FOOTBALL PLAYERS STATS

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WHY VISUALIZE FOOTBALL PLAYERS' STATS?

COACH OF A FOOTBALL CLUB

Helping him deciding which player to ask to his society to buy based on certain specific characteristics

DIRECTOR OF A FOOTBALL CLUB

Helping him choosing the most valuable players on the market based on his budget

FOOTBALL FAN

Helping him to discover new facts and statistics about his favorite football players

DATASET

FIFA 22 COMPLETE PLAYER DATASET

PREPROCESSING

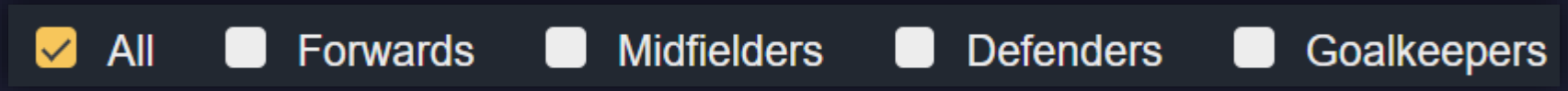
- Select only top 5 european leagues
- Filter out irrelevant columns

RESULTING DATASET

- 57 dimensions
- 2.977 tuples
- AS index = 57 x 2.977 = 175.643

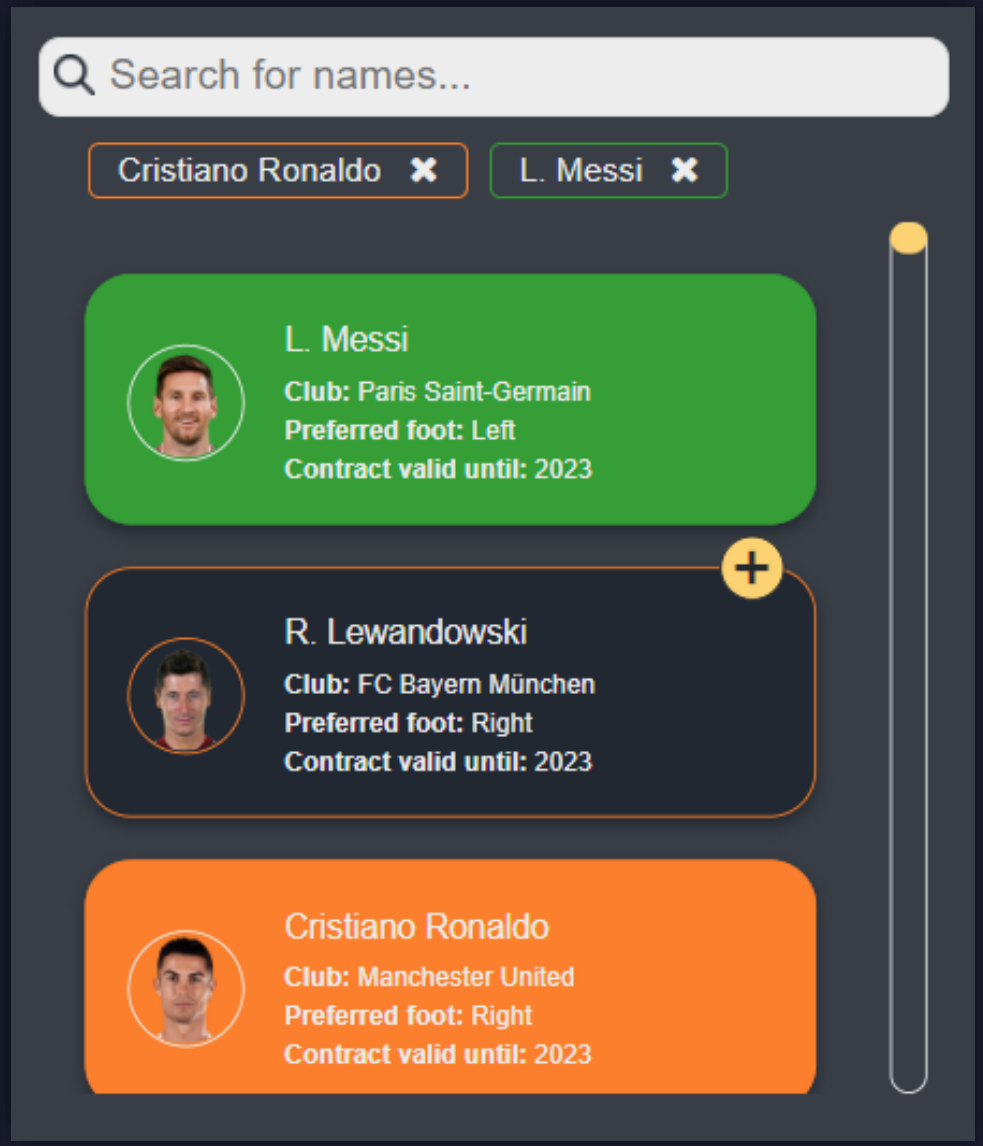
VISUAL ENVIRONMENT

ANALYTICS



CHECKBOXES

- Possibility to select one or more checkboxes to trigger analytics
- Recompute from scratch analytics based on the selected roles
- Dynamically update each visualization according to the selected roles
- All computations are performed on demand through a backend server

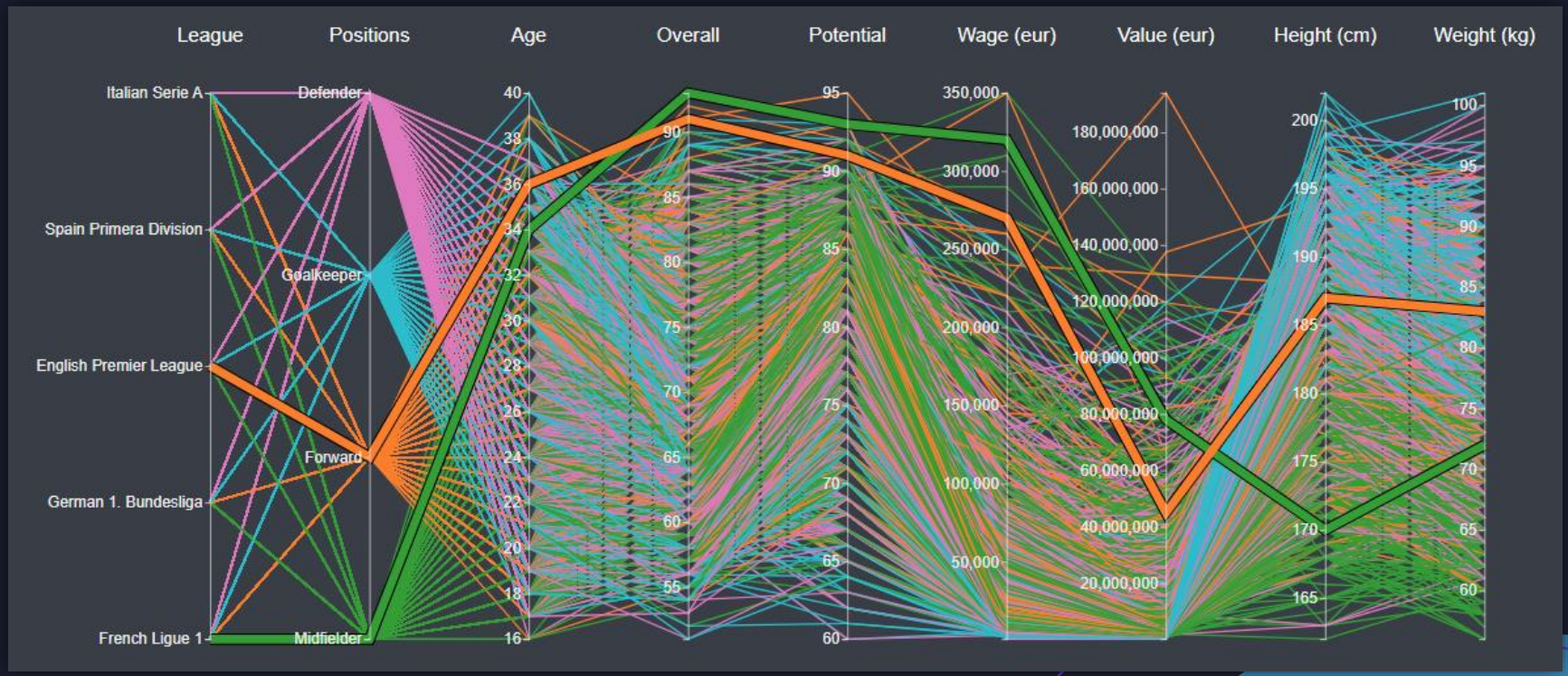


PLAYERS' LIST

- Cards show a players with certain information about them
- Search bar to filter dynamically the players based on their name
- The list is interactive with all others visualization, when the user select players
- Each color represents a role following the global legend
- Indicator for selected player that allows to deselect a player

