

RACKET SCIENCE

TENNIS

PROCESS BOOK



Who is the GOAT ?

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INTRODUCTION

Have you ever found yourself arguing with friends about who's the greatest sport player of all time? Whether it's basketball, football, or tennis, debates about the GOAT (Greatest Of All Time) are common—and passionate. That's exactly what happened to us: everyone had their personal favorite, and no one could agree. So, we decided to settle it once and for all—by using data to discover **who is the ultimate GOAT in tennis**.

DATASET & PREPROCESSING

Our first challenge was to decide what criteria really define tennis greatness. Tennis can be measured in so many ways, but we narrowed it down to a set of five main categories:

- Overall GOAT
- Service performance
- Performance on different surfaces
- Net play
- Doubles
- Tournament success

Because tennis is a sport followed closely by fans and analysts, we had access to a wealth of statistics, much of it organised into comprehensive and well-maintained datasets. This meant we didn't have to spend too much time on heavy preprocessing.

Instead, we focused on cleaning and filtering the data to keep only what was truly relevant for our analysis. To cover all our chosen categories, we combined several sources.

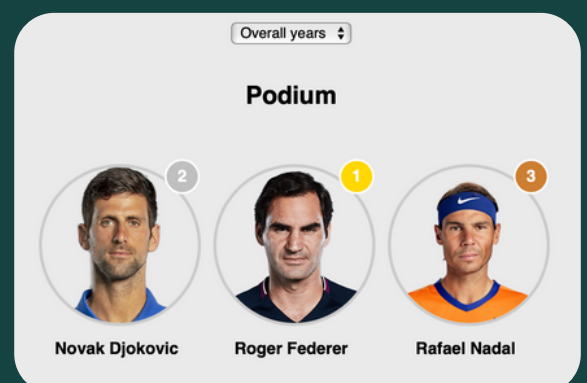
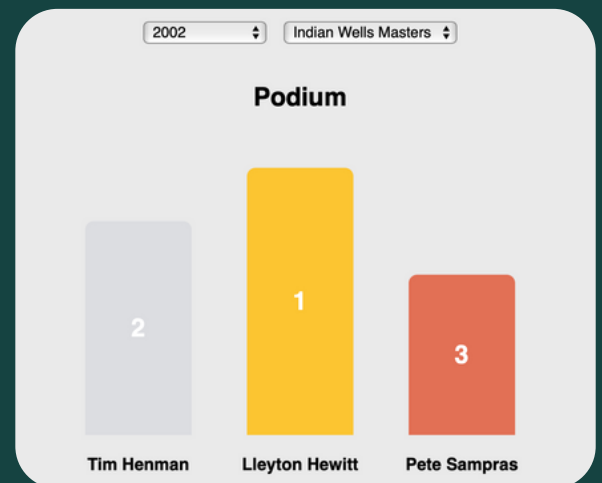
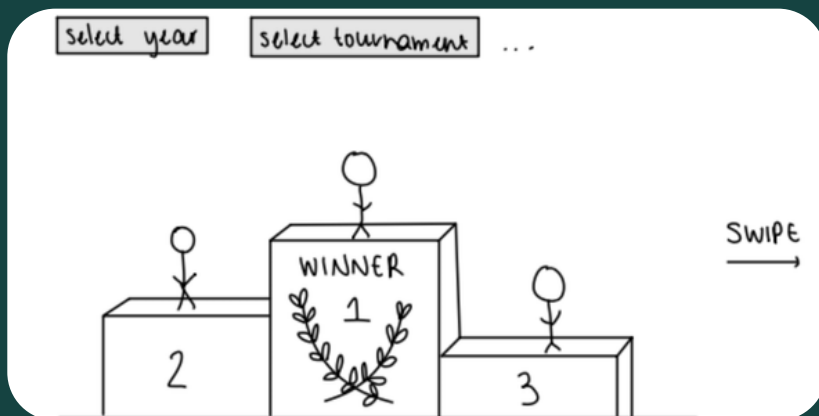
Jeff Sackmann's Github was especially valuable, providing match outcomes and player statistics such as titles, aces, first serves, and win percentage for both men and women, and data from all major tournaments—perfect for our Tournaments and Overall categories. His datasets also include doubles match outcomes and team performances, which we used for the Doubles category, as well as detailed shot-by-shot data, which enabled us to analyze net play and identify the top performers at the net.

