

1 Into the UFC: Best Fighter, Striker, Grappler, and Entertainer

2 Stanley Go¹

3 ¹ Rutgers University

4 Author Note

5 Add complete departmental affiliations for each author here. Each new line herein
6 must be indented, like this line.

7 Enter author note here.

8 The authors made the following contributions. Stanley Go: Conceptualization,
9 Writing - Original Draft Preparation, Writing - Review & Editing.

10 Correspondence concerning this article should be addressed to Stanley Go, Postal
11 address. E-mail: smg421@scarletmail.rutgers.edu

Abstract

This project delves into an in-depth analysis of UFC fighter statistics to identify and recognize excellence in various performance categories. The primary objective is to pinpoint the best fighters in distinct areas such as striking, grappling, knockout ability, and overall entertainment value. The study further aims to determine the greatest of all time (GOAT) by evaluating fighters based on their win-loss ratios. Leveraging a comprehensive dataset encompassing fighter metrics, the analysis employs key indicators such as significant strikes rate, takedown success rate, and total knockdowns. The anticipated results include detailed insights into the best striker, grappler, KOer, and entertainer, contributing to a comprehensive understanding of individual strengths within the competitive realm of UFC. Additionally, the study seeks to establish the GOAT by considering the historical performance of fighters with a minimum threshold of 10 matches. Through meticulous analysis and visualization, this project aims to offer a nuanced perspective on the unparalleled skills and accomplishments of UFC fighters across diverse categories.

Keywords: Best, GOAT, Fighter, Performance, UFC

Word count: 160

Into the UFC: Best Fighter, Striker, Grappler, and Entertainer

#Introduction:

- Background:

- Brief overview of the UFC and its significance in the world of mixed martial arts (MMA).
- Growing interest in understanding and analyzing fighter performance.

- Research Focus:

- Exploration of UFC fighter statistics to recognize excellence in various performance categories.

- Big Question:

- The Ultimate Fighting Championship (UFC) hosts a wide range of fighters with diverse skill sets, including striking, grappling, and entertainment value. The objective of this project is to systematically analyze UFC fighter data to determine who excels in each category, identify the best overall fighters, and predict fight outcomes and potential earnings. We will aim our analysis to provide insights into fighter performance, audience appeal, and financial success within the UFC.

- Objectives:

- Identification of the best fighters in specific areas:
 - * Best Striker
 - * Best Grappler
 - * Best KOer
 - * Best Entertainer

- Key Questions:

– Research questions guiding the analysis:

* Who are the best strikers, grapplers, and KOers in UFC?

* What factors contribute to a fighter’s entertainment value?

* Who is considered the greatest of all time in UFC?

- Data Source:

– Utilization of the UFC Stats dataset with a comprehensive set of fighter metrics.

- Methodology:

– Planned analysis includes calculating key metrics such as significant strikes rate, takedown success rate, and total knockdowns.

- Anticipated Results:

– Expected outcomes involve insights into the best performers in each category, contributing to a nuanced understanding of individual strengths.

- Significance:

– Emphasis on the significance of recognizing and appreciating excellence within the competitive realm of UFC.

- Overview of the Document:

– Brief mention of the subsequent sections, including the methodology, results, and discussion.

Methods

Data Collection

- Data Source:

- Utilize the UFC Stats dataset, containing comprehensive fighter metrics, including but not limited to knockdowns, significant strikes, takedowns, and fight outcomes.

Analysis Approach

1. Identifying Best Striker:

- Calculate the significant strikes rate for each fighter:

$$\text{Significant Strikes Rate} = \frac{\text{Total Significant Strikes Landed}}{\text{Total Significant Strikes Attempted}}$$

- Determine the fighter with the highest significant strikes rate as the best striker.

2. Identifying Best Grappler:

- Compute the takedown success rate for each fighter:

$$\text{Takedown Success Rate} = \frac{\text{Total Successful Takedowns}}{\text{Total Takedown Attempts}}$$

- Identify the fighter with the highest takedown success rate as the best grappler.

3. Identifying Best KOer:

- Sum the total knockdowns for each fighter.
- Determine the fighter with the highest total knockdowns as the best KOer.