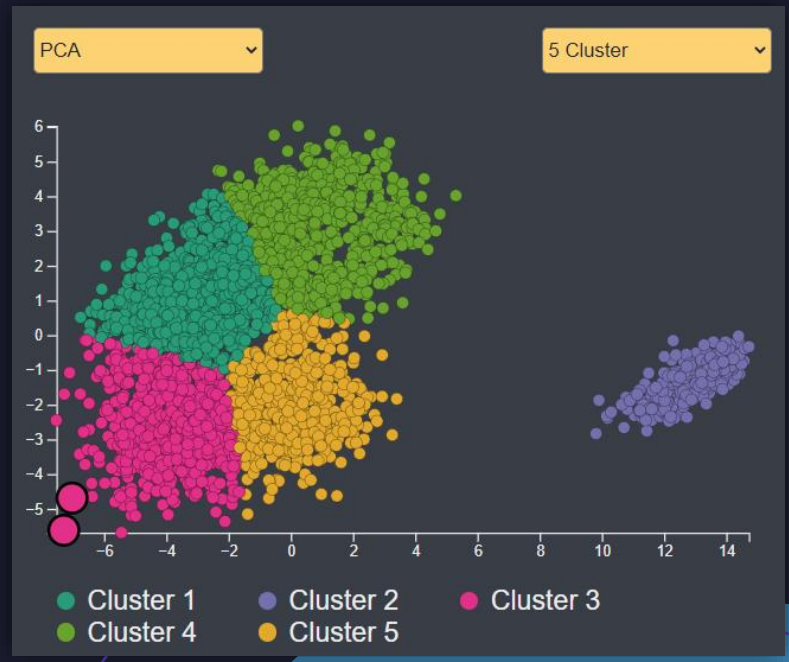
PARALLEL COORDINATES

- Line represents a player, intersecting each axis on the corresponding value
- Shows relationship between players based on a subset of their attributes
- Supports brush on the axis to filter only certain lines, through which interact with list, Scatterplot and RadViz
- Shows only attributes that are relevant for the intended users



SCATTERPLOT

- Circles represent single player
- Shows correlation between players after dimensionality reduction result
- Clusters' colors chosen from categorical scheme "d3.schemeDark2"
- Legend for clusters' colors
- Possibility to choose between PCA and t-SNE algorithms
- Possibility to show clusters
- Supports brush, through which interact with list, Parallel Coordinates and RadViz



SCATTERPLOT - ANALYTICS

DIMENSIONALITY REDUCTION

For PCA and T-SNE are used only a subset of attributes related to players statistics

PCA

- Gives information about players that are far in the original dataset

T-SNE

- Gives information about players that have similar characteristics
- Better separates data into clusters

CLUSTERIZATION: K-MEANS

- Requires choosing number of clusters in advance
- Possibility number of clusters at runtime
- Immediate visual feedback

RADAR CHART

- Polygon represents a player
- Polygons' colors chosen from qualitative sets from "ColorBrewer"
- Legend for players' colors
- Offers a comparison between players based on their statistics
- Possibility to change statistics between physical, attack, defense, keeper and overall

