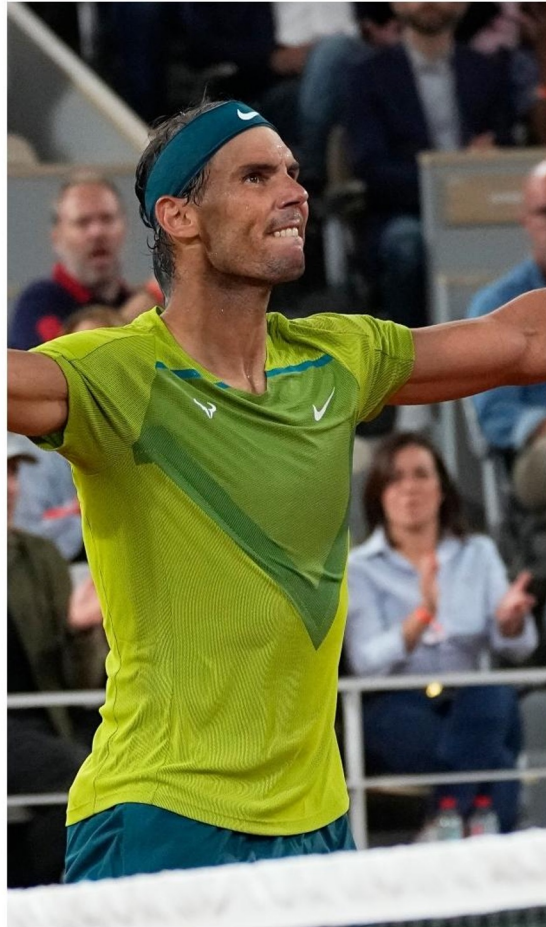


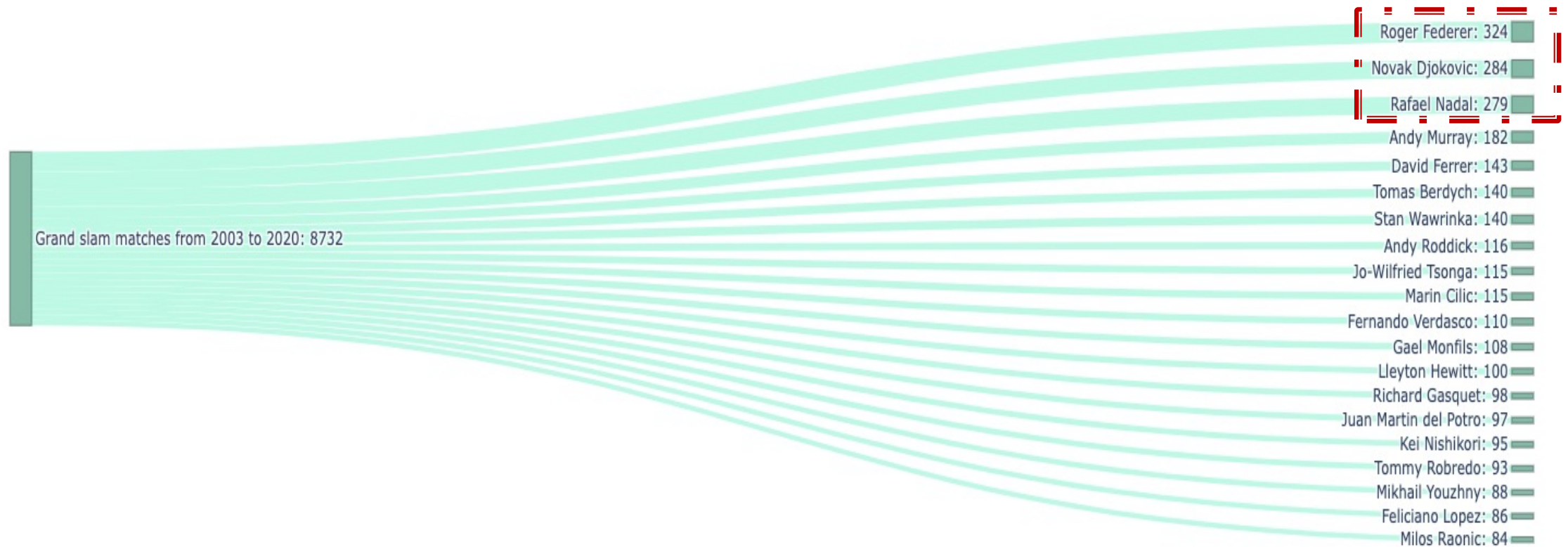
The Magic of the Big Three in Tennis

Group 12
Gokul
Rounak
Chenang
Junhua
Haoyu



Dominance

Distribution of Grand Slam match winners (top 20)



We want to answer

Why do the Big 3 dominate the game?



Difference between the Big 3 and other players



Does a rising star exist in the next generation?

Dataset

https://github.com/JeffSackmann/tennis_atp

ATP Tennis Rankings, Results, and Stats

NumPy 

 pandas

Example Columns

Match Stats 2003-2020



Player



Ranking 2010-2022

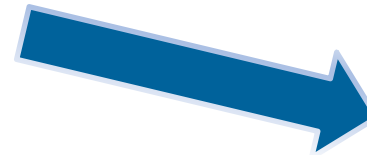
minutes	w_ace	...	w_bpSaved	w_bpFaced	l_ace	l_df
124.0	8.0	...	1.0	1.0	3.0	2.0
225.0	20.0	...	12.0	12.0	12.0	0.0
119.0	15.0	...	0.0	1.0	6.0	10.0
179.0	10.0	...	4.0	6.0	13.0	4.0
238.0	10.0	...	3.0	5.0	17.0	6.0

