Jalen Hurts 2024-25 Season:

Passing Profile Visualization

Nate Moser
INFSCI 1520 – Spring 2025

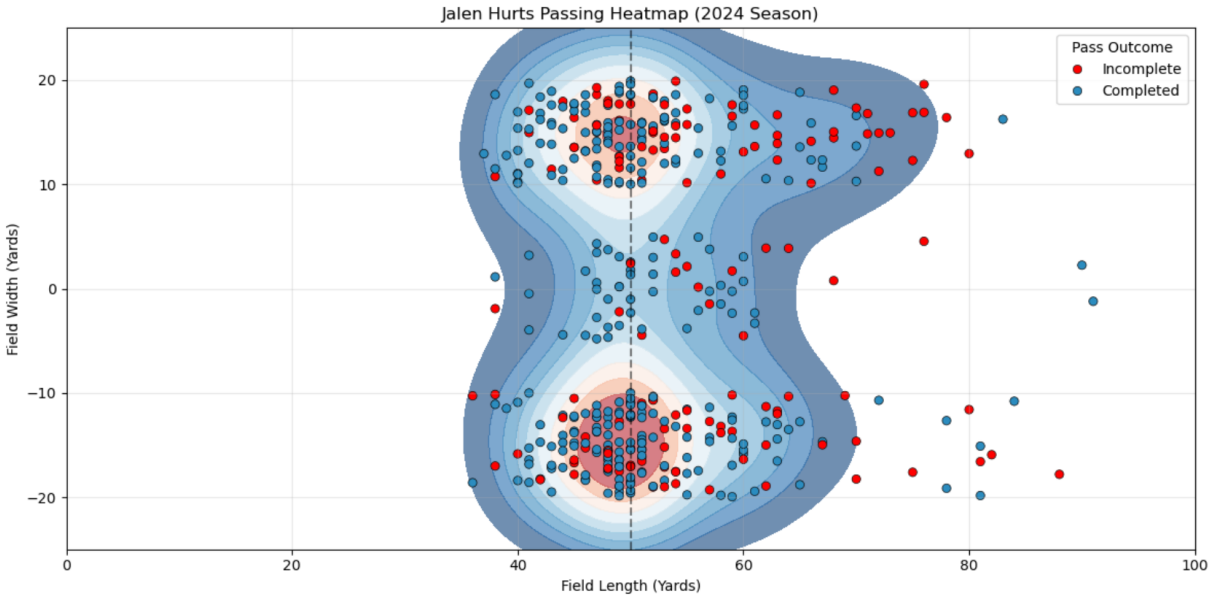

Figure 1: Spatial Density of Pass Distribution

Legend

- Field Length (X-axis): 0 (own end zone) to 100 yards (opponent's end zone)
- Field Width (Y-axis): Sideline-to-sideline, centered at 0
- Shaded KDE Zones: Blue/red gradient shows density of pass attempts (warmer = increasing volume)
- Dashed vertical lines mark: 10-yard line, midfield (50 yds), 90-yard line

Findings

- Hurts most frequently targeted the short-left and short-right areas
- Assuming LOS is at the 40, majority of Hurts' passes were within 0 – 15 air yards (IAY/PA)
- Many completions clustered in the short-middle zone
- Deep-right throws (landing 70+ yards downfield) occurred less often but had decent success

