Global Evolution of Elite Men's Tennis (1970s–2020s)

Geographical Analysis of ATP Top 100 Players

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Introduction

Men's professional tennis has undergone significant transformation over the past five decades, evolving from a sport dominated by a small number of nations into a truly global competition. This project explores the **geographical distribution and regional dominance of elite men's tennis players** using **ATP Top 100 ranking data** from the **1970s to the present day**. By combining player demographic information with historical ranking data, the study examines **where the world's top players come from and how this distribution has changed over time**. Through a **choropleth map as the main visualisation**, supported by regional trend analysis, the project reveals long-term patterns of dominance, decline, and emergence across different regions. The visualisation-driven approach allows complex temporal and geographical trends to be communicated clearly, supporting a data-driven narrative about the global evolution of elite men's tennis.

The Challenge

Several challenges were encountered during the development of this project, primarily related to **data integration, consistency, and visual representation**. One of the main difficulties was combining ATP player information with historical ranking datasets spanning multiple decades, as player names, country codes, and data formats were not always consistent across sources. This required extensive preprocessing to standardise country names, resolve duplicates, and ensure accurate mapping between players and rankings. Another challenge involved preparing the data for **geographical visualisation**, particularly ensuring that all countries aligned correctly with Tableau's geospatial recognition for the choropleth map. Additionally, representing fair comparisons across decades posed a challenge, as the number of countries represented and the global reach of tennis increased over time, potentially influencing visual interpretation. Finally, designing a poster that balanced **visual clarity with narrative depth** required careful consideration of layout, colour usage, and annotation, to ensure the main story remained clear without overwhelming the viewer with excessive detail.

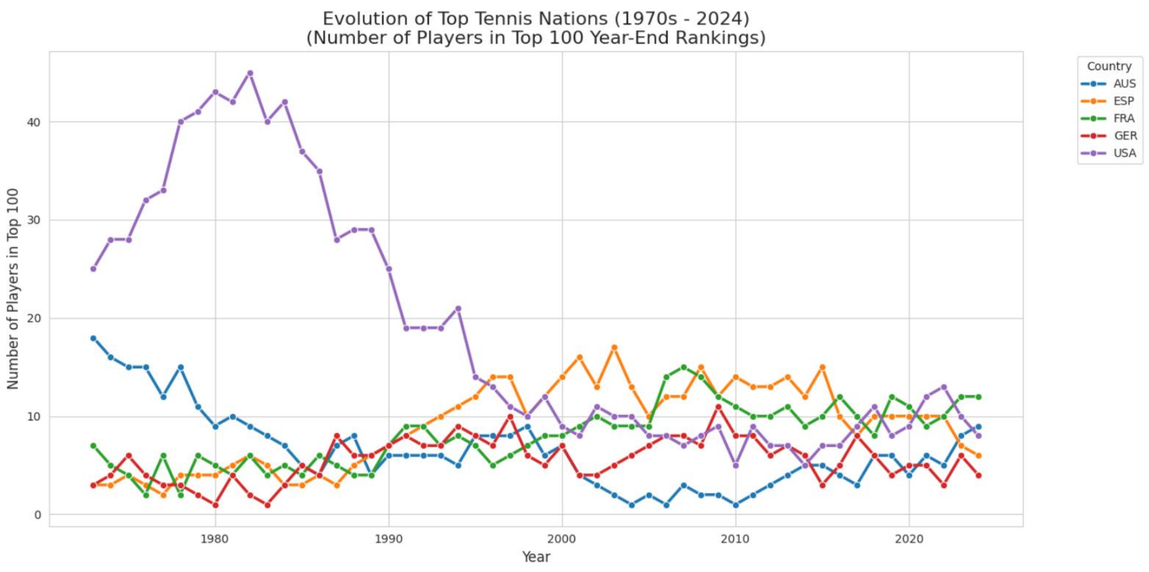

Figure 1. Evolution of Top Tennis Nations (1970s–2024). A time-series analysis of the Top 100 rankings, illustrating the long-term decline in US dominance contrasted with the rising consistency of European nations.

Conclusion

This analysis highlights a significant geopolitical shift in professional tennis, marked by the historical decline of US hegemony and the rising consistency of European nations. Simultaneously, the global distribution map reveals a sharp disparity in representation, showing that nations in Asia and Africa significantly trail behind these dominant regions in the elite leaderboard.