Methodology

Match Length



Serving Skills



Mental Toughness



Rising Star



Methodology

Match Length

Winner with less match time
Loser with longer match time

Serving Skills

Less double fault
More serve win

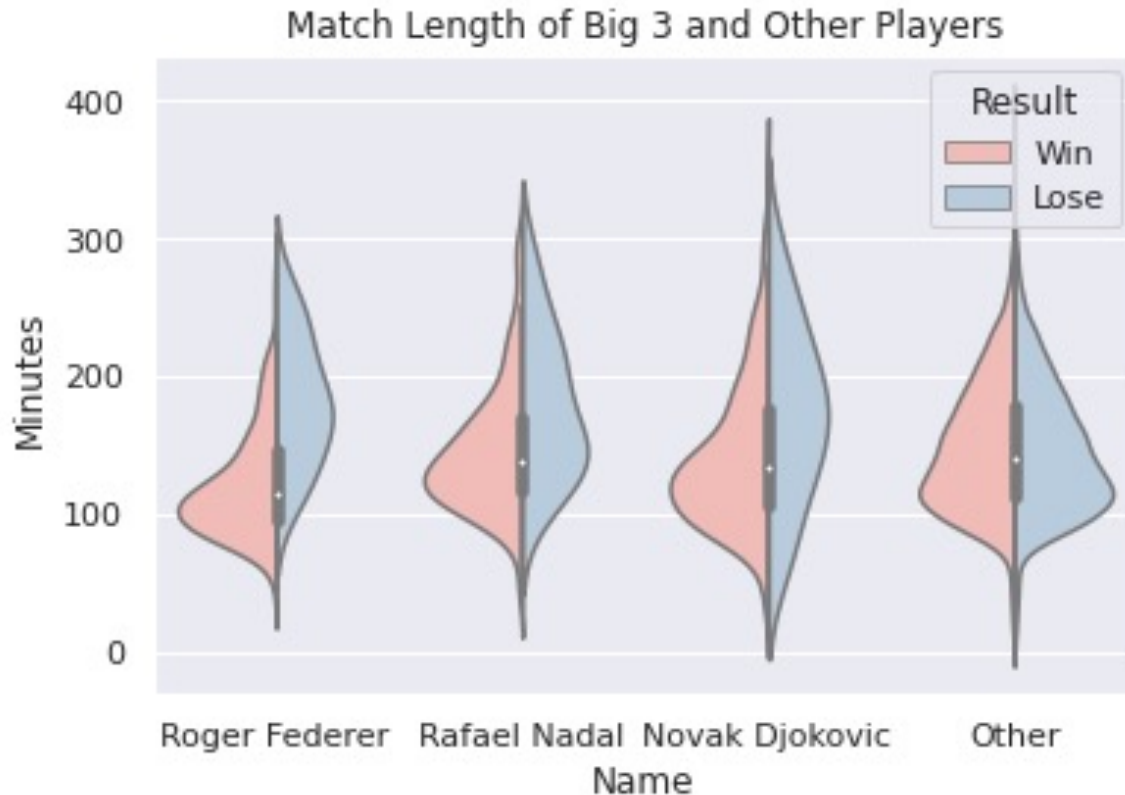
Mental Toughness

More break points

Rising Star

Similar performance
Younger age

Match length



Big 3

Win match length



