# EDA Summary Statistics & Average Points



Average Points per Play by Period (All Games)
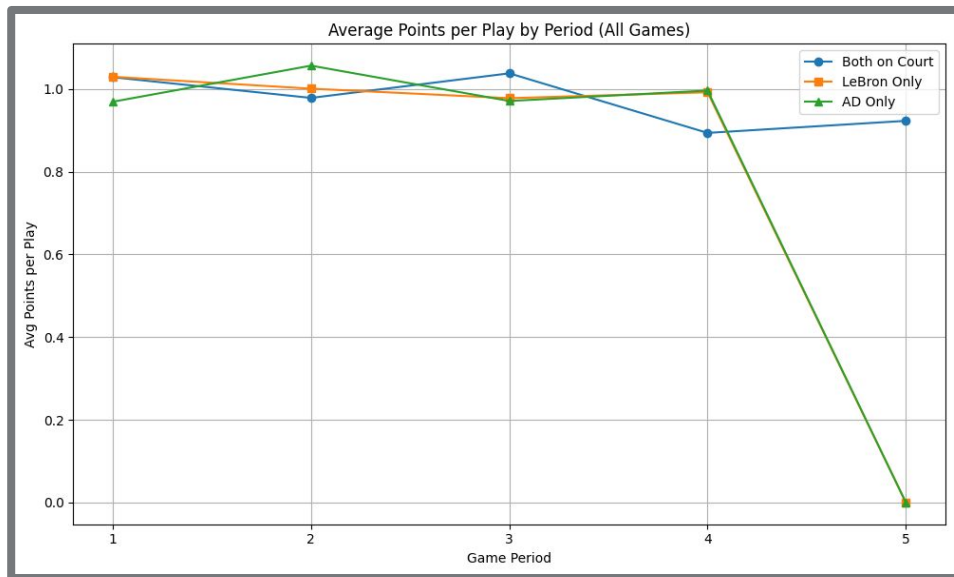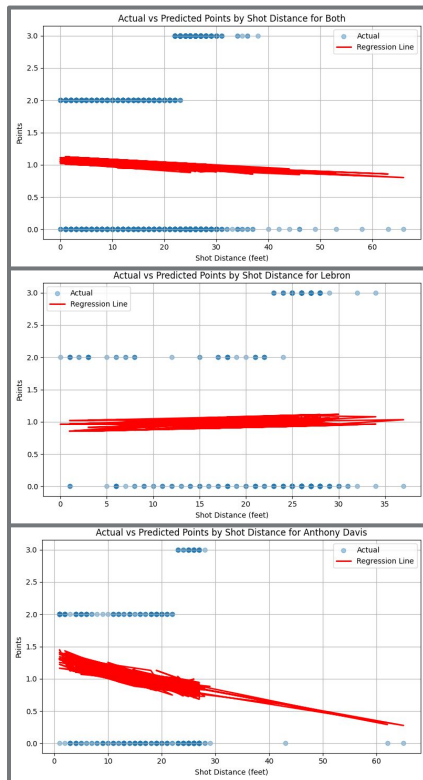
- **Part A: Anthony Davis & LeBron James 2019-2020**

- **Most Consistent Scorer:** LeBron-only plays show the most consistent scoring rate across all periods (~1.0 PPG).
- **Power Pair Peaks Mid-Game:** The LeBron-AD duo peaks in period 3, suggesting strong mid-game synergy.
- **AD-only Drop-off in Period 5:** Anthony Davis-only configurations drop to 0 PPG in period 5, possibly due to rest or strategic benching.
- **Period 4 Dip for Duos:** Scoring efficiency of the duo dips in period 4—could indicate fatigue or rotation shifts.
- Overall, all three configurations hover around 1 point per play, suggesting high impact presence for both players.
- **Strategic Insight:** LeBron may be more independently effective, while AD's impact is enhanced in duo settings.
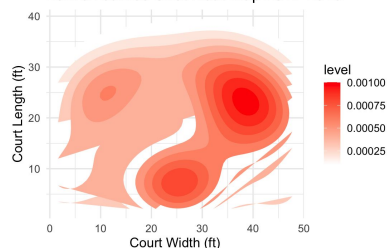
**Carnegie Mellon University**

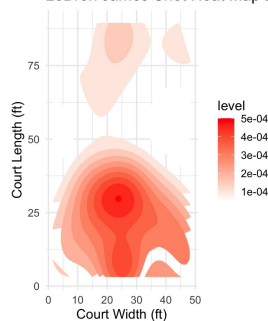# Do Shot Context & Distance Predict Scoring?



- Anthony Davis shows a **statistically significant negative** relationship between shot distance and points ($p = 0.02$).
  - Longer shots = fewer points for AD.
- LeBron James' scoring is **not significantly** influenced by shot distance or context ($p > 0.7$).
- When both players share the court, shot distance has minimal predictive value for scoring.
  - Combined model $R^2 = 0.001$
- KNN Model Accuracy (Predicting Shot Success):
  - Both Players: 62% accuracy, 20% scoring probability
  - LeBron Only: 52% accuracy, 40% scoring probability
  - AD Only: 54% accuracy, 40% scoring probability

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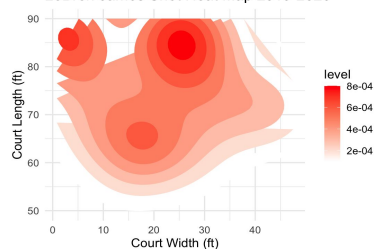
# Heat Maps and Sensitivity Analysis



LeBron James Shot Heat Map 2017-2018



LeBron James Shot Heat Map 2018-2019



LeBron James Shot Heat Map 2019-2020

- Heat Maps show where Lebron James frequently took shots in each given season (**Volume not Accuracy**)
- 2017-2018 was his final season with Cavaliers (No AD), 2018-2019 was his first year with the Lakers (No AD), 2019-2020 was his championship year with the Lakers (With AD)
- **Darker Red** = Higher Shot Density, **Lighter Red** = Fewer or No Shot Attempts
- **"Level"** legend represents **density value** through calculated **Kernel Density Estimation (KDE)**
- 2017–2018: Balanced scoring rim, midrange, and some 3PT activity.
- 2018–2019: Heavier paint presence, limited spacing and mostly inside.
- 2019–2020: More perimeter activity reflects his facilitator and shooter role with the joining of AD

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