4. Identifying Best Entertainer:

- Develop a composite metric considering both significant strikes and successful takedowns.
- Determine the fighter with the highest composite metric as the best entertainer.

5. Determining Greatest of All Time (GOAT):

- Filter fighters with a minimum threshold of 10 matches.

- Calculate the win-loss ratio for each fighter:

$$\text{Win-Loss Ratio} = \frac{\text{Total Wins}}{\text{Total Wins} + \text{Total Losses}}$$

- Identify the fighter with the highest win-loss ratio as the GOAT.

Visualization

- **Figure Creation:**

- Develop bar plots for each category (Best Striker, Best Grappler, Best KOer, Best Entertainer, and GOAT) to visually represent the analysis results.

Limitations

- **Limitations of the Analysis:**

- Acknowledge potential limitations such as data accuracy, sample size variations, and the subjectivity of composite metrics.

Ethical Considerations

- **Ethical Considerations:**

- Ensure the privacy and consent of fighters in the analysis.
- Avoid biased interpretations and represent results objectively.

Participants

Material

Procedure

Data analysis

We used R (Version 4.3.1; R Core Team, 2023) and the R-packages *dplyr* (Version 1.1.3; Wickham, François, Henry, Müller, & Vaughan, 2023), *forcats* (Version 1.0.0;

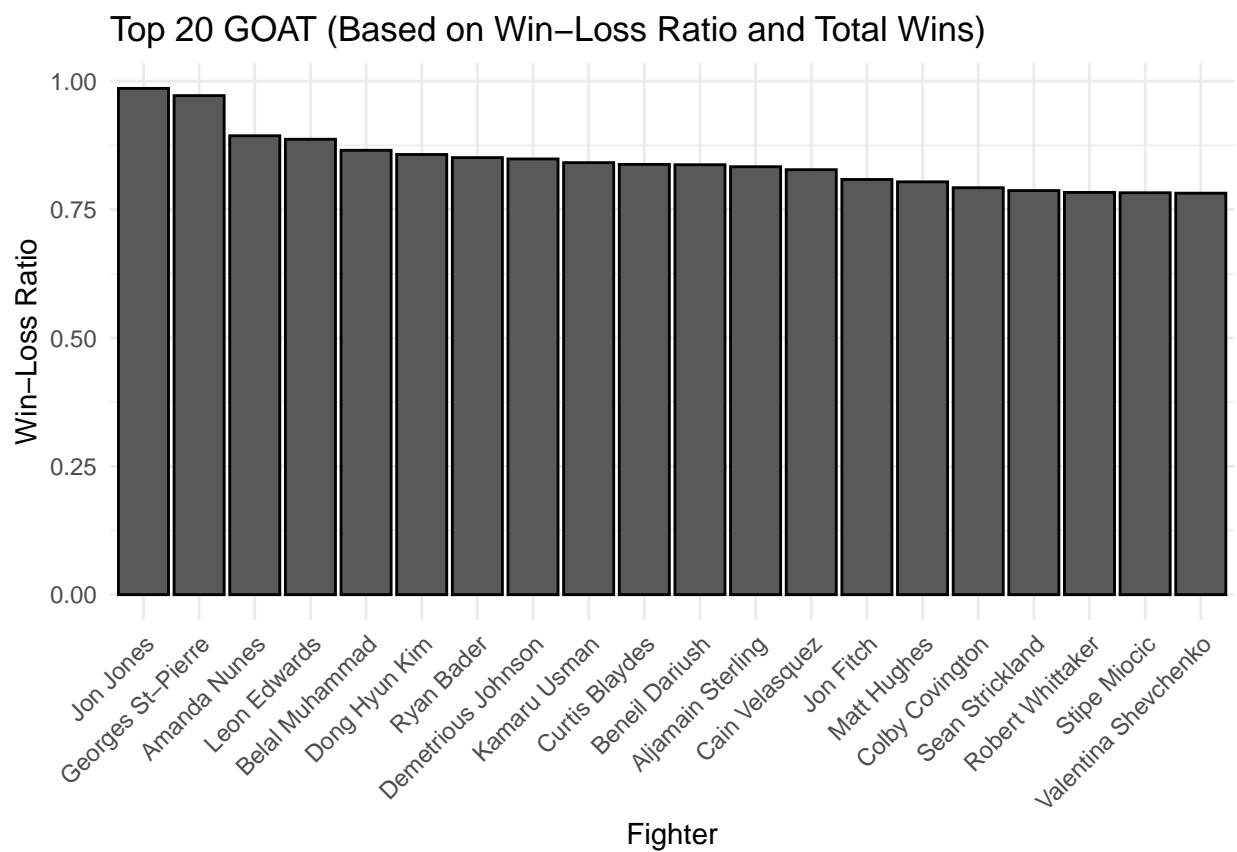
Wickham, 2023), *ggplot2* (Version 3.4.3; Wickham, 2016), *lubridate* (Version 1.9.2; Grolemund & Wickham, 2011), *papaja* (Version 0.1.2; Aust & Barth, 2023), *purrr* (Version 1.0.2; Wickham & Henry, 2023), *readr* (Version 2.1.4; Wickham, Hester, & Bryan, 2023), *stringr* (Version 1.5.0; Wickham, 2022), *tibble* (Version 3.2.1; Müller & Wickham, 2023), *tidyr* (Version 1.3.0; Wickham, Vaughan, & Girlich, 2023), *tidyverse* (Version 2.0.0; Wickham et al., 2019), and *tinylabels* (Version 0.2.4; Barth, 2023) for all our analyses.