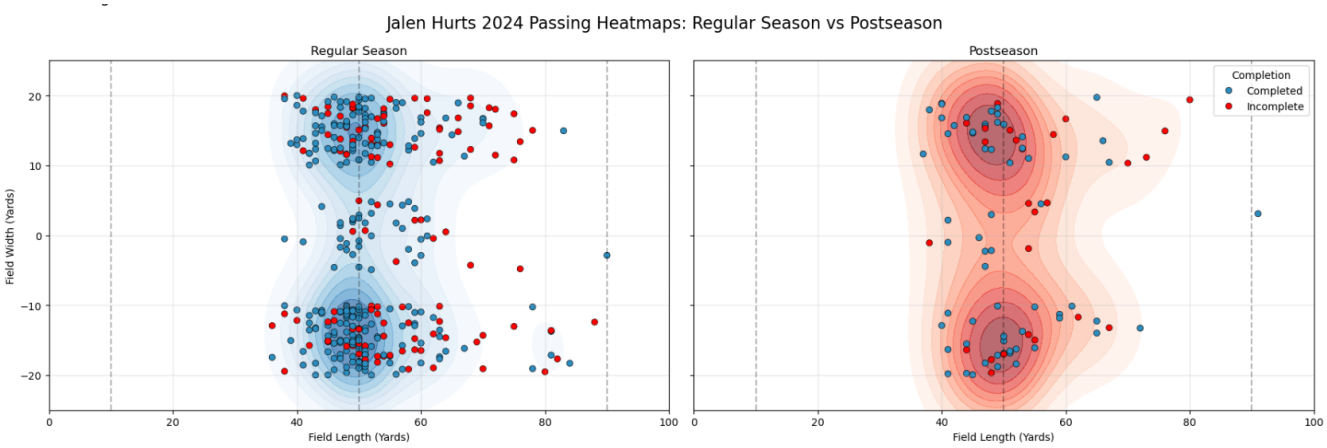

Figure 2: Pass Distribution Comparison – Regular Season vs Postseason

Legend

- KDE Heatmap: Shows pass location density
    - Blue shades = Higher pass frequency
    - Red shades = Higher pass frequency

Findings

- Hurts' short-left and short-right zones remained his most targeted areas in the postseason
- Despite the reduced volume, completion dots remained strong in high-frequency zones
- Explosive pass attempts down the field are almost entirely absent from the postseason plot, which may indicate play-calling conservatism or lack of opportunity

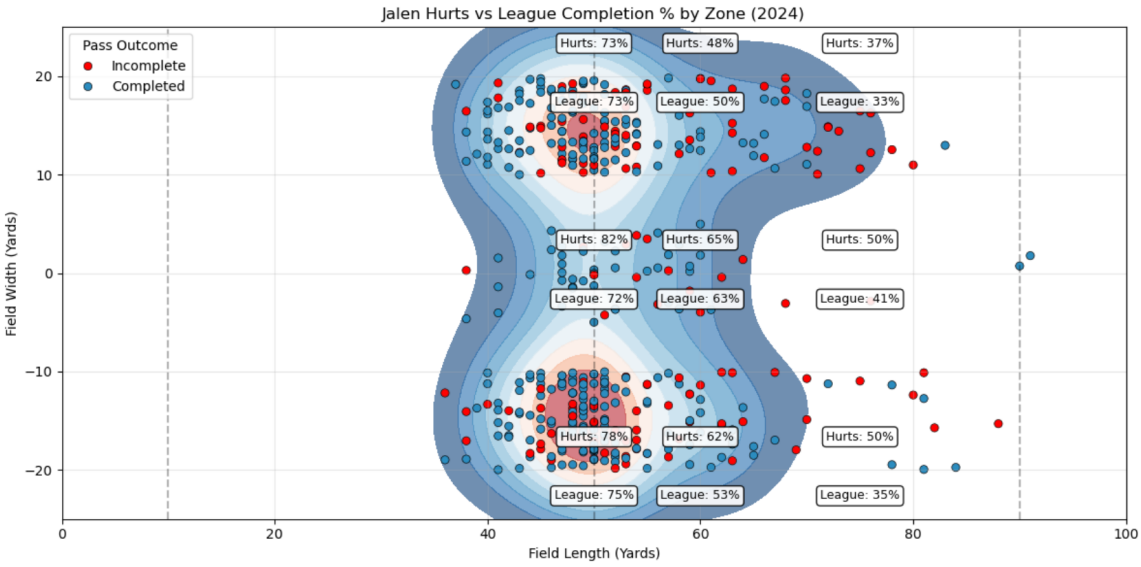

Figure 3: Zone-by-Zone Completion Percentage

Legend

- Text Labels:
    - Shows Hurts' and league-wide completion % per zone

Findings

- Hurts outperformed league average in nearly all short and intermediate zones, especially:
    - Short-Middle (82% vs 72%) and Right-Middle (62% vs 53%)
- Hurts' completion rate in deep zones vastly exceeded the league norm across all areas:
    - Deep Left (37% vs 33%), Deep-Middle (50% vs 41%), Deep Right (50% vs 35%)
- Short zones saw heavy usage and strong results (73–82% range)
- Visual comparison across zones suggests Hurts was an efficient, well-rounded passer in 2024, regardless of location

