

Force Plate Data Dashboard

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Project Type: Data Analytics & Visualization

Tools Used: R Shiny, R, Data Processing, Interactive Dashboards, SQL

Project Overview

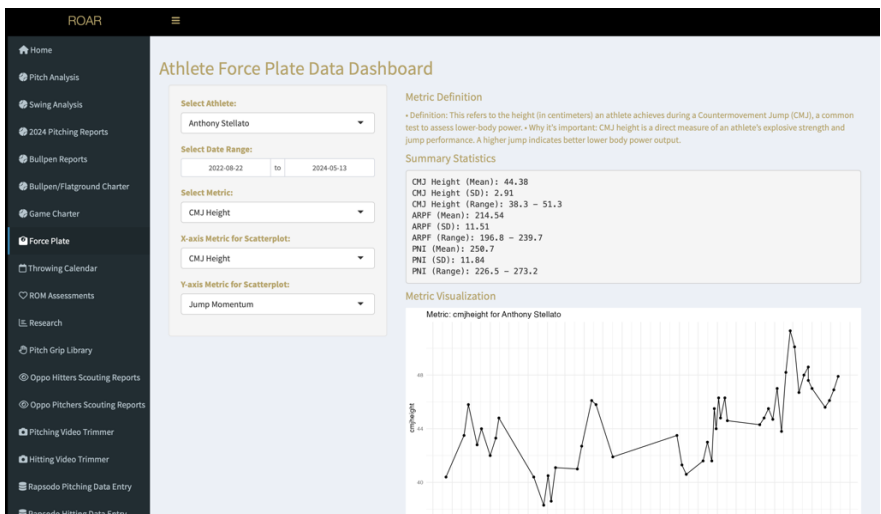
The **Force Plate Data Dashboard** was developed to provide **sports scientists and strength coaches** with an interactive platform to analyze **force plate data** collected from athletes. This tool enhances decision-making in **training, recovery, and performance optimization** by visualizing **key metrics** from force plate assessments.

The dashboard enables users to:

- ✓ **Select an athlete** from a database
- ✓ **Filter data by date range** to track performance trends
- ✓ **Choose specific performance metrics** to analyze
- ✓ **Generate scatter plots** for customized metric comparisons
- ✓ **View summary statistics** for key force plate metrics

Data Workflow

- Data Collection:** Force plate readings are gathered weekly from **baseball, softball, and basketball** athletes.
- Data Processing:** The raw data is cleaned and structured for visualization.
- Visualization & Interaction:** Strength coaches use the **R Shiny dashboard** to explore data through graphs, tables, and statistical summaries.



Key Features

1. Athlete & Date Selection

Users can select an **athlete** and a **date range** to view relevant performance data.

Select Athlete:

Anthony Stellato

Select Date Range:

2022-08-22

to

2024-05-13

Select Metric:

CMJ Height

X-axis Metric for Scatterplot:

