

Visual Analytics

NBA Players Performance 24/25

Interactive Visual Analysis

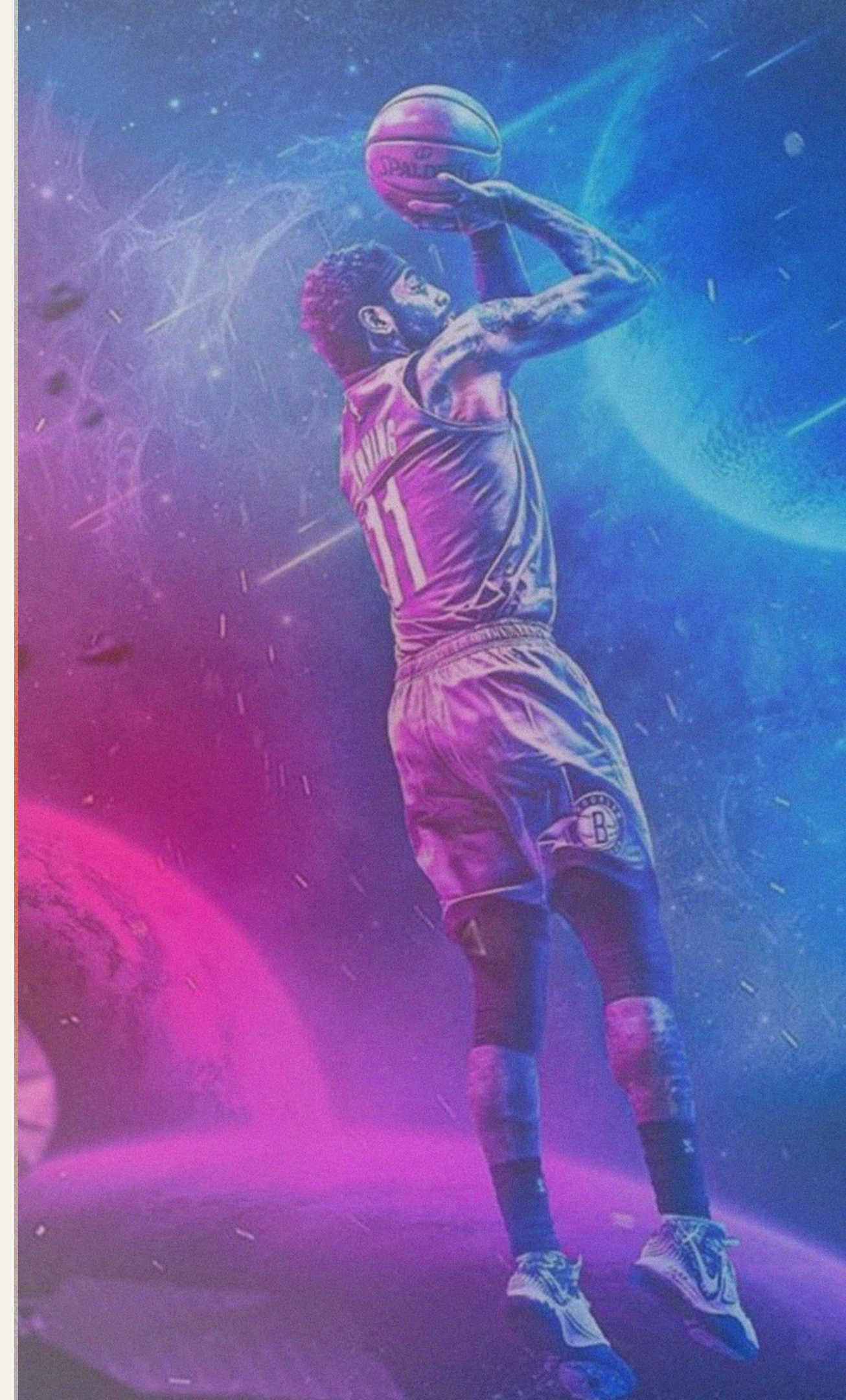
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Introduction

- NBA: premier professional basketball league in the world
- Importance of analytics for player evaluation, strategic decisions and player development
- **Project Purpose:** provide a user-friendly interface for analyzing and visualizing NBA players performance data in the 2024-25 Regular Season
- **Potential users:** helpful and intuitive tool for NBA enthusiasts, coaches, team managers, sports analysts etc.



