

Interactive NBA Player Analysis

<https://basketradar.azurewebsites.net/>

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BasketRadar is a basketball player profiler and shot mapper.
Leveraging millions of rows of NBA spatial shot data, we capture unique shooting characteristics at both the player and team levels and provide insightful and interactive visuals.

We clean and process the data to extract key attributes, indexing it in a SQLite database before uploading to Azure Blob Storage for scalability and reliability. Our pipeline persists multiple levels of aggregation to power our dashboard app which offers multiple levels of granularity to the user.

Motivation

What is the problem?

Data visualization has become a critical component of how NBA players and fans understand an NBA player's tendencies. Current visualizations regarding player tendencies carry a tremendous amount of value, but lack interactivity.

Why is it important?

An NBA team that creates a defensive plan around a player's or team's shot tendencies can have a significant advantage when competing in a game. On the fan side, fans use this data to become more informed about their favorite team/player and as a result, these charts enhance the fan experience.

The Approach

Why can it effectively solve your problem?

Our solution offers a robust framework for analyzing the offensive habits of NBA players in an easy-to-use and easy-to-deploy package. By combining simple metrics reporting with illustrative visuals and ML-powered comparisons, our users get the full picture on where and when any given player is most effective as a scorer.

What is new in our approach?

Our approach offers a dynamic alternative to static shot maps, enabling users to explore and compare players and teams based on customizable metrics, Euclidean similarity scores, and hierarchical clustering, with the added benefit of viewing trends over time. This allows users to track how player and team performance evolves, providing deeper insights than traditional tools.

Data

How did we get it?

Daily NBA shot data stored in individual CSV files was obtained using the Kaggle API. Player images and team logos were scraped from BasketballReference.

What are its characteristics?

The raw data consists of records corresponding to each shot taken in the NBA since 2014. These datapoints consist of shot coordinates, time of occurrence, player name and team, and whether the basket was scored.

Experiments and Results

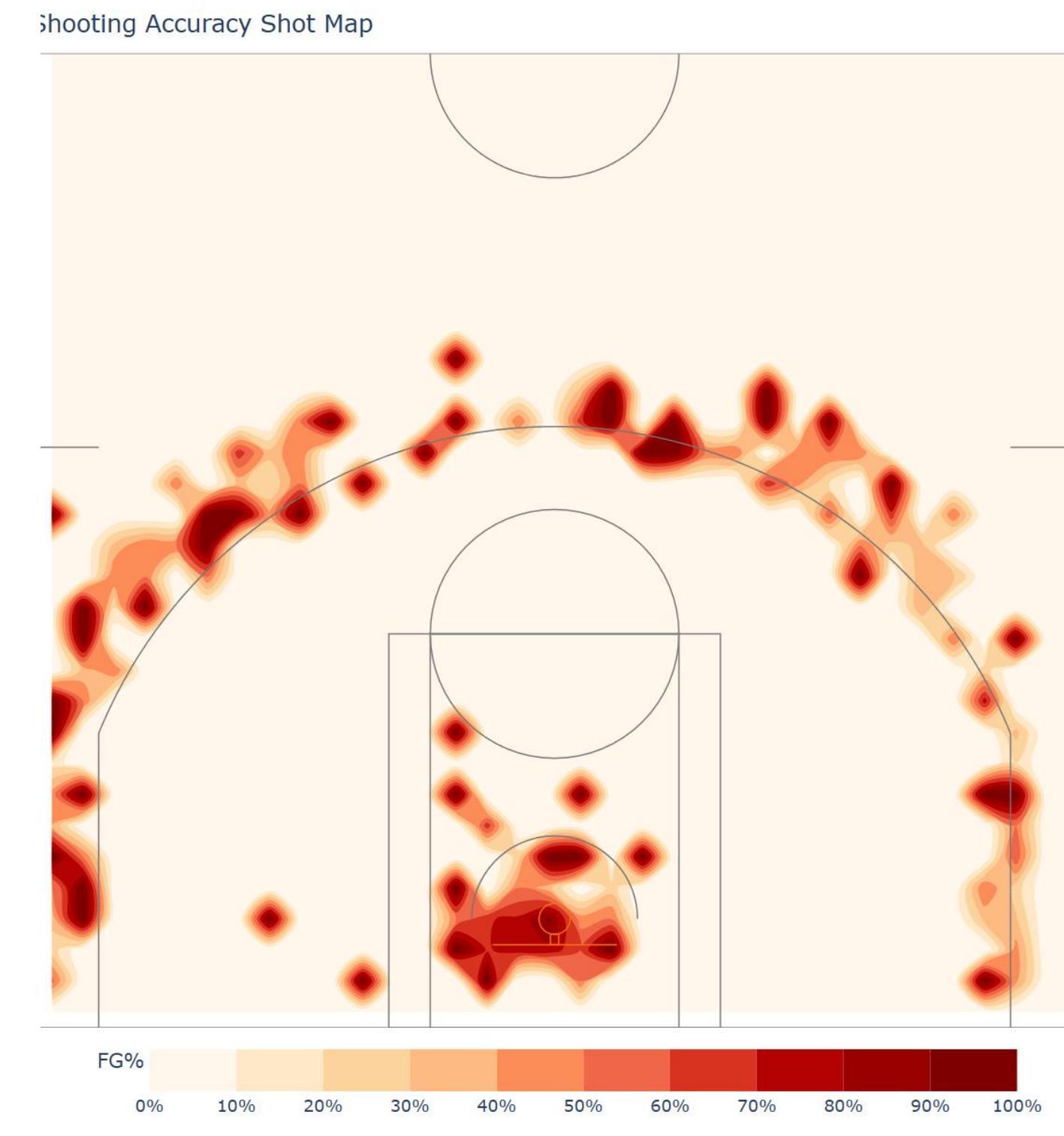
Performance and functional testing, surveys, and cost analysis reveal favorable usability and accuracy in task completion. Compared to similar tools, our methods balance cost-effectiveness and functionality. Future optimizations such as caching could stabilize load time variance and enhance user experience further.