Lose match length



Other

Win match length

||

Lose match length

Serving Skills

Correlation between ace and double fault



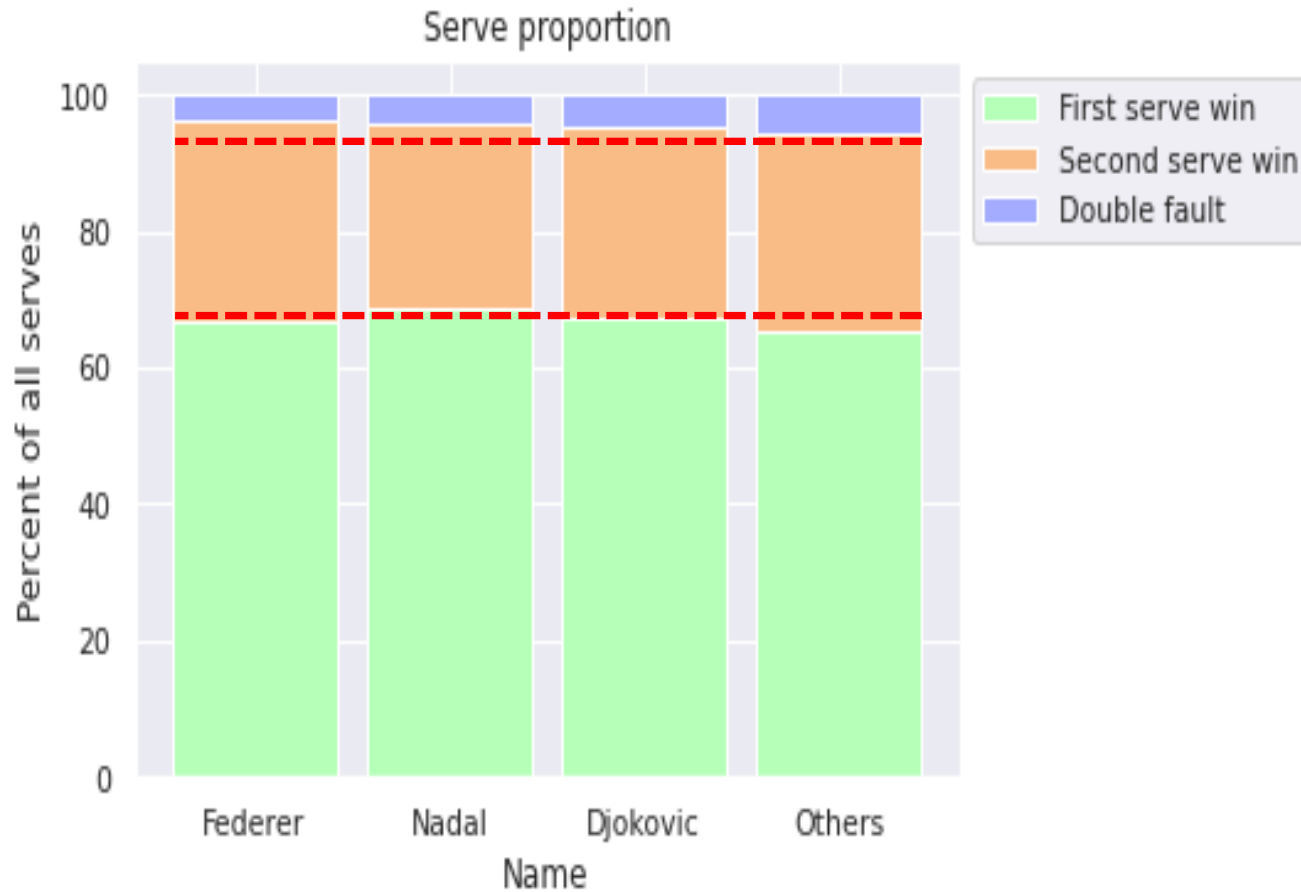
Ace

Federer > Djokovic > Nadal

Double Fault $\approx 3\%$

Federer \approx Djokovic \approx Nadal

Serving Skills

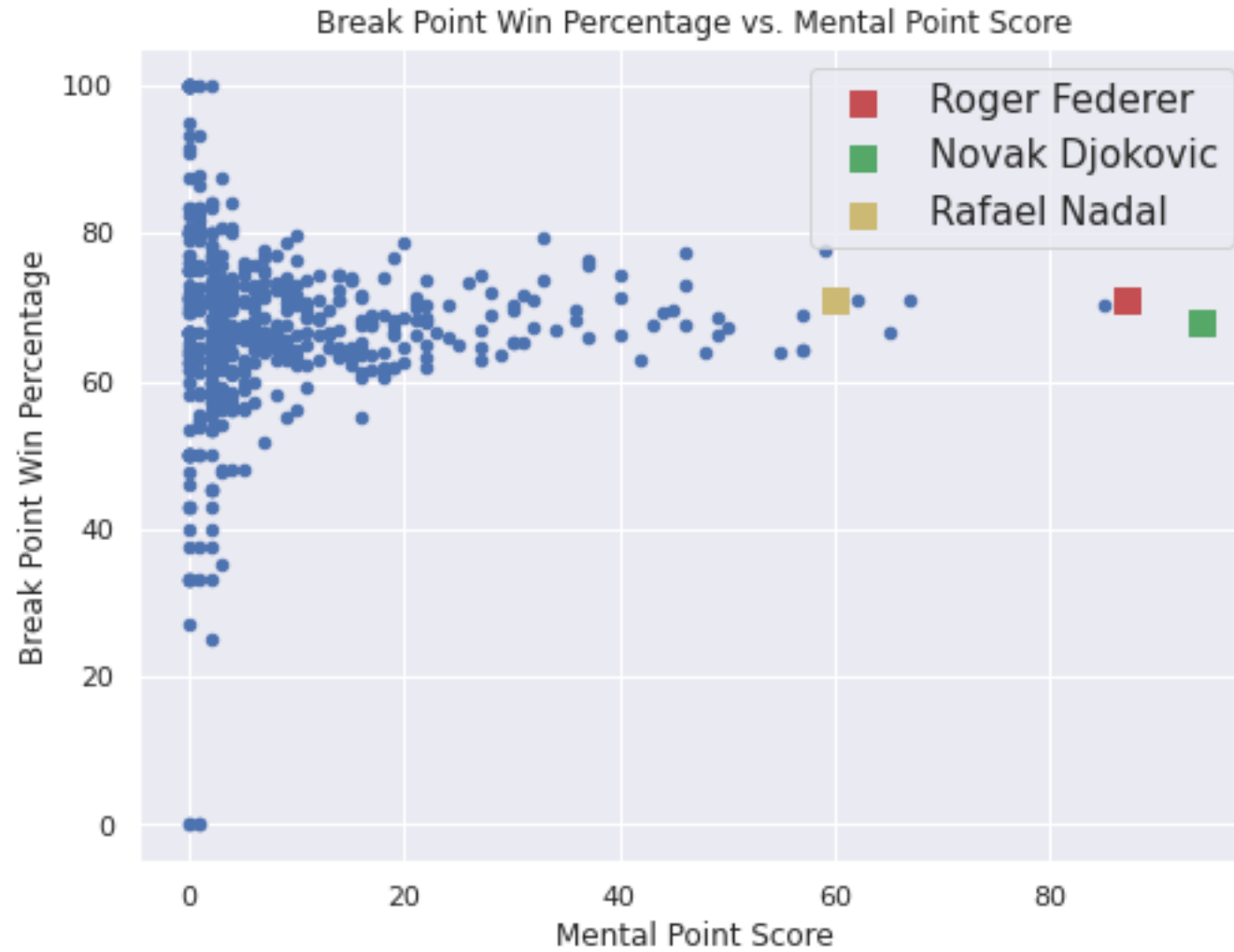


Less Double Fault
Better basic serving skills

More First serve win
Player confidence
Opponent Pressure



Mental Toughness



Score Calculation

Match Length

$$\frac{(Lose - Win) - \min(Lose - Win)}{\max(Lose - Win) - \min(Lose - Win)}$$

Serving Skills

$$1st\ win + 0.75 \times 2nd\ win - 2\ DF$$

Mental Toughness

$$2 * (5\ setters\ won) + 4 * (deciding\ tie\ breakers) + 0.5 (non\ deciding\ tie\ breakers)$$