For playing surfaces, we relied on the **Ultimate Tennis Matches Dataset** from Kaggle, which details the surface each match was played and won on. Additionally, the **Huge Tennis Database** and the **Association of Tennis Professionals Matches** datasets provided deep resources for player rankings, match results, and statistics—helpful for evaluating overall greatness and service performance.

VISUALISATIONS

Visualising Greatness

When it comes to showcasing a ranking, what better metaphor than a podium? Initially, we considered a classic stepped podium layout, similar to what you see at actual award ceremonies. But we quickly realized that putting a face to the Greatest of All Time made the experience more engaging and personal. So, instead of choosing one format over the other, we decided to **combine both**.



For the Global GOAT category, we had a manageable number of contenders, which allowed us to include player photos alongside their ranks. For more specific and data-heavy categories, such as Tournament Performance or Net Play, where storing images for every player would be impractical, we opted for a cleaner, stepped layout that prioritises clarity and comparison.

This dual approach lets us highlight standout players while keeping the design intuitive and visually compelling across all categories.

Greatness through time

Tennis is one of the most demanding sports when it comes to maintaining long-term excellence. Injuries, mental fatigue, and fierce competition make it incredibly difficult for players to stay at the top year after year. That's why sustained performance over time is particularly impressive and worth celebrating.

Our **bubble chart** is designed to do just that. It highlights the **top 15 players** in each category for any given year, allowing us to visualize not just who reached the top, but who remained there. These players may not always have been ranked world number one, but their consistent presence among the elite speaks volumes about their resilience and greatness.

This visualisation is a tribute to longevity in tennis. A key, and often underrated, dimension of true GOAT status.



Fine-grain analysis of greatness

We didn't want visitors to our website to feel misled or left in the dark by our visualisations. On the contrary, our goal was to clearly explain **how and why** we computed each player's score in the **Global GOAT ranking**. To provide this transparency—and to give users a deeper understanding of what makes a tennis player truly great—we designed an interactive spider chart.

This chart breaks greatness down into what we believe are the **five most meaningful performance indicators** of tennis excellence, each weighted according to its importance:

1) Number of Weeks as World No. 1 (20%): A player's time at the top of the official rankings is a direct reflection of sustained dominance. Since our goal is to identify the Greatest of All Time, this metric is fundamental.

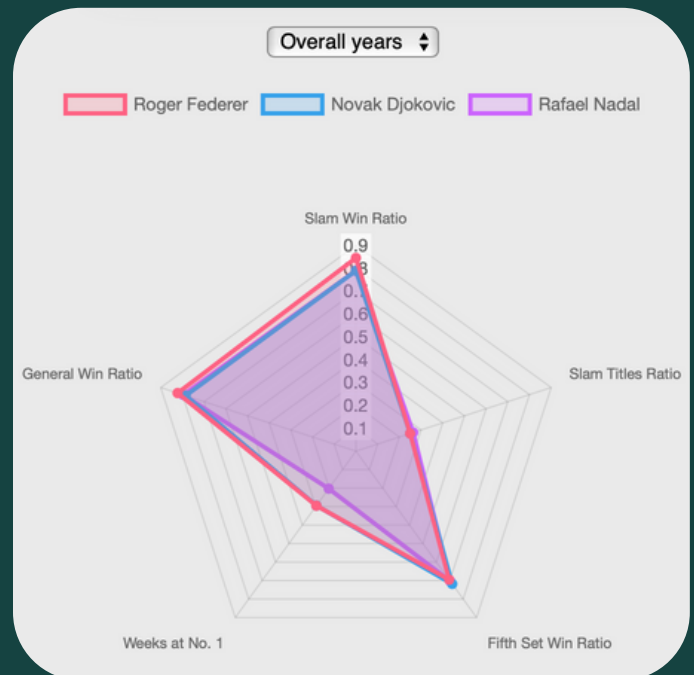
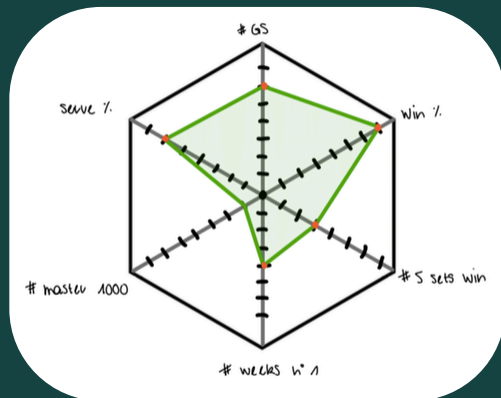
2) Overall Career Win Ratio (30%): Tennis is brutal at the professional level. Most players—even professionals—lose more matches than they win. That's why it's astonishing that GOAT contenders maintain career win rates above 80%. This stat captures the relentless consistency and quality required to stay ahead over an entire career.