Multiple case studies with current NBA players were also conducted to demonstrate and evaluate the capabilities of BasketRadar. See the top right for an example featuring Royce O'Neal.

Case Study

Royce O'Neal

Power Forward, Utah Jazz and Phoenix Suns

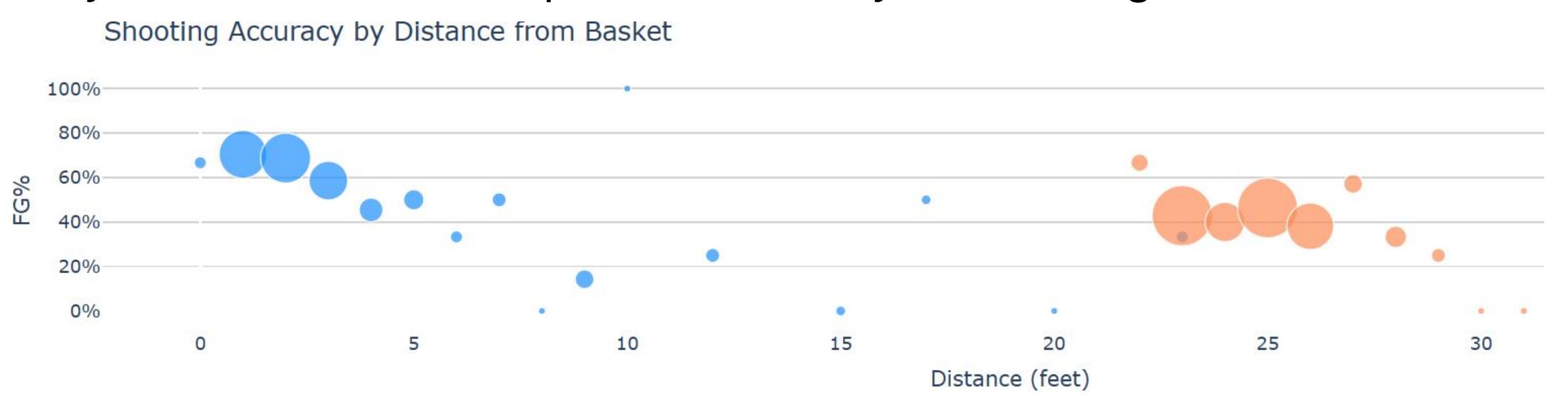


Profile of a player

A frequent three-point shooter adept from both sides of the basket. Plan your defense against him as you strategize at half time, as he shines in the third quarter!