Data and Analytics

- Dataset of **NBA players traditional statistics** for the ongoing **Regular Season 2024-25**
- **512 players**
- Various metrics between general information and performance
- Some additional data containing player's information and individual stats
- Preprocessing: joining by column and converting some values
- Analytics with **Python Flask** backend computation:
 - Normalization
 - Efficiency value calculation
 - Clustering with K-means algorithm
 - PCA computation
 - PIE growth trend

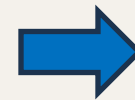
System design

Welcome page and dashboard

NBA PLAYERS' PERFORMANCE ANALYTICS

Interactive visualizations of NBA player performance data.

2024-2025 Regular Season



Players List

Scrollable content with list of 24/25 NBA players

- List for over 500 players
- Each entry contains general information such as full name, team, number and a photo
- Color-coding based on positions
- Main purpose is to facilitate search and selection of players

Guard

Center

Forward

Center-Forward


Forward-Center

Forward-Guard

Guard-Forward


Enter player or team...

Number: 30



Nikola Jokić

Team: DEN
Number: 15



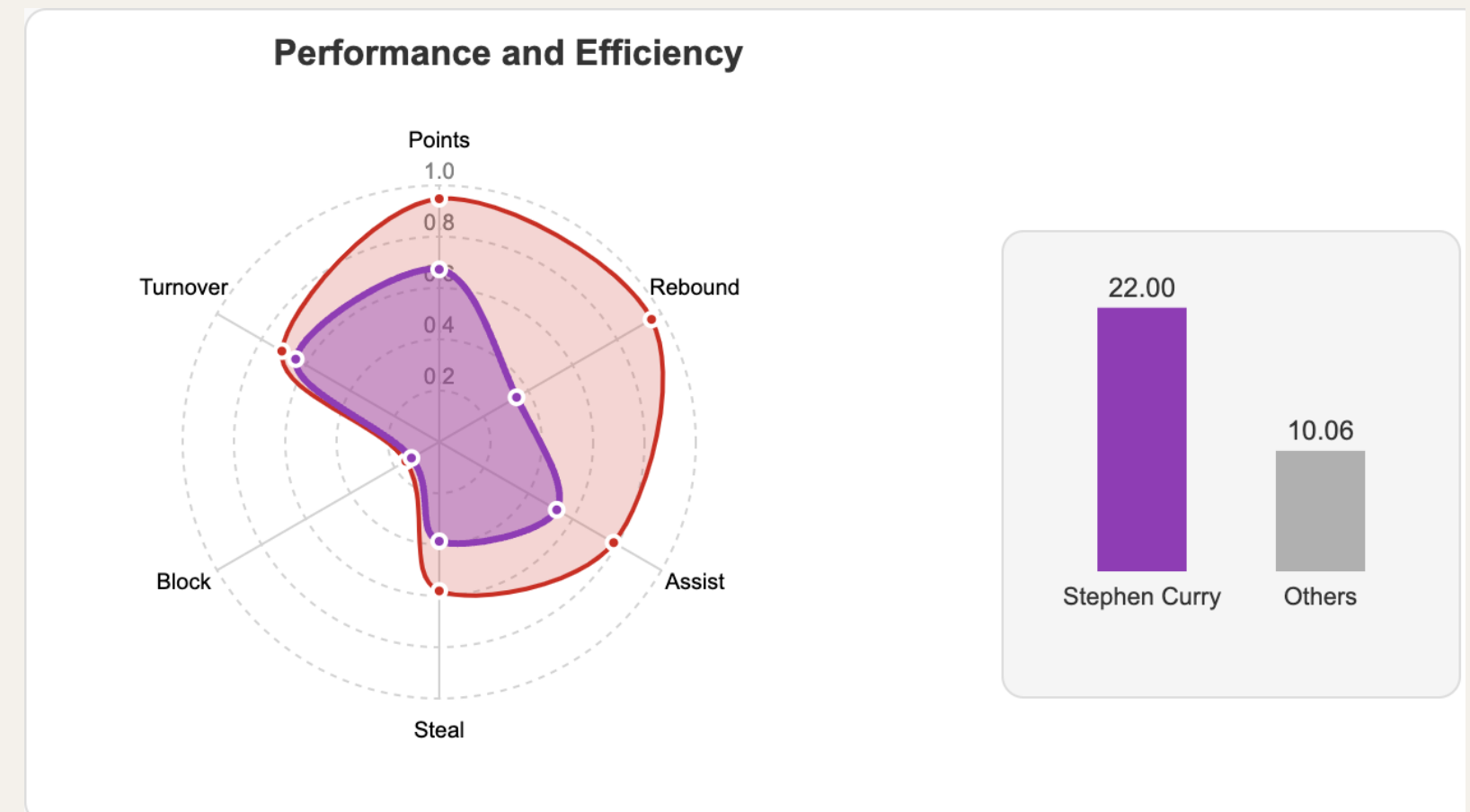
Precious Achiuwa

Deselect (2)

