Grading NFL Defenders in Coverage Using Player Tracking Data
A Target-Agnostic Evaluation Method for Cornerbacks & Wide Receivers

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Goals

Quantify CB & WR performance on ALL routes

Find undervalued players

Optimize CB-WR matchups
Data

Game Data

Player Data (play position tag)

Player Tracking Data (x, y, speed, direction, orientation, event tag)

Play Data (down, distance, personnel, **EPA**)
Methodology

1. Predict Model Route Success (XGBoost)
2. Develop Player Ratings (ELO)
Route Success Classification Model

- **Model:** XGBoost
- **Output:** % Route Success
- **Accuracy:** 70.4%
Quinton Dunbar
CB, Washington

Davante Adams
WR, Green Bay

CB Win 50-50 WR Win
<table>
<thead>
<tr>
<th>Defensive Player</th>
<th>TAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephon Gilmore</td>
<td>1232.06</td>
</tr>
<tr>
<td>William Jackson</td>
<td>1191.08</td>
</tr>
<tr>
<td>Captain Munnerlyn</td>
<td>1170.95</td>
</tr>
<tr>
<td>Denzel Ward</td>
<td>1158.11</td>
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<tr>
<td>Chidobe Awuzie</td>
<td>1141.88</td>
</tr>
<tr>
<td>Jason McCourty</td>
<td>1134.40</td>
</tr>
<tr>
<td>Carlton Davis</td>
<td>1131.76</td>
</tr>
<tr>
<td>Briean Boddy-Calhoun</td>
<td>1131.24</td>
</tr>
<tr>
<td>Logan Ryan</td>
<td>1130.89</td>
</tr>
<tr>
<td>Jalen Ramsey</td>
<td>1130.33</td>
</tr>
</tbody>
</table>

*Target Agnostic Player Elo*
Final Wide Receiver Rankings

2018 NFL Season

<table>
<thead>
<tr>
<th>Offensive Player</th>
<th>TAPE(^7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.Y. Hilton</td>
<td>1052.50</td>
</tr>
<tr>
<td>Odell Beckham</td>
<td>1049.31</td>
</tr>
<tr>
<td>Mike Evans</td>
<td>1040.38</td>
</tr>
<tr>
<td>Brandin Cooks</td>
<td>1040.33</td>
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<tr>
<td>A.J. Green</td>
<td>1038.11</td>
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<tr>
<td>Tyreek Hill</td>
<td>1031.35</td>
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<tr>
<td>Alshon Jeffery</td>
<td>1030.36</td>
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<tr>
<td>Chester Rogers</td>
<td>1024.37</td>
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<tr>
<td>Allen Robinson</td>
<td>1019.07</td>
</tr>
<tr>
<td>Julio Jones</td>
<td>1016.38</td>
</tr>
</tbody>
</table>

\(^7\) Elo Rating

Top 10 WR TAPE Ratings by Week
Finding Undervalued Players

Jaire Alexander
PFF Grade: 90.4 (#1)

Xavien Howard
PFF Grade: 87.3 (#2)

Bryce Callahan
PFF Grade: 84.1 (#3)

Jonathan Jones
PFF Grade: 80.7 (#5)

Ahkello Witherspoon
PFF Grade: 80.2 (#6)

James Bradberry
PFF Grade: 79.8 (#7)
Optimizing Matchups

Stephon Gilmore
TAPE: 1213.69

Jonathan Jones
TAPE: 1097.37

Stephon Gilmore
TAPE: 1213.69

Jonathan Jones
TAPE: 1097.37

Davante Adams
TAPE: 945.17

Randall Cobb
TAPE: 889.66

Davante Adams
TAPE: 945.17

Randall Cobb
TAPE: 889.66

OR

&

Gilmore: 82.43% Win
Jones: 76.78% Win

NE: 63.29% Win

&

Gilmore: 86.59% Win
Jones: 70.60% Win

NE: 61.13% Win
Conclusion

Our metric provides effective player evaluation

Teams can use this for game planning

Spatiotemporal data is an important predictor of route outcomes