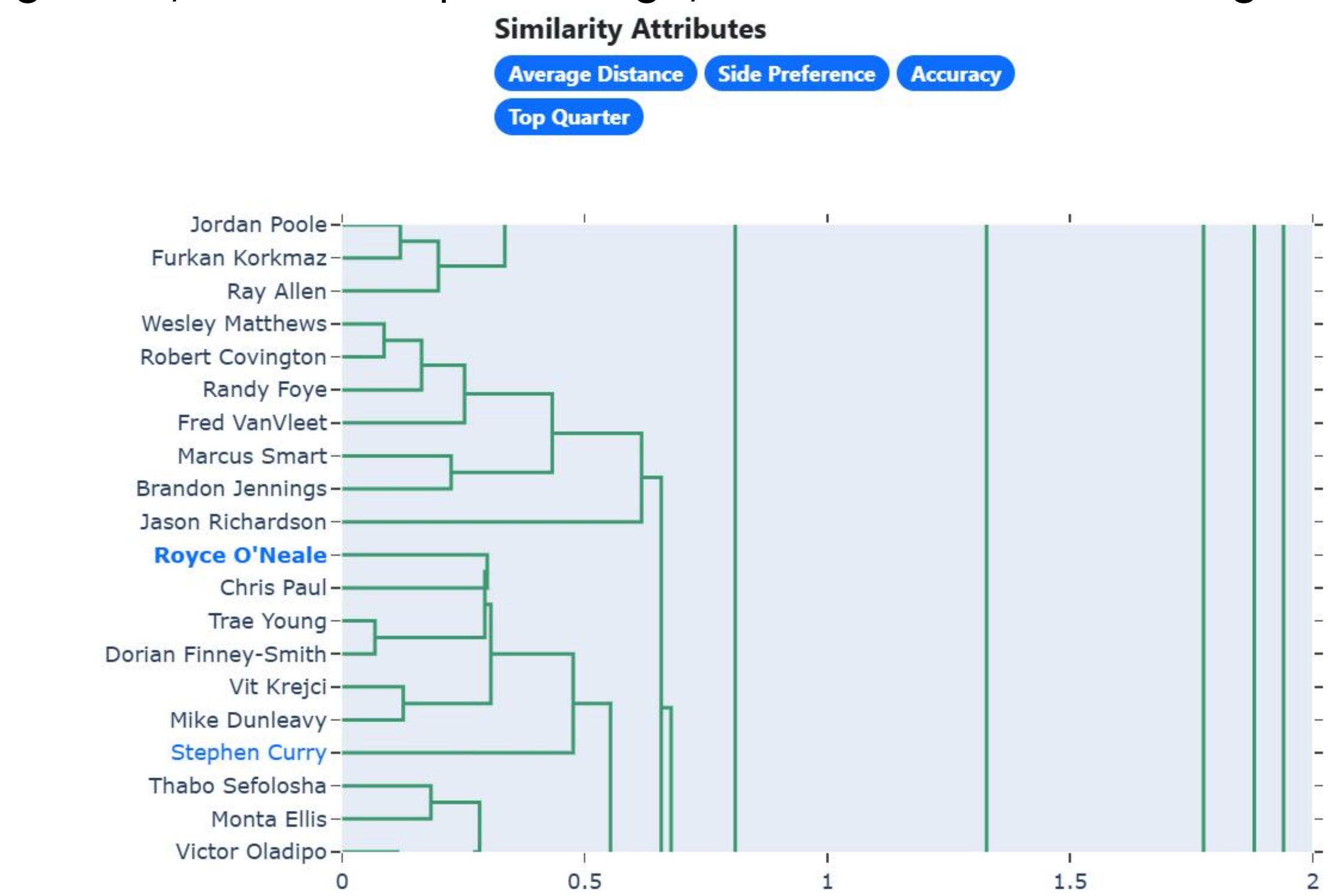
Missing middle

Royce will shoot three-pointers or very close-range.



High-frequency long-range threat

Royce is constantly looking to strike from afar. Often shooting 40% or greater, from three point range, he is a considerable long range threat.



Take your Strategy Further

When you've built an effective defense, use all the information available to you to find out who shoots like Royce.

Performance and User Satisfaction

Median Load Time
3.40 seconds

Player Update Time
1.40 seconds

Team Update Time
2.60 seconds

Ease of Use
91% satisfaction*

Visual Appeal
82% satisfaction*

Performance
91% satisfaction*

* Based on survey responses indicating ratings of "good" or higher (n=11).