References

[1] J. Sackmann,"tennis_atp",GitHub.[Online].Available: https://github.com/JeffSackmann/tennis_atp/blob/master/README.md. [Accessed: Nov. 06, 2025].

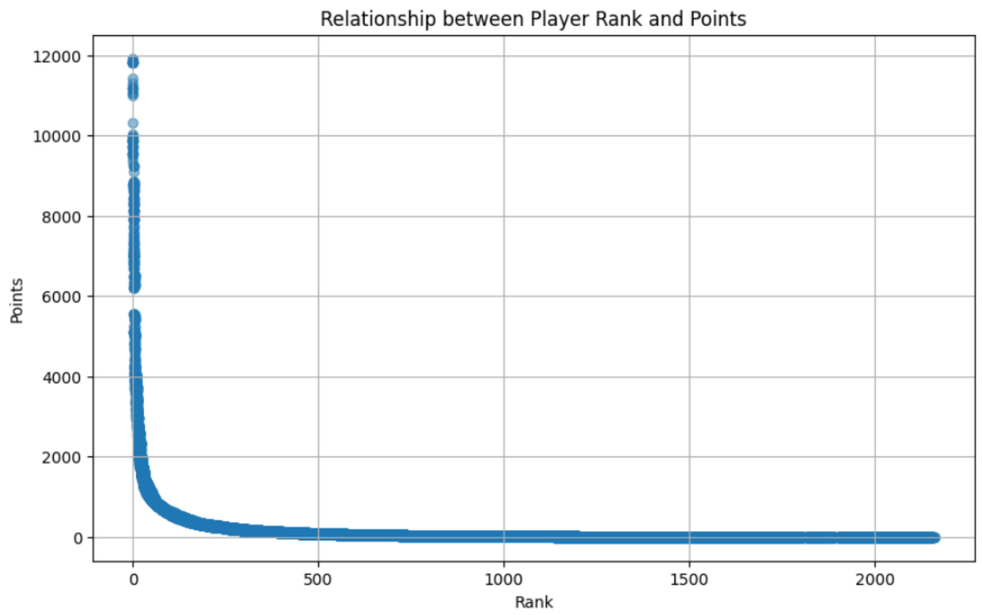

Figure 3: Inverse Correlation of Ranking vs. Points. This scatter plot illustrates that player ranking is inversely proportional to accumulated points.

Design Methodology

The design methodology for this project followed an **iterative, user-centred visualisation process**, informed by principles of information visualisation and the Critical Design Strategy (CDS). The process began with exploratory data analysis and preprocessing in Python to understand the structure, limitations, and inconsistencies within the ATP player and ranking datasets. Early design sketches and prototype visualisations were used to evaluate different visual encodings, leading to the selection of a **choropleth map** as the primary visualisation due to its effectiveness in communicating geographical distributions. Throughout the design process, several challenges influenced methodological decisions, including ensuring consistent country mappings across decades and avoiding misleading interpretations caused by varying country sizes and data density. Supporting visualisations, such as regional aggregation views and a temporal line graph, were introduced to address these challenges and provide complementary perspectives that strengthened the narrative. Design iterations focused on improving clarity, visual hierarchy, and interpretability through careful use of colour, layout, annotations, and metadata, ensuring the final poster effectively balances analytical depth with accessibility for a broad audience.

Implementation

The implementation of this project began with extensive **data preprocessing** to ensure consistency and reliability across multiple ATP datasets spanning several decades. Player demographic data was first cleaned and standardised before being integrated with individual ranking datasets for each decade. This integration required resolving inconsistencies in player names, country codes, and missing values. During this stage, an exploratory analysis was conducted to examine the relationship between **player ranking and ranking points**, revealing an **inverse relationship**, where higher-ranked players accumulate more points. This validation step helped confirm the correctness of the ranking data before visualisation. The processed data was then reshaped and aggregated to prepare dedicated datasets for **Tableau-based geographical visualisation**, including country- and region-level summaries. In parallel, a separate implementation was developed to generate a **line graph illustrating the evolution of top tennis nations from the 1970s to 2024**, which served as a supporting temporal view. The main challenge throughout the implementation was maintaining comparability across decades with differing levels of data completeness and global representation, which was addressed through careful filtering, aggregation, and validation prior to constructing the final **decade-wise choropleth maps** in Tableau.