Radar Chart

Individual profiles and efficiency bar chart:

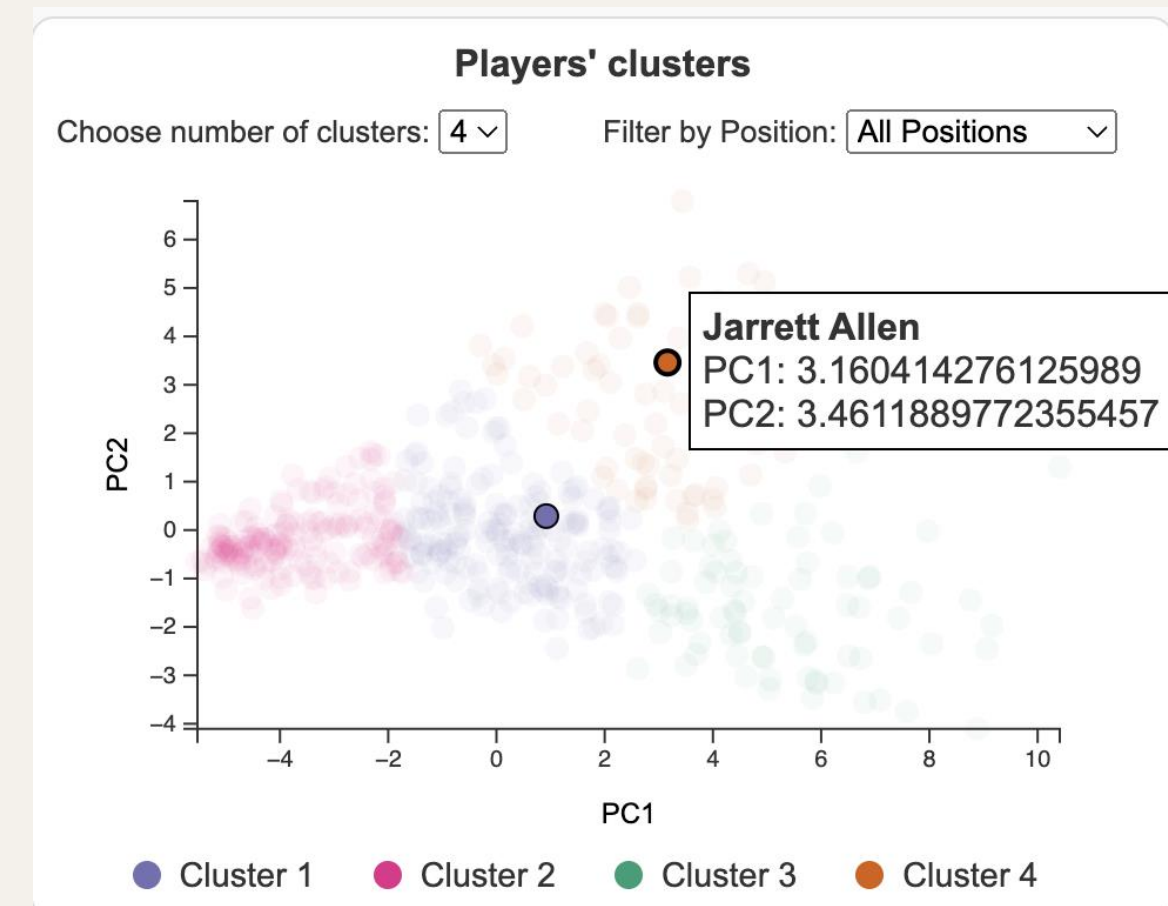
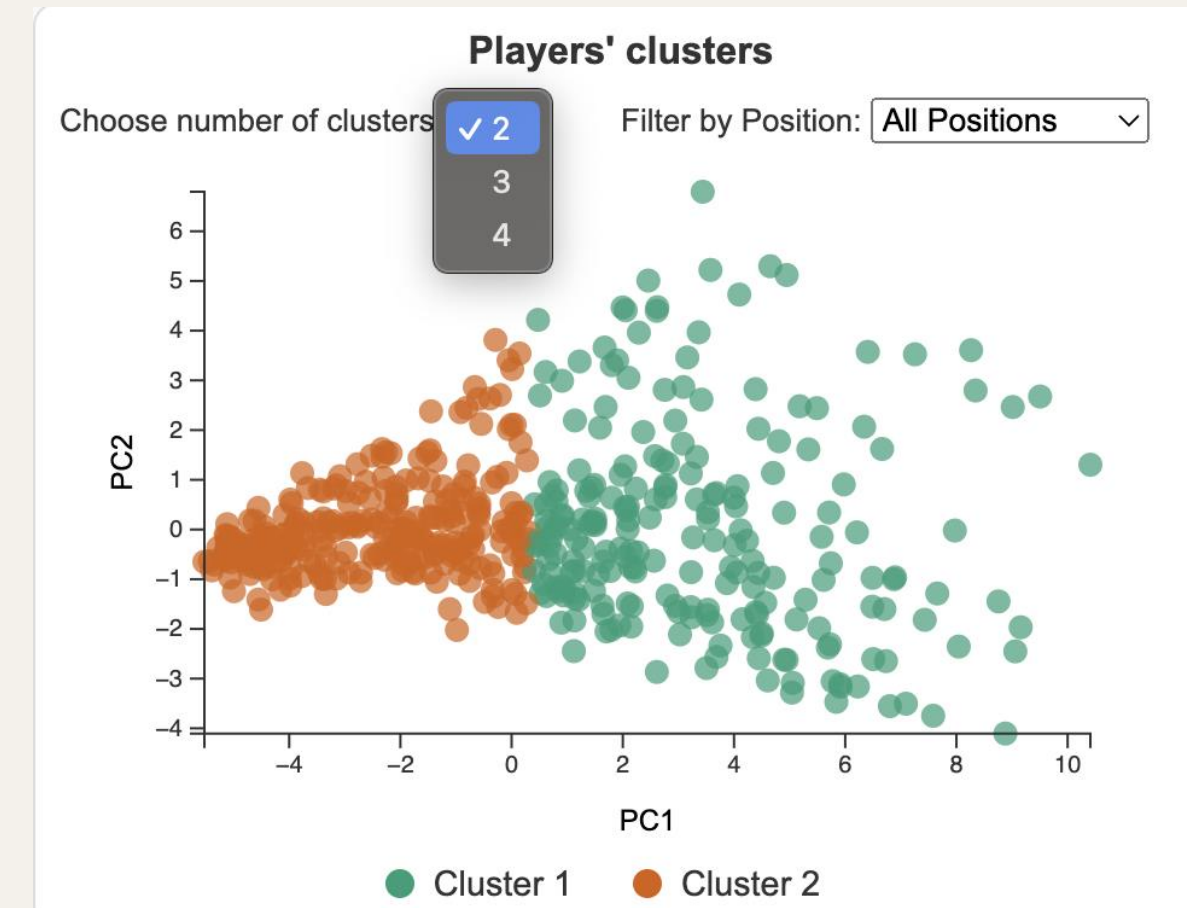
- General performance metrics: Points, Rebounds, Turnovers, Assists, Blocks, Steals
- Color-coding by position
- Coordinated with players list and scatterplot
- Efficiency bar gram
- Why: useful to focus on individual performance profile; visualize player's level with respect to others