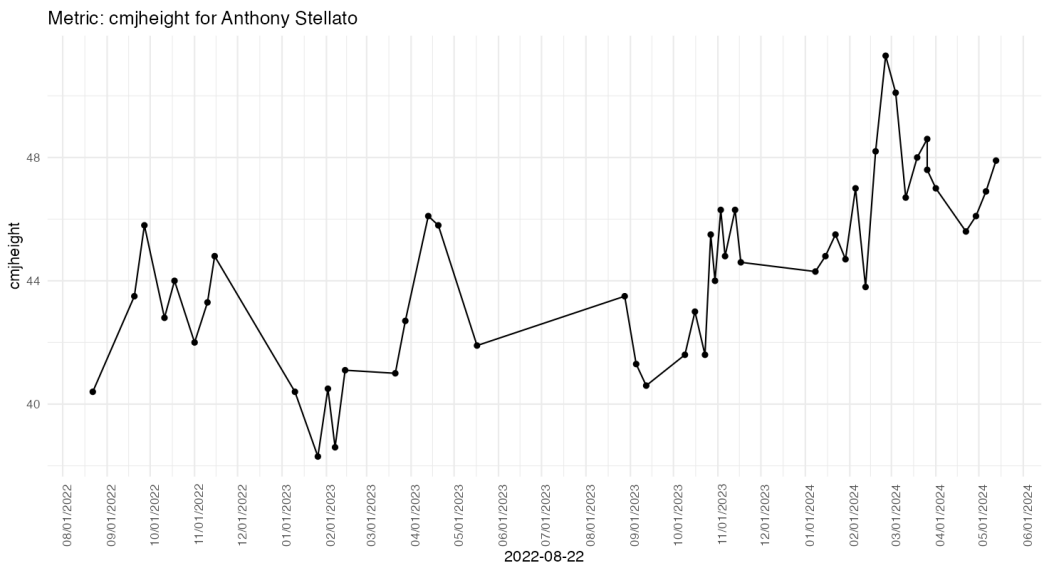
ARPF

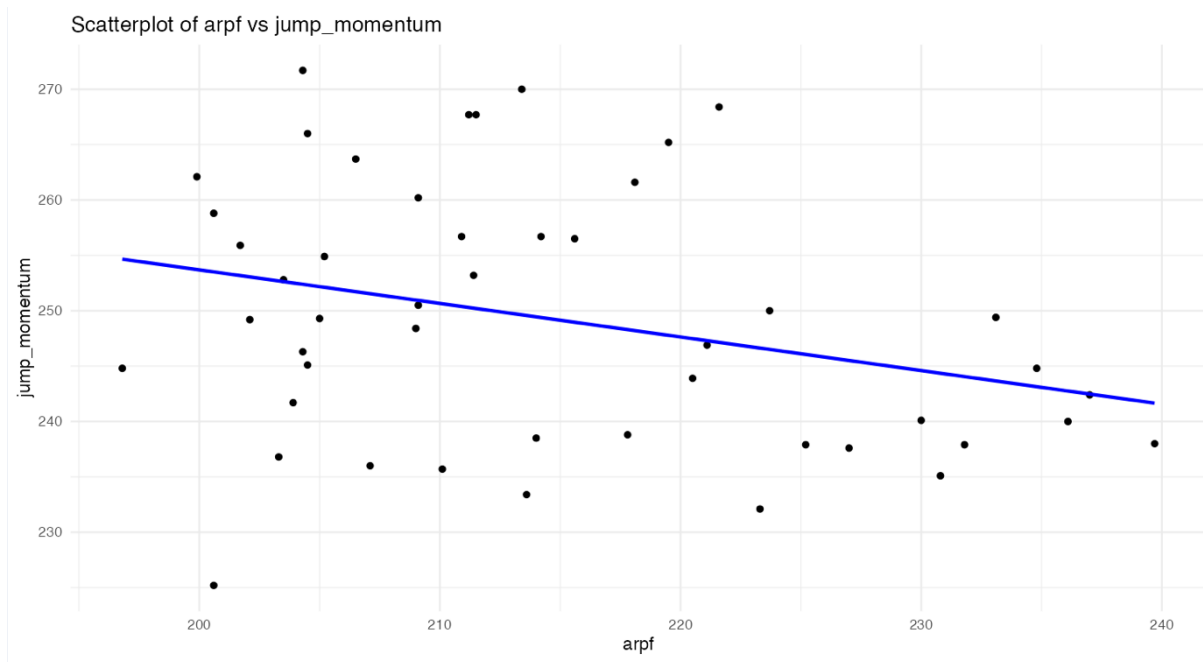
Y-axis Metric for Scatterplot:

Jump Momentum

2. Metric Customization

Coaches can choose which **force plate metrics** to analyze, customizing both **X-axis** and **Y-axis values** for scatter plots.





3. Data Visualization

- **Summary Statistics Panel:** Displays **mean, standard deviation, and range** for each metric for the selected player .
- **Metric Definition :** I included a metric definition section explaining what metric is selected and what that metric is used for in analysis. Reason for this is because players have access to this data and might clarification.
- **Customizable Graphs:** Coaches can compare metrics such as **CMJ Height vs. Jump Momentum** to identify trends.


Metric Definition

• Definition: This refers to the height (in centimeters) an athlete achieves during a Countermovement Jump (CMJ), a common test to assess lower-body power. • Why it's important: CMJ height is a direct measure of an athlete's explosive strength and jump performance. A higher jump indicates better lower body power output.

Summary Statistics

CMJ Height (Mean): 44.38
 CMJ Height (SD): 2.91
 CMJ Height (Range): 38.3 – 51.3
 ARPF (Mean): 214.54
 ARPF (SD): 11.51
 ARPF (Range): 196.8 – 239.7
 PNI (Mean): 250.7
 PNI (SD): 11.84
 PNI (Range): 226.5 – 273.2

Privacy & Data Protection

 Due to **privacy concerns**, **not all data files** are included in this repository. The code provided demonstrates the data processing and visualization methods without exposing athlete-specific information.

Conclusion

This project successfully **bridges the gap** between **raw performance data** and **actionable insights** for sports teams. By using this interactive dashboard, **coaches can tailor training programs, monitor progress, and improve athletic performance** with data-driven decisions.