Our approach

Our approach focused on transforming the idea of tracking the global evolution of elite men's tennis into clear, data-driven visualisations. After preprocessing and integrating historical ATP ranking data, we translated geographical patterns into a decade-wise choropleth map supported by temporal line graphs, addressing challenges such as inconsistent country mappings and cross-decade comparability through careful aggregation and validation.

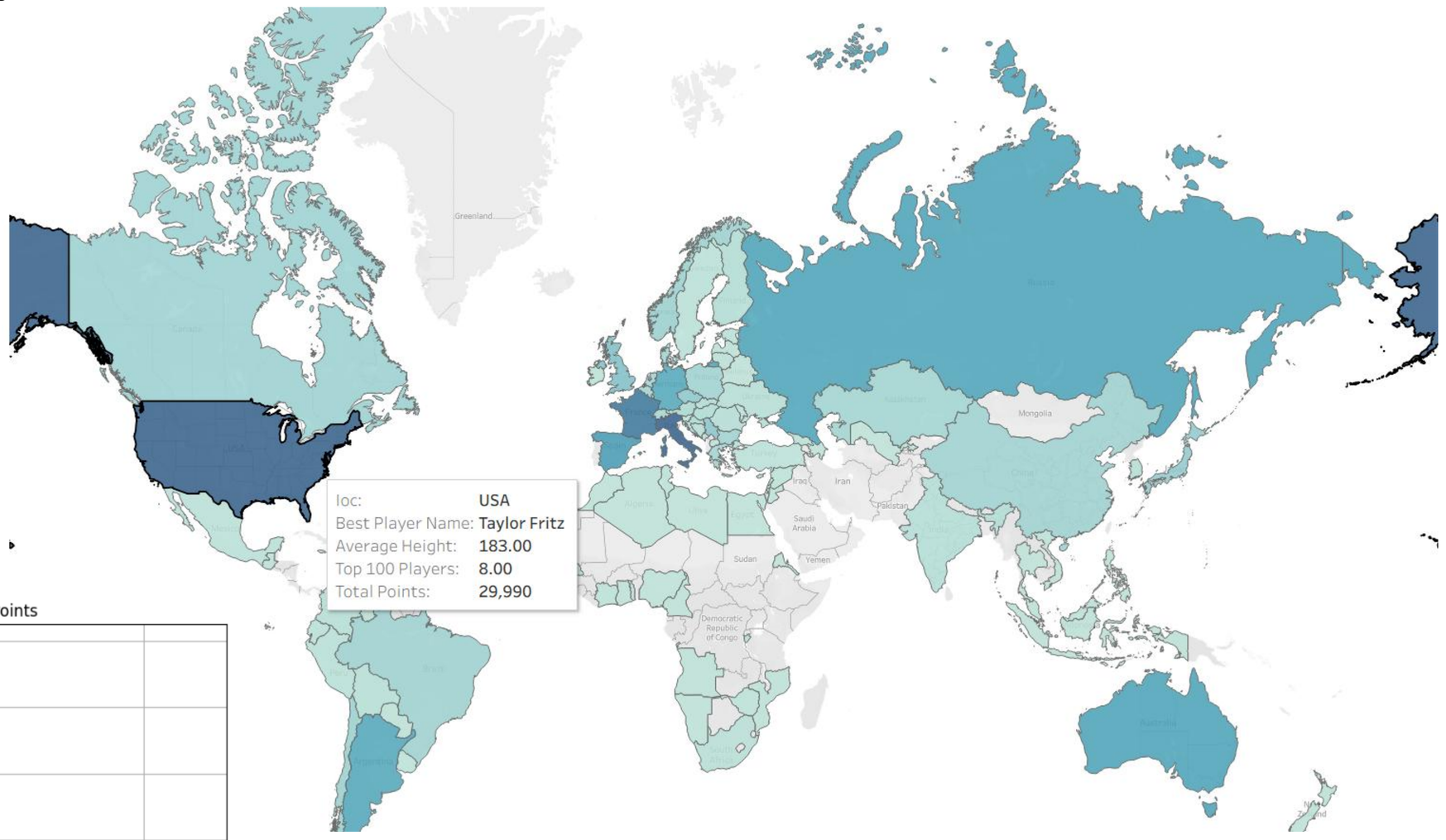

Figure 2. Choropleth Analysis of World Rankings. A global map illustrating the distribution of the Top 100 players, highlighting national dominance through a synthesis of total accumulated points and the number of ranked athletes per country.