Results

Planned Analysis

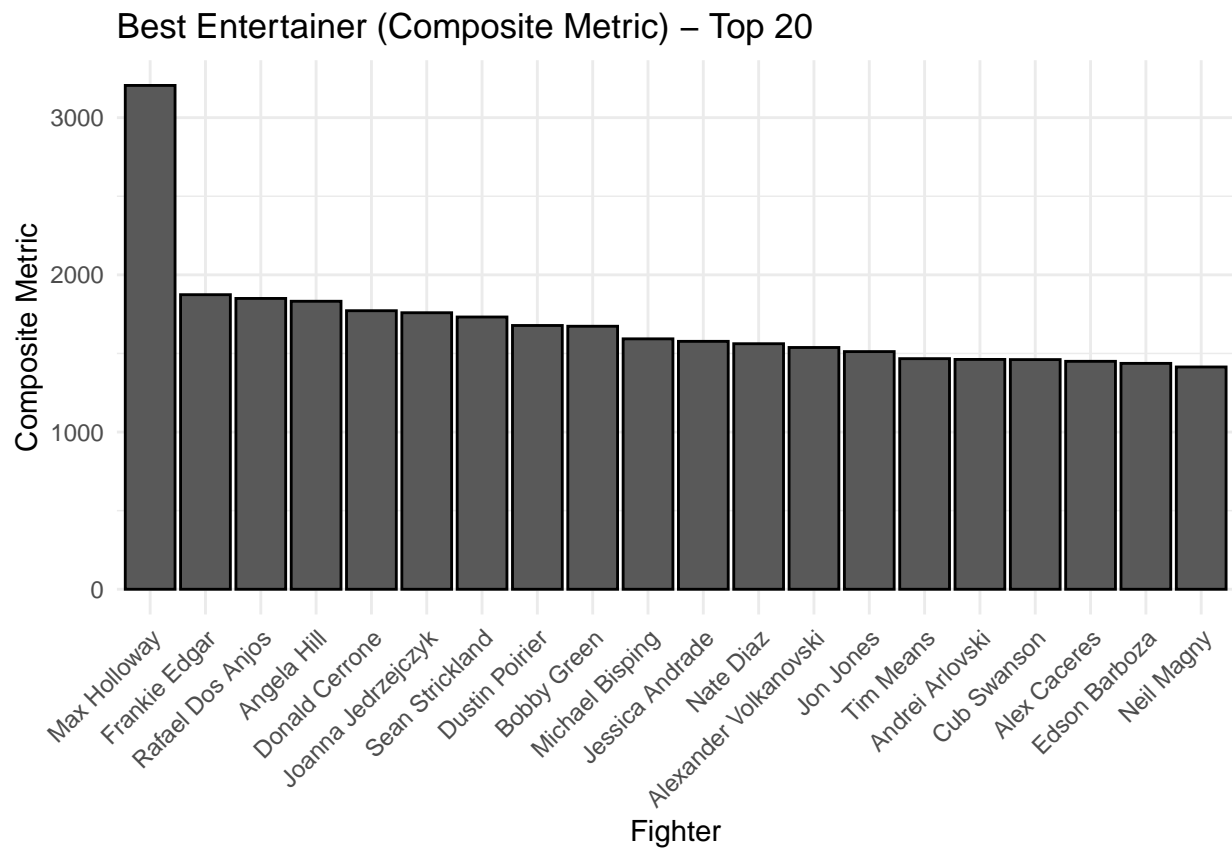
Our analysis focused on several key aspects of UFC fighter performance, including:

