better to visualize players performance that other than the court.

Main Challenge:

The main challenge to create the visualization is be able to group by the shots and get a sense in which position the player perform better.

Design decision:

To address the challenge, the principal design decision relies on the hexagon chosen to group in small but representative zones on the court. Tessellate the court with hexagons allows us to rescale them for a different analysis.

Design of visualization 2: Season Shot Statistics

Inspiration

By The shot charts for basketball players provide a detailed view of their shooting performance throughout the season. By analyzing the amounts of their shots throughout time, we can gain valuable insights into their tendencies on the court.

Main Challenge

The main challenge in creating this visualization is accurately representing the volume and distribution of successful shots over the season. Additionally, ensuring the visualization is interactive and provides detailed insights into specific games and shooting performance adds to the complexity.

Design decision

We created a radial shot chart to visualize shooting performance over time. Each point represents a successful shot, with color coding and size variations to show the type and volume of shots. Interactive tooltips help viewers explore the data.

Design of visualization 3 :Time tracking

Inspiration:

Inspired by the parabola of an athlete's shot into the basket, it is desired to visualize the shoot data from the side of the basketball court. Also we want to introduce a time variable and an accuracy variable. In this way, viewing one visualization is like observing all of the athletes' game shots for the year 2023 at the same time.

Main Challenge:

During the visualization process, the raw data table has both "Ture" and 'TURE" to indicate whether a goal was scored or not, JavaScript couldn't tell the difference, and LeBron James didn't score a single goal... Also how to make compatible overview of multiply data is a challenge.

Design decision:

This section visualizes NBA players' shooting statistics versus time. Time bar represents the NBA one quarter, which is 12 minutes. And the accuracy of shooting is displayed by different color. The shooting line transparency is decided to be 0.1 to better view multiple data.

Conclusion:

To conclude, we've successfully visualized the 2023 NBA player shooting data using a top view heat map, a side view time tracking chart, and a radial shot chart. We achieved our goals represent at beginning, and our careful design have made the data clearer and more accessible. To further enhance our project, we can incorporate data from different years to compare performance across seasons.

Peer assessment:

Pablo Soto: Top view heat map and website optimization (vis-1)

Yuwei Liu: Side view time tracking and process book design (vis-3)

Shiyi Huang: Radial chart for Season Shot Statistics (vis-2)

Above is the main content distribution, when someone has a problem, the team members help each other.

Common tasks: Processbook textual part and video making.

Thanks for reading!