Scatterplot

Clustering of players on overall metrics

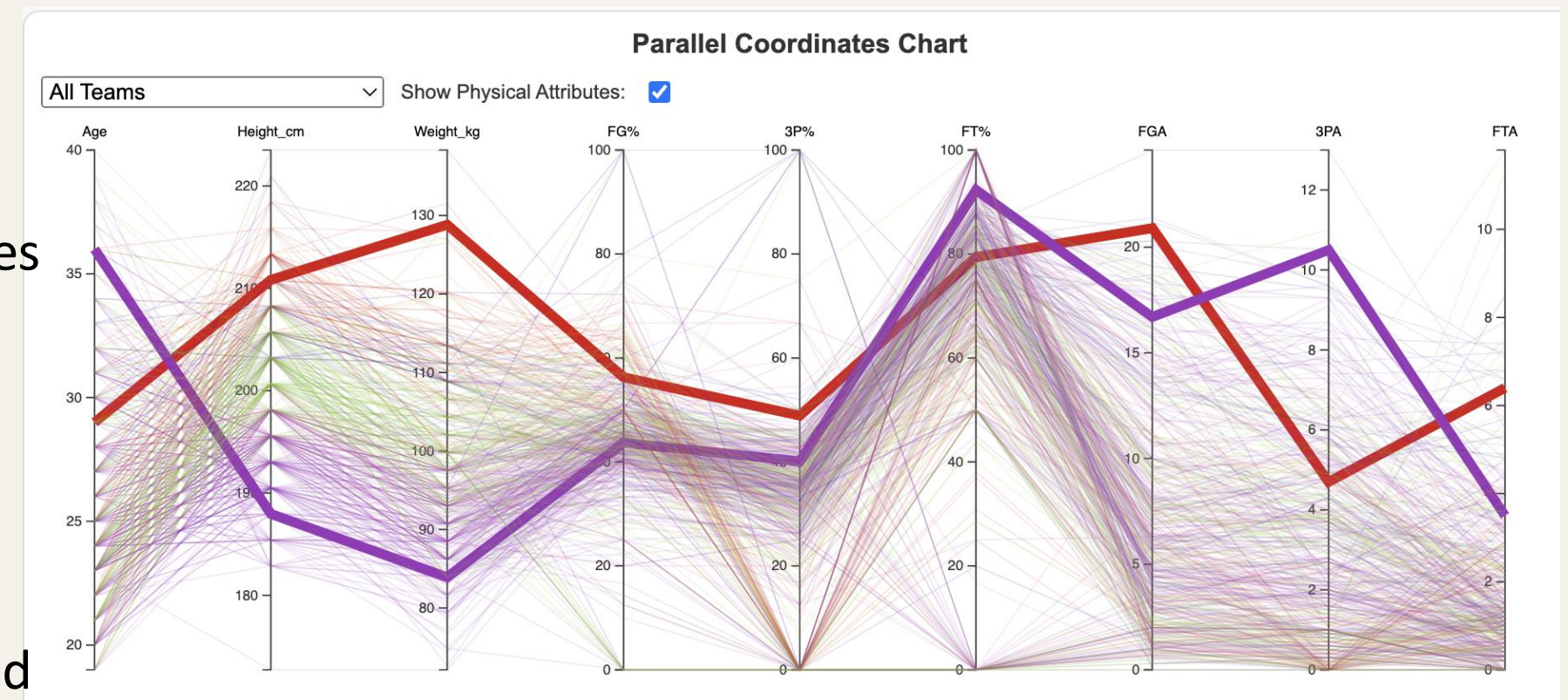
- Principal Component Analysis: 2 components
- Clustering: k-means algorithm
- Coordinated with players list
- Colors for clusters using *d3.scaleOrdinal()* with legend
- Use: divide the players into clusters, visualize their similarities, find eventual outliers