Calculation

Big 3 each

Other player average



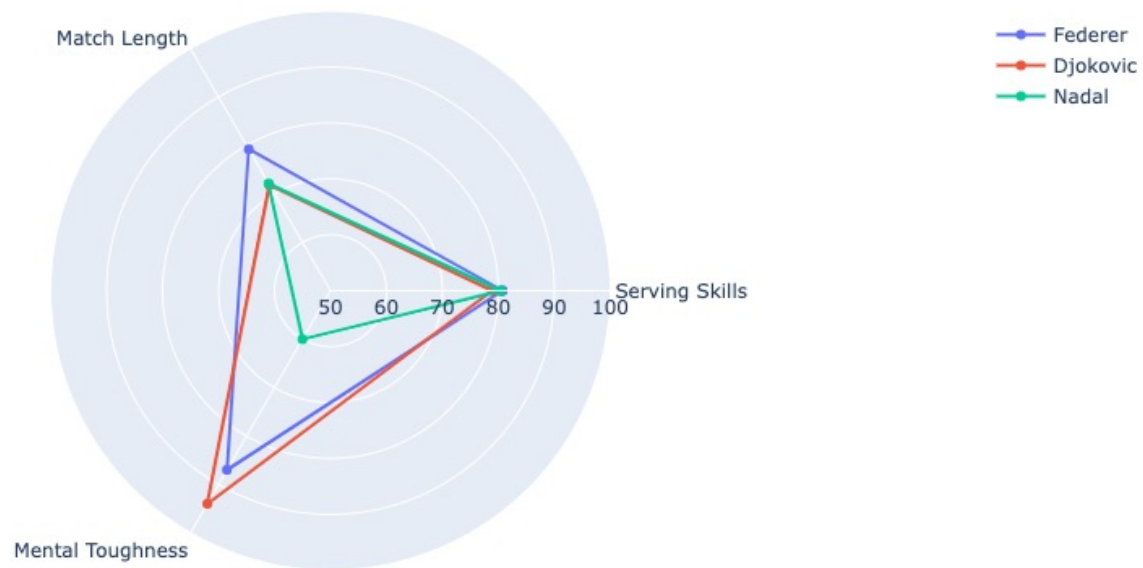
Comparison

Big 3 “Gap” Others

Which matters most