3) Grand Slam Win Ratio (20%): Pressure peaks during Grand Slams—the biggest stages in tennis. This metric shows the percentage of Grand Slam matches a player has won, revealing their ability to thrive in the sport's most intense environments. It's a true marker of championship mentality.

4) Grand Slam Titles (10%): Often cited as the defining metric in GOAT debates, Grand Slam titles carry immense prestige. Every tennis legend has at least one to their name, and the very best often have many. While it's not the only measure of greatness, it remains a crucial one.

5) Fifth-Set Win Ratio (20%): Few challenges in tennis test a player's endurance, resilience, and mental toughness like a five-set match. These extended battles—sometimes lasting over five hours—are the ultimate proving ground. Excelling in this context reflects not only talent but extraordinary grit and determination.

By combining these five metrics into a single, interactive visualization, we give users a transparent and intuitive way to understand our GOAT rankings—one that balances dominance, consistency, clutch performance, and mental toughness.



Let the Fans Decide – GOAT Race

The GOAT debate in tennis is anything but objective—it's deeply personal and stirs up strong emotions. People bring their own experiences, favorite matches, and personal heroes into the conversation, which is exactly what makes it so captivating.

To honor this passionate subjectivity, we wanted to give our users a voice. That's why we created an **interactive voting system**, allowing everyone to cast their vote for who they believe is the true Greatest of All Time in tennis.

As the votes come in, a **dynamic race bar chart** comes to life—visually representing the fan-driven race to the top. Each player moves forward **in real time**, fuelled by the support of voters, turning data into a cheering crowd for their favorite legends.

This visualisation celebrates not just statistics, but the **collective passion of the tennis community**.

Choose your GOAT arena

All players (mixed)

Men

Women

Type player name or pick from the list

Player name, number of votes

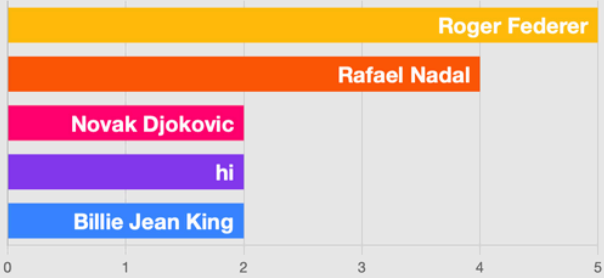
You do not agree with the above ranking ? Vote for your GOAT!

All Players

Select a Player

Vote 🏆

Let the users vote



PEER ASSESSMENT

Réza Machraoui

1. Took care of the global GOAT part (data loading for podium & bubble chart, spider chart setup with data loading + write the textual part)
2. Visual (non-working buttons) of the voting system
3. Took care of the tournament GOAT part (data loading for podium & bubble chart)

Luna Ralet

1. Took care of the Service, Net, and Surface category (data loading for podium & bubble charts)

Leila Sidjanski

1. Took care of the Double section (data loading for podium & bubble chart)
2. Visual of the background and designs of the website

While we divided the tasks among different group members, we collaborated closely throughout the project. This explains the significant number of merge commits in our repository. :)