NBA+: An Information Visualization about current season of NBA

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Msc Robotics MSc Communication and Web Technologies

Information Visualization, University of Aveiro, 2022

Abstract

Data is precious and valuable, and nowadays, there is more and more data being generated, which introduces many problems. Raw data is nothing more than words or numbers, which by themselves do not have much meaning. The field of Information Visualization helps fixing this problem by giving meaning to the data through the best visualization techniques, so that our data becomes meaningful.

In this report we present the description of the work developed in the Information Visualization curricular unit, where we tried to solve a problem regarding meaningless data, more specifically about the current NBA season.

To solve this issue, we developed a web application, NBA+, that applies different data visualization techniques to give meaning to the raw data.

Through our tests, we were able to find that we achieved good results and that our application, which is for now a functional prototype, could with some more work integrate the market to help those who are curious about the NBA

# Motivation and objectives

The main motivation for choosing this theme is the fact that we are NBA fans, and we don't have time to watch the games because they are shown at dawn. Beyond that, and important for our decision, we did not find any data visualization application in our benchmarking research, that could provide efficient and detailed information about the current season of NBA.

That said, our main goal is to address the lack of an online platform that allows the visualization of this type of data in a detailed and efficient way, allowing us to draw conclusions and support decisions based on the analysis of the data visualizations developed.

Additionally, we have considered a list of goals for our platform, so that it can really help in the points that we consider crucial to understand the NBA season.

* View player and team statistics of the current NBA season.
* Compare players and teams.
* Relate variables to player and team statistics (e.g., How position affects shooting effectiveness).
* Understand which players are performing best within their team.

# Users and the Questions

When planning a project, it is very important to define well the target audience of the platform. That was our first step, to understand which audience our application should focus on. Afterwards, and based on the goals of our platform, we made a list of requirements that were mapped to questions that our app should be capable to answer through visualizations.

## Characterization of the users and their context

In this study, which later served as a support for the implementation, we found that the group of potential users of our platform would be something in the context of people who like the NBA and are familiar with the sport, however people that does not have time to watch it because the games play at dawn. Since they like to discuss it with their friends and they are not aware of the performance of players and teams, an application of this type is needed.

## Questions to Answer

Once we had our target audience defined, we then started thinking about the questions we wanted to answer with our platform. For these questions, we first started to think in a more general way and formulated a few generic questions.

* What are the intrinsic attributes of the player?
* Which player, x or y, has been performing better, offensively and defensively?
* Does the position and age affect the performance of the player?
* Which teams are doing better in the current season in terms of statistics?
* Who are the best players on the team, offensively and defensively?

After that, and since we wanted to do usability tests, we created tasks that are also examples of more specific questions that the platform can answer.

* Compare the average of assists of the players of position C (Center) and position PG (Point Guard). In which are the values of the distribution higher?
* Compare the average of Steals and Blocks per games between players in the range of 30-35 years and players in the range 20-25. In which are the values of the distribution higher?
* What is the “rebounding” stat for player Lebron James?
* Compare the values of the stat “outsideScoring” between the players Lebron James, Kevin Durant and Andre Drummond. Who has the higher score?
* What is the average 3 Points Misses and 3 Points Goals for the players Lebron James, Andre Drummond e Kevin Durant?
* What are the teams that have an average age between 23 and 25?
* Compare the distribution of fouls per game between the teams that have an average age between 23 and 25 and 27 and 29. In which are the values of distribution higher?
* Who is the player from the team Los Angeles Lakers that has the higher average of blocks per game?

# Dataset

The dataset used for the development of the platform contains information about the statistics of the players on the current season of NBA.

The data was obtained through the Kaggle online platform.

It contains the following data:

* Rk : Rank
* Player : Player's name
* Pos : Position
* Age : Player's age
* Tm : Team
* G : Games played
* FG : Field goals per game
* FGA : Field goal attempts per game
* FG% : Field goal percentage
* 3P : 3-point field goals per game
* 3PA : 3-point field goal attempts per game
* 3P% : 3-point field goal percentage
* 2P : 2-point field goals per game
* 2PA : 2-point field goal attempts per game
* 2P% : 2-point field goal percentage
* FT : Free throws per game
* FTA : Free throw attempts per game
* FT% : Free throw percentage
* TRB : Total rebounds per game
* AST : Assists per game
* STL : Steals per game
* BLK : Blocks per game
* TOV : Turnovers per game
* PF : Personal fouls per game
* PTS : Points per game

# Visualization Solution

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## Low fidelity prototype and user feedback

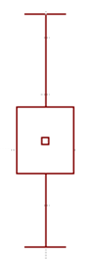
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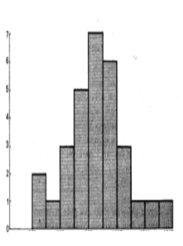
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1. Aspect of the low fidelity prototype

## Functional prototype

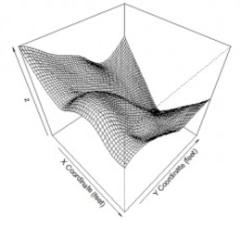
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1. Visualizations to answer question Q1.

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1. Visualizations to answer the question Q2.

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## Implementation challenges

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## Evaluation and changes in the prototype

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# Conclusion and Future Work

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