Parallel Coordinates

Players' physical and shooting attributes

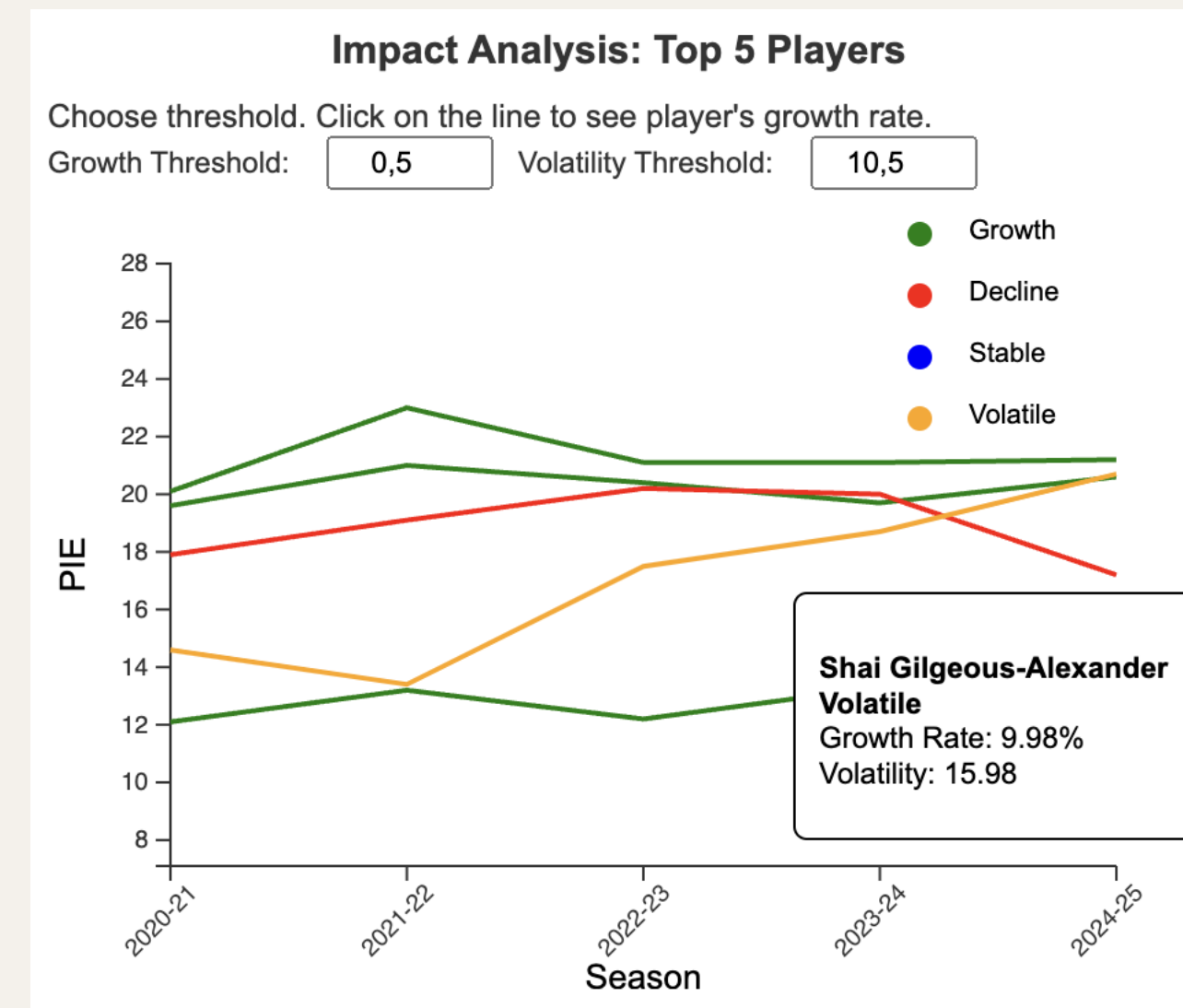
- Age, Height and Weight for physical features
- Free-throws, 3-Points and Field Goals for shooting features
- Color-coded by position
- Coordinated with players list and scatterplot
- Highlight selected players, filter by teams
- Tool for comparing different attributes simultaneously and seeing eventual correlation



Line Chart

Impact progress of the top 5 Players of this season

- Displays PIE (Player Impact Estimate) values of the top 5 players in the past seasons
- Color coded based on growth trend
- Focus on a small set of players and analyze their performance year-by-year



Views coordination

Player selection

Guard

Center

Forward


Center-Forward

Forward-Center

Forward-Guard

Guard-Forward


Enter player or team...