- **Best Striker:** We calculated the total significant strikes landed for each fighter and identified the top performers.
- **Best Grappler:** Utilizing the grappling efficiency metric, we determined the fighters with the highest success rate in takedowns.
- **Best KOer:** We considered knockdowns, significant strikes, and other metrics to identify fighters with exceptional knockout abilities.
- **Best Entertainer:** A composite metric, combining significant strikes, takedowns, and knockdowns, helped us identify fighters who entertain the audience.
- **Best PPV Seller:** We calculated the average PPV revenue per fight for each fighter, focusing on financial success.
- **Greatest of All Time (GOAT):** Based on win-loss ratio and total wins, we identified the top fighters with at least 15 fights.

133 **Planned Figure and Table**134 *Figure: Top 20 GOAT (Win-Loss Ratio and Total Wins)*

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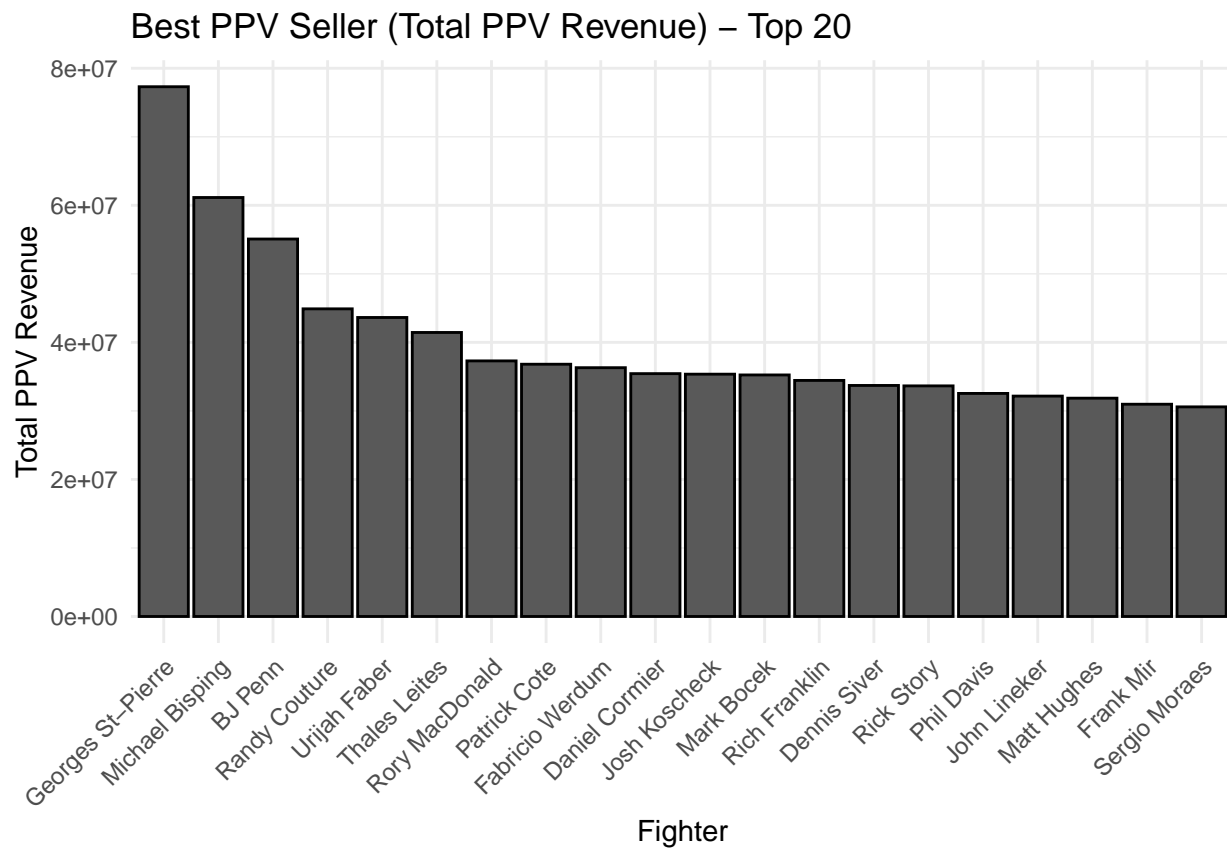
136 *Figure: Top 20 Entertainers*