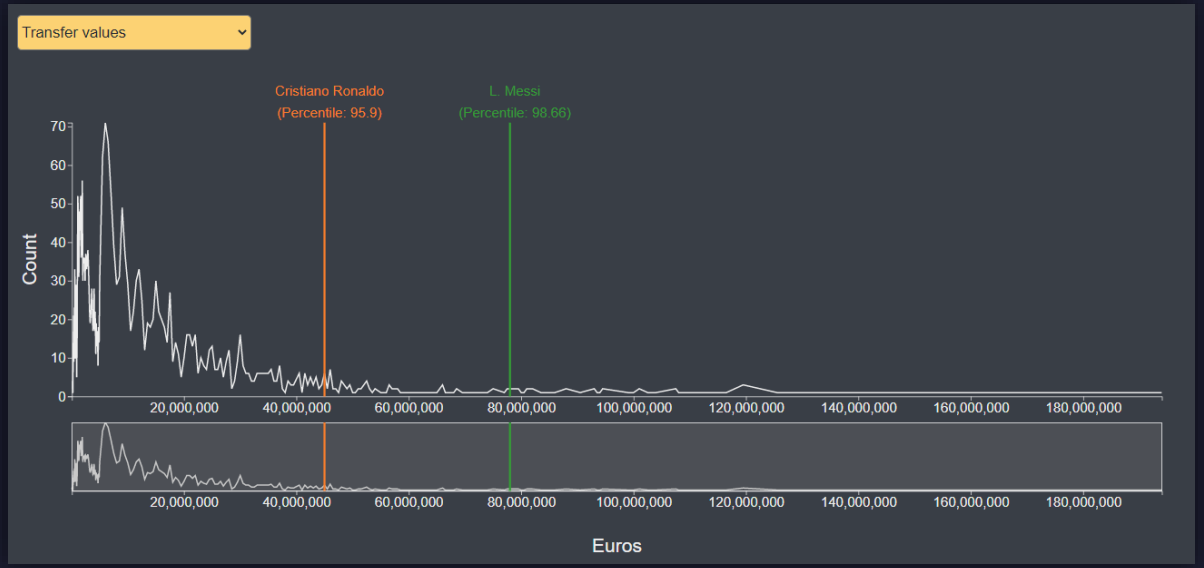
RADVIZ

- Circle represents a player
- Shows proportions among players' attributes
- Circles' colors encode the value of Effectiveness Error or represent players' role
- Legend for Effectiveness Error colors
- Possibility to change statistics between physical, attack, defense, keeper and overall
- Possibility to optimize heuristic with respect to selected players

CREDITS: M. Angelini, G. Blasilli, S. Lenti, A. Palleschi and G. Santucci, "Effectiveness Error: Measuring and Improving RadViz Visual Effectiveness," in IEEE Transactions on Visualization and Computer Graphics, DOI: 10.1109/TVCG.2021.3104879.

LINE CHART

- Global view of the trend of wage and transfer values represented through line
- Small preview below the main graph
- Choose transfer or wage values
- Vertical line represents the percentile of selected players from the list



ANALYTICS

- Computation of numbers of occurrences of players regarding market values or wages
- Computation of percentile

RELATED WORKS

ANALYZING IN GAME MOVEMENTS OF SOCCER PLAYERS AT SCALE

- Represent physical performance of players
- Compute similarities of players based on movement characteristics rather than through the overall attributes
- Find similarities between players using scatterplot through uniqueness and consistency

SOCCER SCOOP

- Measure performance of players and compare them with other players
- Intended user are football directors that want to sign players
- Focused on numerical values rather than aesthetics

RELATED WORKS

TRANSFERMARKT AND SOFIFA

- Both offers interactivity through a simple tooltip in the line chart
- SoFIFA offers also a range selector on line chart to zoom on a certain period

INFOOTMATION

- Shows statistics about players and lets compare them with the average calculated with respect to all the players
- Offers a search bar
- Offers radar chart to show player’s overall statistics

RELATED WORKS

GAUSSIAN MIXTURE CLUSTERING MODEL

- Uses PCA and model-based gaussian clustering to characterize players
- Offers a scatterplot representing the projection of the clusters obtained by their model
- Offers radar to represent mean values for each attribute grouped ng the by players' role

INSIGHTS - CORRELATION BETWEEN PLAYERS OF DIFFERENT ROLES

INSIGHTS - SPEND MONEY ON A PLAYER WISELY

INSIGHTS - DISCOVER NEW FACTS ABOUT PLAYERS

CONCLUSIONS

This work tried to offer an interactive dashboard to all football fans and professionals, taking advantage of multiple visualizations coordinated each other

Users can discover correlations between different players and obtain useful insights

Users can perform on-demand analytics through which they can refine their analysis

DEMO