Anthony Davis

Team: LAL

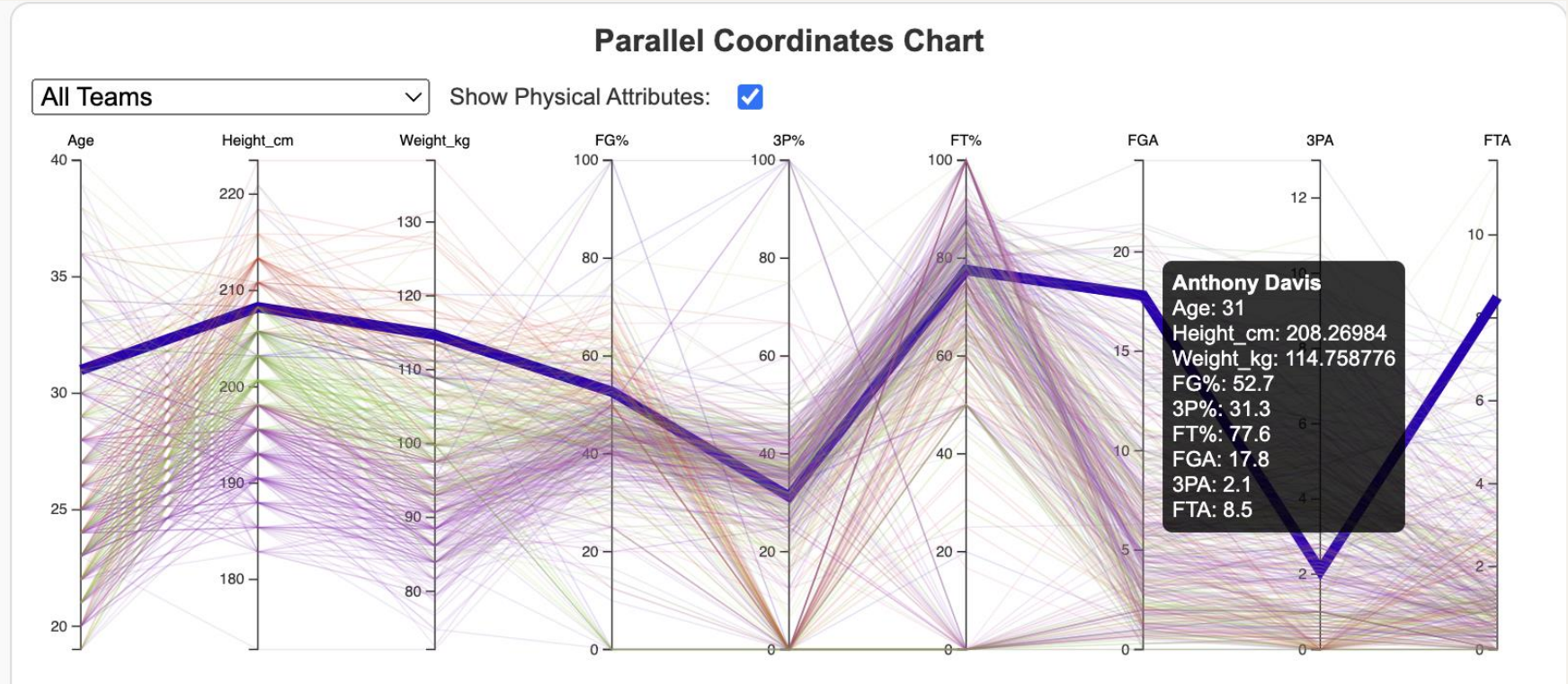
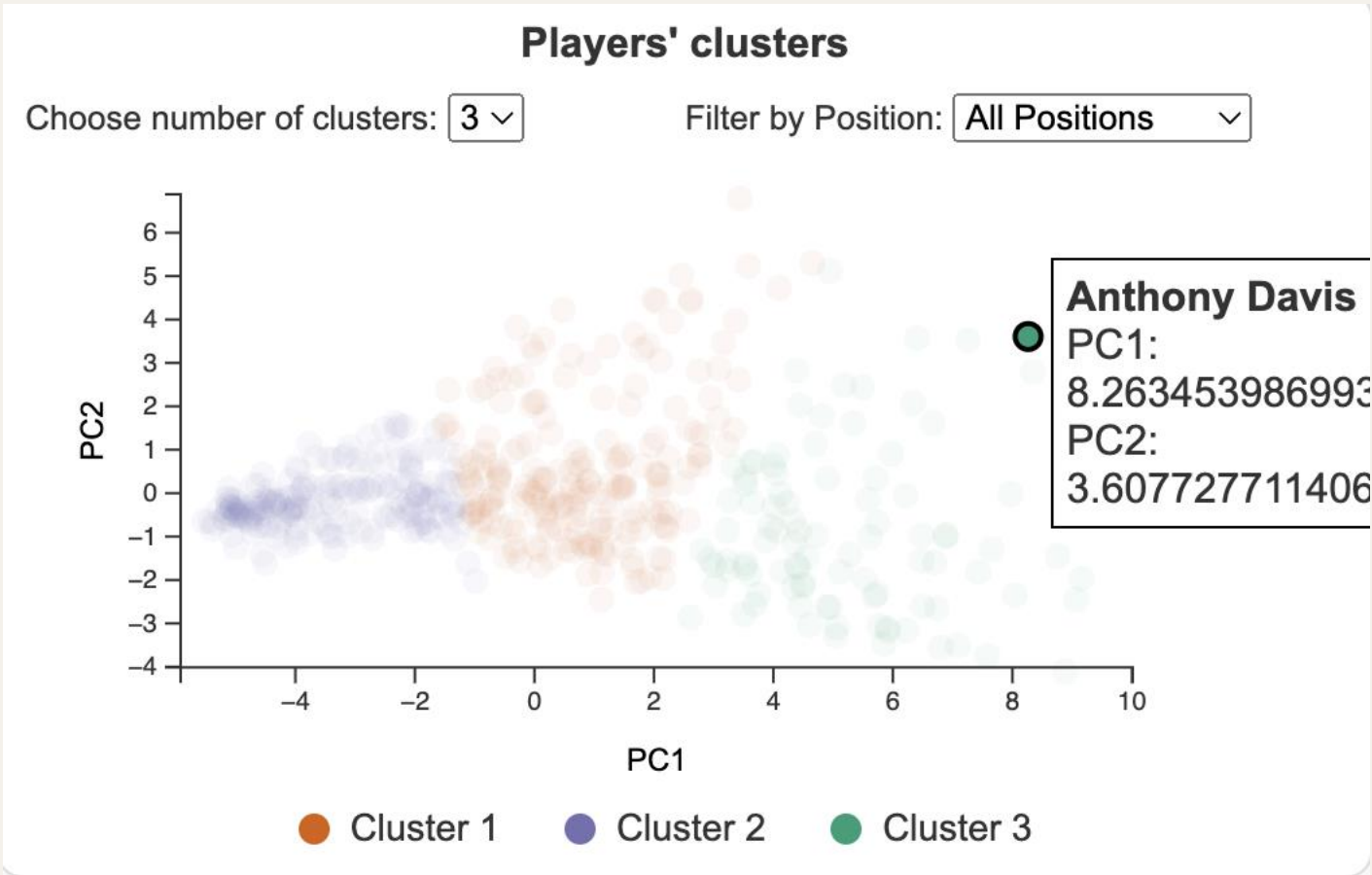
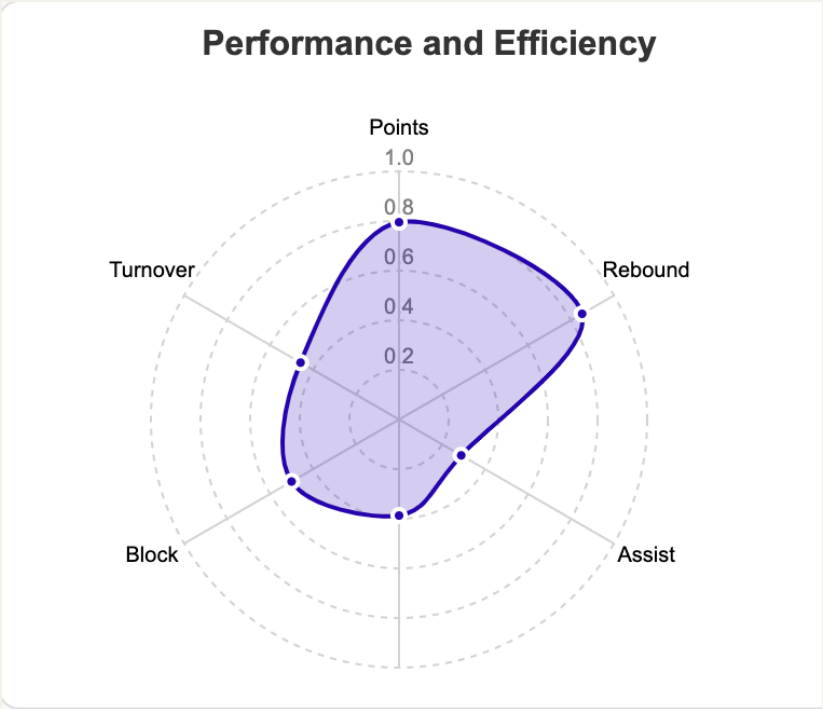
Number: 3



Giannis Antetokounmpo

Team: MII

Deselect (1)



Insights

- Simplified analysis of NBA players: intuitive tools for fans and analysts to explore player performance
- Performance evaluation:
 - coach can identify ones' strengths and weaknesses (radar chart)
 - assessment of players for decision-making on trades or contracts by team managers (efficiency bar)
- Discover similarities and unique or excellent athletes (scatterplot)
- Shooting skills, also in relation to physical characteristics (parallel coordinates)
- Study consistency (line chart)

Related Works

- Research example:
 - *“Exploring Game Performance in the National Basketball Association”*
 - *“Visual Analysis of NBA Player Data”*
- Interactive systems:
 - *“ViziBall”*
 - *“NBAVis”*
- Similar objectives and techniques, different data and approaches

Thank you!