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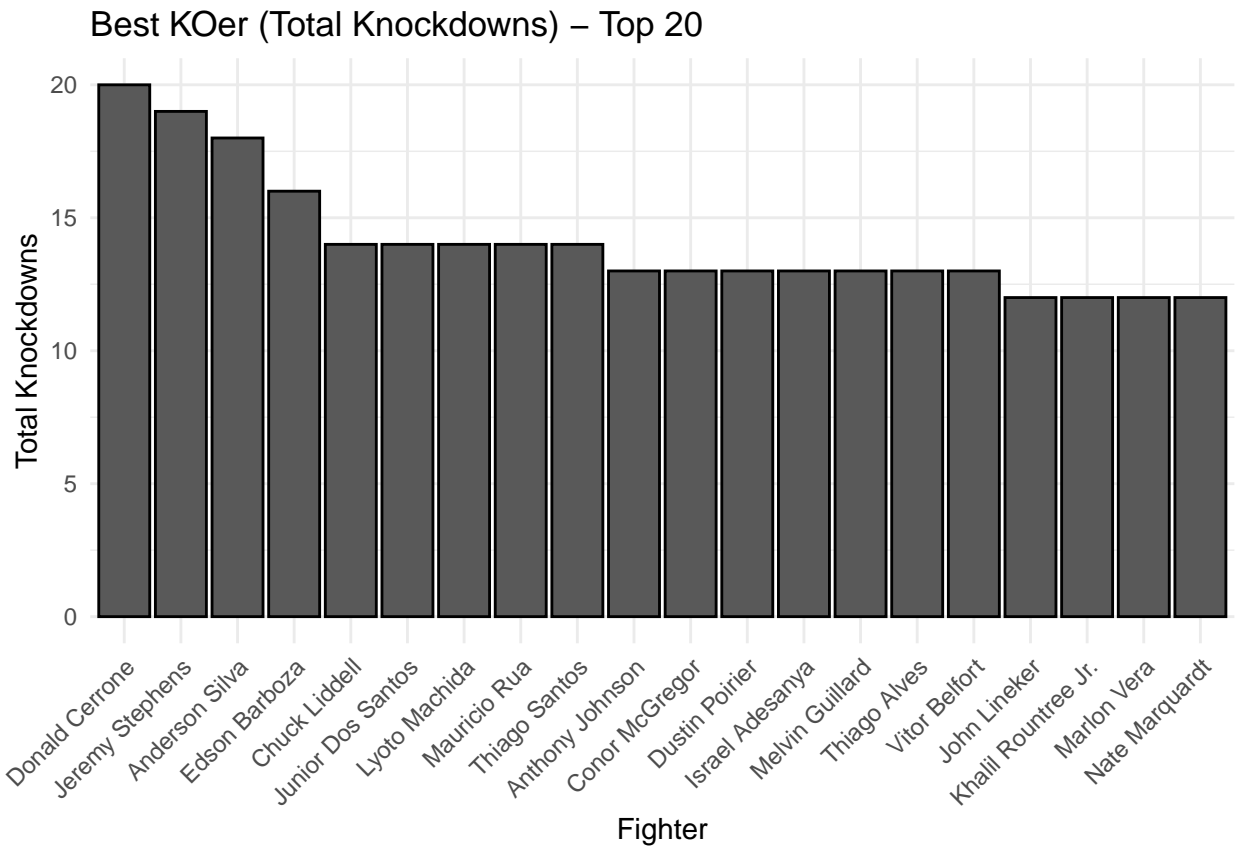
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Figure: Top 20 PPV Seller



