**Performance analysis of**

**Kobe Bryant’s NBA career**

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**Abstract**

The aim of this project is to analyze the career of basketball player Kobe Bryant who played for team Los Angeles Lakers from 1996 to 2016. We plan to carry out this analysis by producing high quality visualizations. This project would enable us to come up with innovative visualizations for the sport facilitating effective analysis of basketball payers.

**Introduction**

Nowadays big data is being used in almost all the domains. Sports informatics and analytics is also venturing into big data to perform in-depth analysis in order to come up with better strategies and team composition. Baseball is a sport where advanced analytics is already being used to great extent (The movie Money Ball is a great example of how advanced analytics can be used to develop better strategies and team composition which would lead to the success of the team.)

Basketball is another sport in which advanced analytics is gaining prominence. This project would provide a unique way to perform effective analysis by developing rich visualizations. The visualizations would help analyze the game play of a player, his strong zones, weak zones, current form, his performance against different teams etc.

Also, we would like to utilize machine learning techniques to predict a player’s performance in the future. We also plan to visualize this to showcase how good our predictive model performs.

**Background and related work**

Similar analysis was done on basketball player [James Harden](http://grantland.com/the-triangle/future-of-basketball-james-harden-daryl-morey-houston-rockets/). Due to boom in big data there has been deeper integration between sponsorship and players. It is changing the basketball management itself. Many companies are doing sports analytics to accurately predict the winnings.

**Datasets:**

For this project we would be using the dataset provided by Kaggle.

Link: <https://www.kaggle.com/c/kobe-bryant-shot-selection/data>

The original source of this data is from [visit stats.nba.com](visit%20stats.nba.com)

The data set includes 17 features and one class variable. The class variable is binary valued (0 – shot missed ,1 – Shot converted). The features are either discrete or continuous values. The data set contains 25697 examples (After removal of missing data). Out of these 14232 belong to negative class and 11465 belong to positive class. The list of features is listed below.

|  |  |
| --- | --- |
| **Feature** | **Type** |
| action\_type | Discrete |
| combined\_shot\_type | Discrete |
| loc\_x (location on the court along x-axis) | Continuous |
| loc\_y(location on the court along y-axis) | Continuous |
| minutes\_remaining | Continuous |
| Period | Discrete(ordinal) |
| Playoffs? | Discrete |
| Season | Discrete |
| seconds\_remaining | Continuous |
| shot\_distance | Discrete |
| shot\_type | Discrete |
| shot\_zone\_area | Discrete |
| shot\_zone\_basic | Discrete |
| shot\_zone\_range | Discrete |
| game\_date | Date |
| Home/Away | Discrete |
| Opponent | Discrete |
| shot\_made\_flag (Class) | 0 – shot missed ,1 – Shot converted |

**Techniques**

For this project we plan to use Python for cleaning and transforming data and JavaScript (D3.js) for advanced visualization. We would also be using Python for building our machine learning model.

**Research questions and working hypothesis**

The main outcome will be understanding the performance of Kobe Bryant throughout his NBA career.

Few interesting questions which can be addressed through this project are as follows

1. What are Kobe’s strong zones and weak zones?
2. Against which teams did he perform the best and worst?
3. When was the peak point in his career?
4. Would Kobe have performed good if he still played on without retiring?

And more.

**References:**

<https://www.kaggle.com/c/kobe-bryant-shot-selection>

<https://en.wikipedia.org/wiki/Kobe_Bryant>