Rising Star

Big 3



Other player average



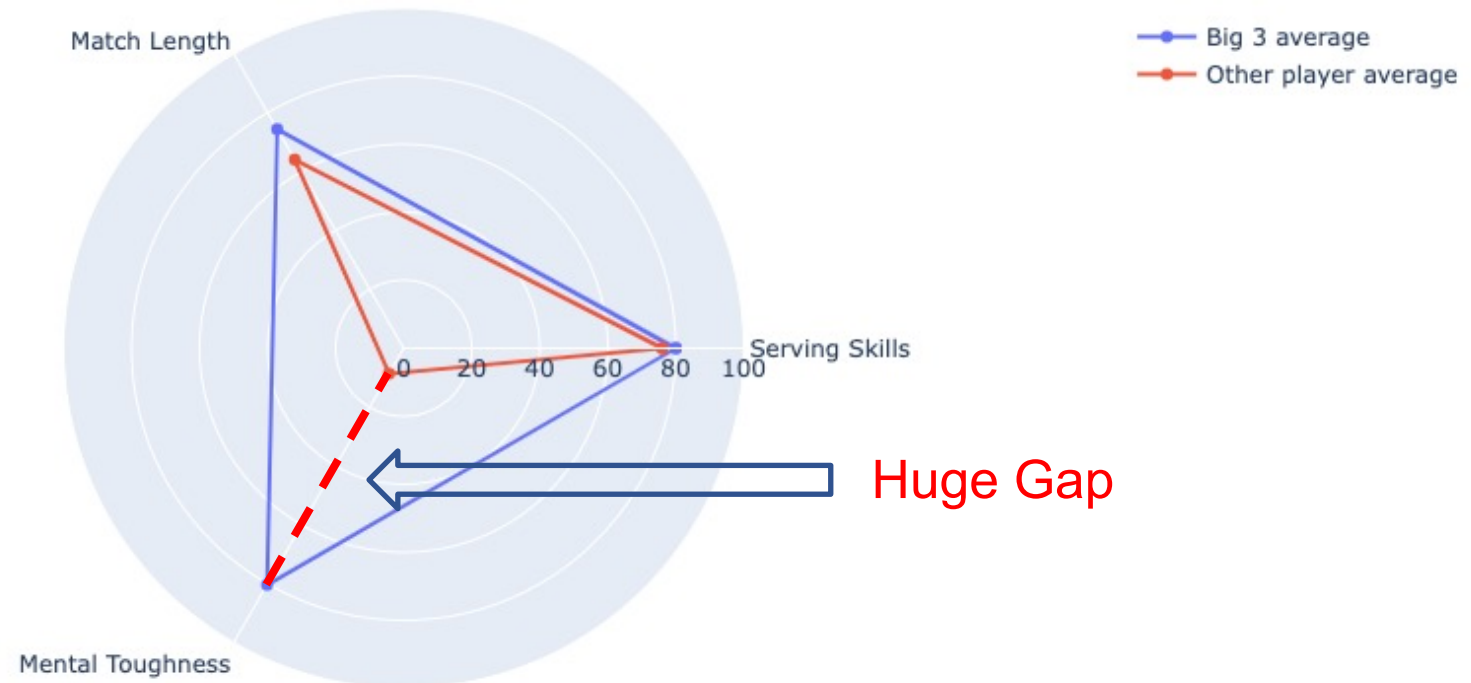
Match Length & Serving Skills \approx
Mental Toughness “Nadal”