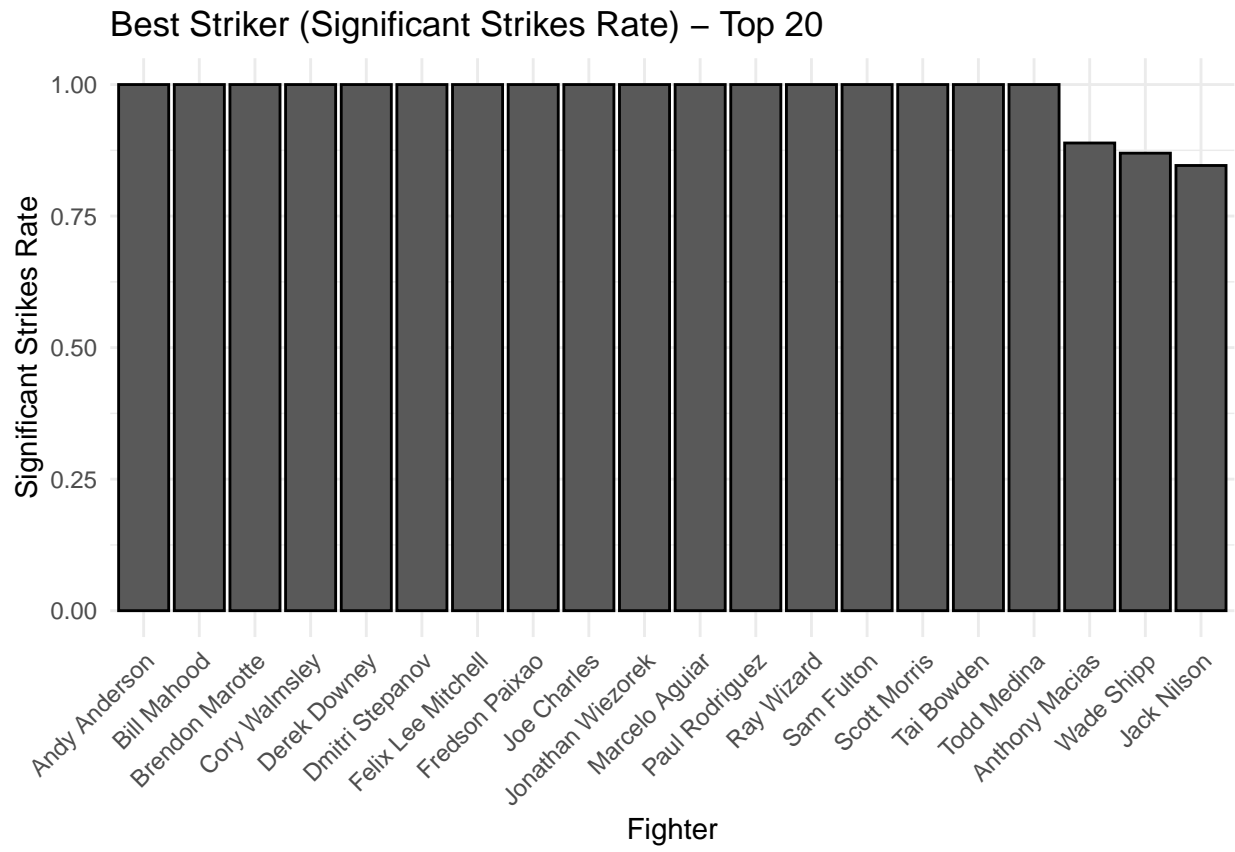
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140 *Figure: Top 20 Koer*