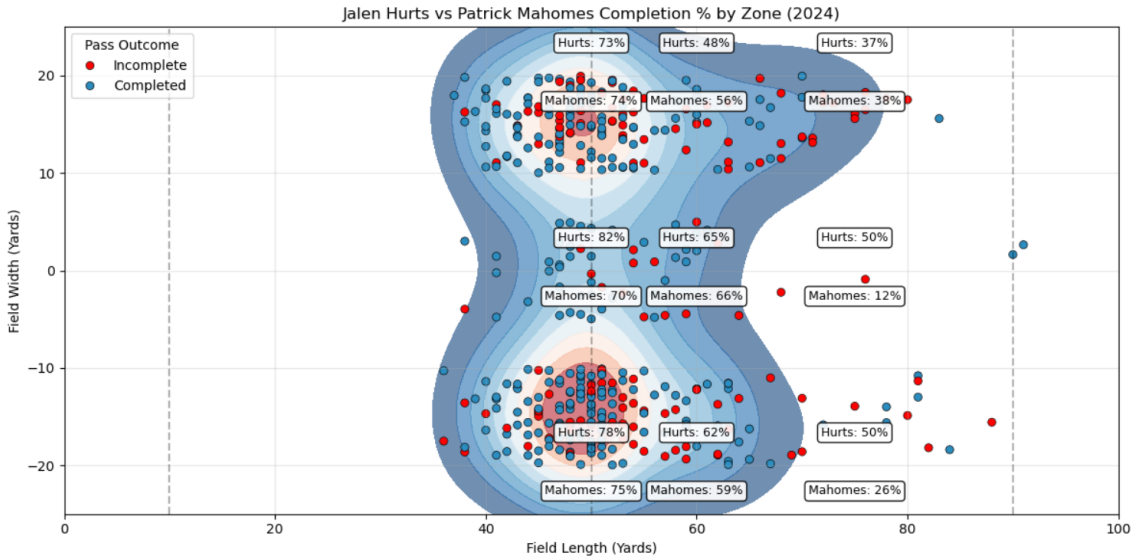

Figure 4: Hurts vs Mahomes Completion Percentage

Legend

- Displays completion percentages for Jalen Hurts and Patrick Mahomes across nine field zones

Findings

- Jalen Hurts outperformed Patrick Mahomes in 5 out of 9 zones, most notably in deep and short throws
- Hurts showed more balanced success across all zones, whereas Mahomes' completions were more concentrated in intermediate throws
- These results suggest Hurts was not just efficient — he was consistently effective from multiple areas on the field, indicating growth as a pocket passer in 2024

Signficance

This visualization is important because it provides a data-driven evaluation of Jalen Hurts' passing performance across the field during the 2024-25 NFL season. Throughout his career, Hurts has faced persistent criticism of his ability as a true passer, with many analysts labeling him as overly reliant on his athleticism and rushing ability. By comparing his completion percentages by zone against league-wide averages, this figure challenges that narrative and reveals that, in 2024, Hurts not only demonstrated above-average accuracy but did so consistently across all zones — short, intermediate, and deep.

These figures contributes to broader conversations about quarterback evaluation, especially in the context of dual-threat QBs like Hurts, and emphasizes the value of using data visualization to challenge long-standing biases in player assessment.

Data and Method

The data used in this project comes from **nfl_data_py**, a Python-based library for accessing the open-source nflfastR play-by-play database. The dataset includes all pass attempts from the 2024–25 NFL season, filtered specifically for Jalen Hurts using the passer and pass_attempt fields. Each pass was mapped onto a field coordinate system by estimating the forward distance (air yards) and lateral location (left, middle, right) to generate X and Y values for spatial analysis.

A KDE (kernel density estimation) heatmap was created to visualize the frequency of pass attempts, overlaid with scatter points indicating completions and incompletions. Passing zones were segmented into nine standard quadrants (short/mid/deep × left/middle/right), and completion percentages were calculated in each zone for both Hurts and the league average. The results were visualized and annotated using Python libraries including pandas, seaborn, and matplotlib.

Github

https://github.com/natemoserr/jalen-hurts-2024-passing-profile