Mental Toughness



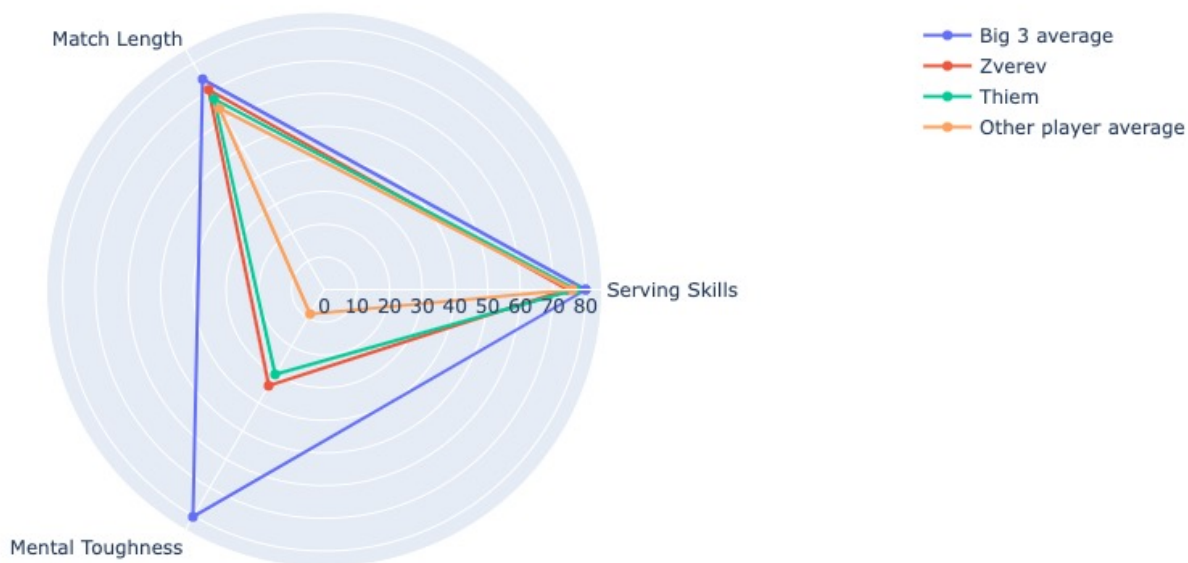
Rising Star

Big 3 average VS Other player average

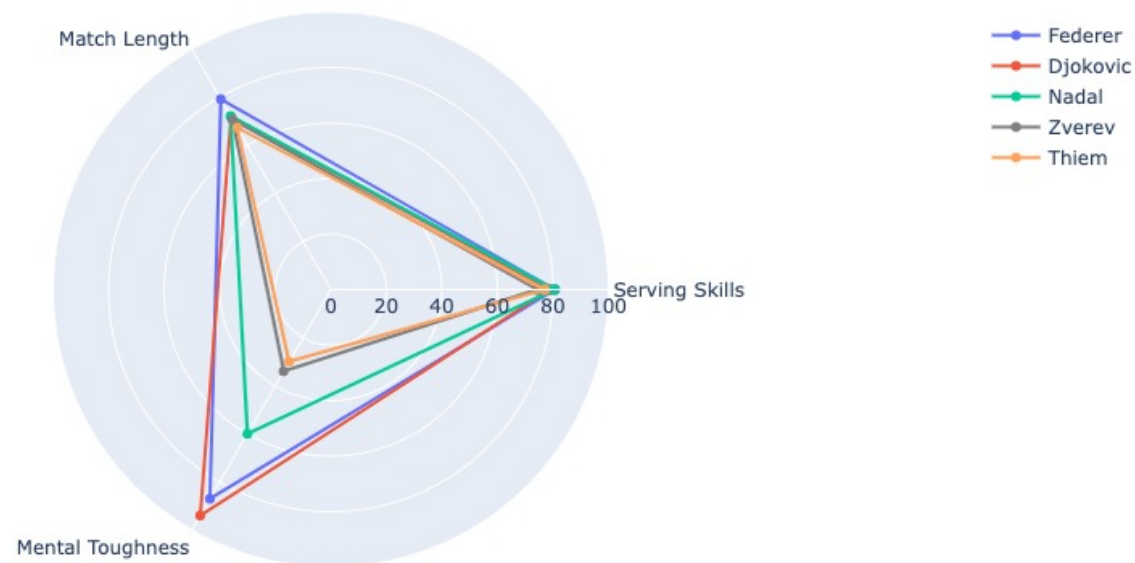


Rising Star

Big 3 average VS Rising Star VS Other player average



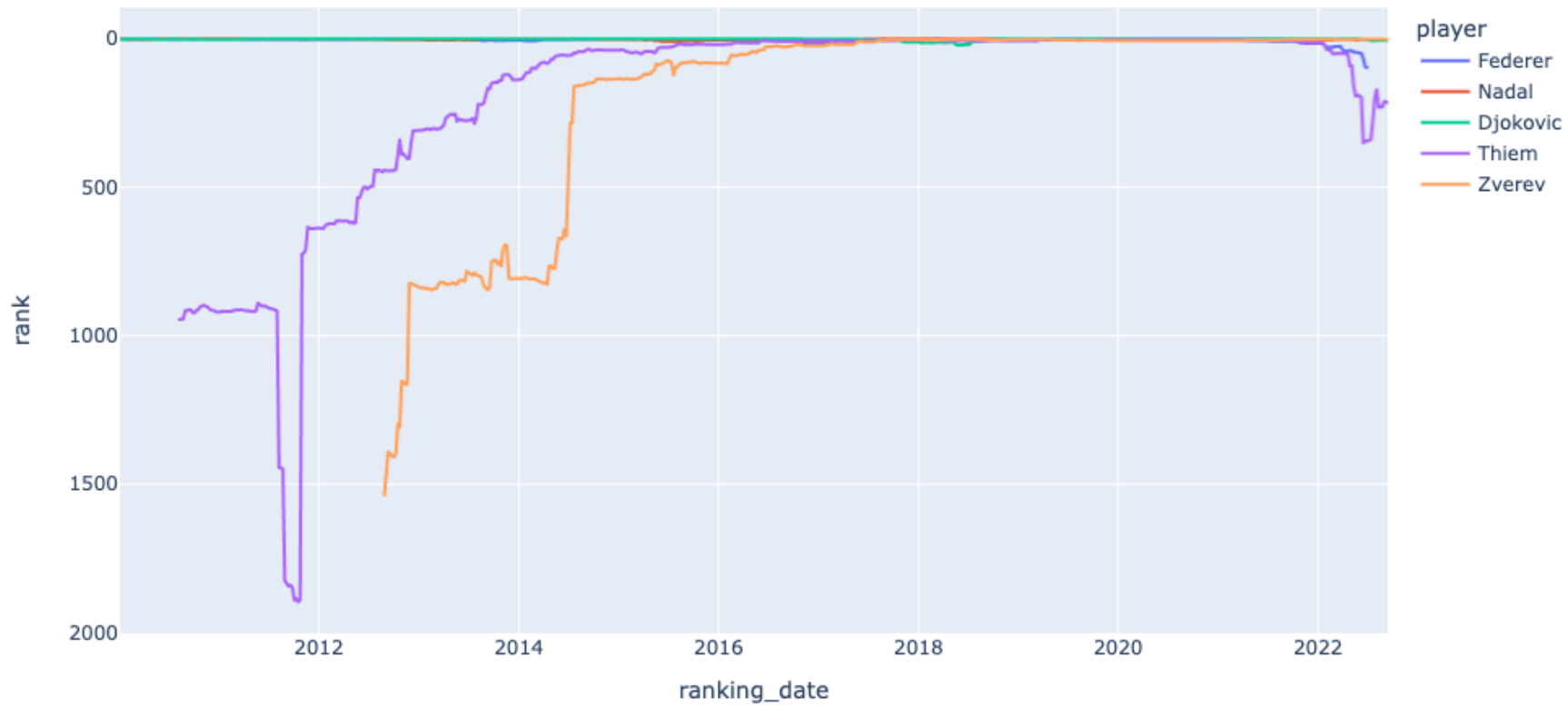
Big 3 VS Rising Star



Rank Mental Toughness ➡ First 2 players' age < 30

Rising Star

Big 3 VS Rising Star Ranking



Conclusion

1. Mental toughness is the key to being a great tennis player
2. The Big 3 have better performance in all 3 categories → Dominance
3. Zverev & Thiem → Rising Star (Need more experience to be tougher)

Future Steps

1. Predict the ranking and performance of the rising star
2. Consider more factors into our analysis (height, surface, handedness, injuries)
3. Use more accurate methods to generate the scores in distinct aspects

Reference

1. <https://towardsdatascience.com/understanding-the-importance-of-first-serve-in-tennis-with-data-analysis-4829ab088d36>
2. https://terra-docs.s3.us-east-2.amazonaws.com/IJHSR/Articles/volume3-issue5/2021_35_p50_Sridhara.pdf
3. <https://www.ultimatetennisstatistics.com/mentalToughness>

Repository

1. <https://github.com/RounakSen225/the-big-three-in-tennis>

Thanks for listening
Q&A