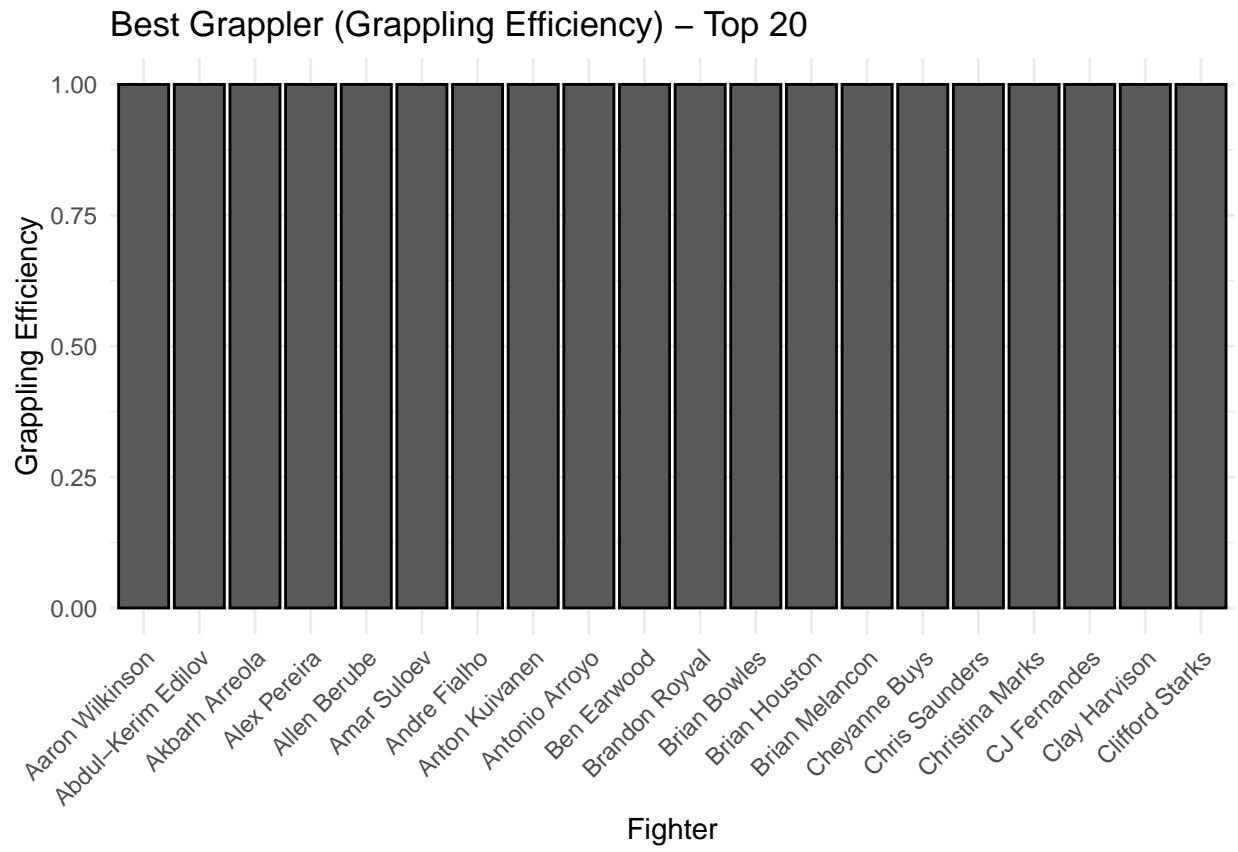
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142 *Figure: Top 20 Striker*



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144 *Figure: Top 20 Grapplers*



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Table KOer

| fighter | total_knockdowns |
|---------------------|------------------|
| Donald Cerrone | 20 |
| Jeremy Stephens | 19 |
| Anderson Silva | 18 |
| Edson Barboza | 16 |
| Chuck Liddell | 14 |
| Junior Dos Santos | 14 |
| Lyoto Machida | 14 |
| Mauricio Rua | 14 |
| Thiago Santos | 14 |
| Anthony Johnson | 13 |
| Conor McGregor | 13 |
| Dustin Poirier | 13 |
| Israel Adesanya | 13 |
| Melvin Guillard | 13 |
| Thiago Alves | 13 |
| Vitor Belfort | 13 |
| John Lineker | 12 |
| Khalil Rountree Jr. | 12 |
| Marlon Vera | 12 |
| Nate Marquardt | 12 |

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Table Striker

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| fighter | striking_efficiency |
|-----------------|---------------------|
| Andy Anderson | 1 |
| Bill Mahood | 1 |
| Brendon Marotte | 1 |
| Cory Walmsley | 1 |
| Derek Downey | 1 |
| Dmitri Stepanov | 1 |

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Table for Grappler

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| fighter | grappling_efficiency |
|--------------------|----------------------|
| Aaron Wilkinson | 1 |
| Abdul-Kerim Edilov | 1 |
| Akbarh Arreola | 1 |
| Alex Pereira | 1 |
| Allen Berube | 1 |
| Amar Suloev | 1 |

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Table for PPV Seller

| fighter | total_ppv_revenue |
|-------------------|-------------------|
| Georges St-Pierre | 77302574 |
| Michael Bisping | 61136589 |
| BJ Penn | 55079938 |
| Randy Couture | 44891237 |
| Urijah Faber | 43629287 |
| Thales Leites | 41445831 |
| Rory MacDonald | 37295483 |
| Patrick Cote | 36811364 |
| Fabricio Werdum | 36304568 |
| Daniel Cormier | 35437113 |
| Josh Koscheck | 35358286 |
| Mark Bocek | 35245685 |
| Rich Franklin | 34447098 |
| Dennis Siver | 33712580 |
| Rick Story | 33650671 |
| Phil Davis | 32550334 |
| John Lineker | 32160399 |
| Matt Hughes | 31857809 |
| Frank Mir | 30972597 |
| Sergio Moraes | 30588181 |

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Table for Entertainer

| fighter | entertainment_metric |
|-----------------------|----------------------|
| Max Holloway | 3205 |
| Frankie Edgar | 1874 |
| Rafael Dos Anjos | 1850 |
| Angela Hill | 1832 |
| Donald Cerrone | 1772 |
| Joanna Jedrzejczyk | 1759 |
| Sean Strickland | 1732 |
| Dustin Poirier | 1678 |
| Bobby Green | 1673 |
| Michael Bisping | 1593 |
| Jessica Andrade | 1577 |
| Nate Diaz | 1562 |
| Alexander Volkanovski | 1538 |
| Jon Jones | 1512 |
| Tim Means | 1467 |
| Andrei Arlovski | 1462 |
| Cub Swanson | 1461 |
| Alex Caceres | 1450 |
| Edson Barboza | 1437 |
| Neil Magny | 1414 |

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Table for the GOAT

| fighter | total_wins | total_losses | total_fights | win_loss_ratio |
|----------------------|------------|--------------|--------------|----------------|
| Jon Jones | 70 | 1 | 23 | 0.99 |
| Georges St-Pierre | 69 | 2 | 22 | 0.97 |
| Amanda Nunes | 42 | 5 | 18 | 0.89 |
| Leon Edwards | 47 | 6 | 16 | 0.89 |
| Belal Muhammad | 45 | 7 | 18 | 0.87 |
| Dong Hyun Kim | 36 | 6 | 18 | 0.86 |
| Ryan Bader | 40 | 7 | 20 | 0.85 |
| Demetrious Johnson | 56 | 10 | 18 | 0.85 |
| Kamaru Usman | 53 | 10 | 17 | 0.84 |
| Curtis Blaydes | 31 | 6 | 17 | 0.84 |
| Beneil Dariush | 36 | 7 | 22 | 0.84 |
| Aljamain Sterling | 45 | 9 | 19 | 0.83 |
| Cain Velasquez | 24 | 5 | 15 | 0.83 |
| Jon Fitch | 38 | 9 | 18 | 0.81 |
| Matt Hughes | 41 | 10 | 25 | 0.80 |
| Colby Covington | 42 | 11 | 15 | 0.79 |
| Sean Strickland | 48 | 13 | 20 | 0.79 |
| Robert Whittaker | 47 | 13 | 20 | 0.78 |
| Stipe Miocic | 36 | 10 | 18 | 0.78 |
| Valentina Shevchenko | 43 | 12 | 16 | 0.78 |

Discussion

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