

START

Is Stephen Curry really a guard?

2026 Virtual Sports Analytics Conference: Rising Stars and All Stars

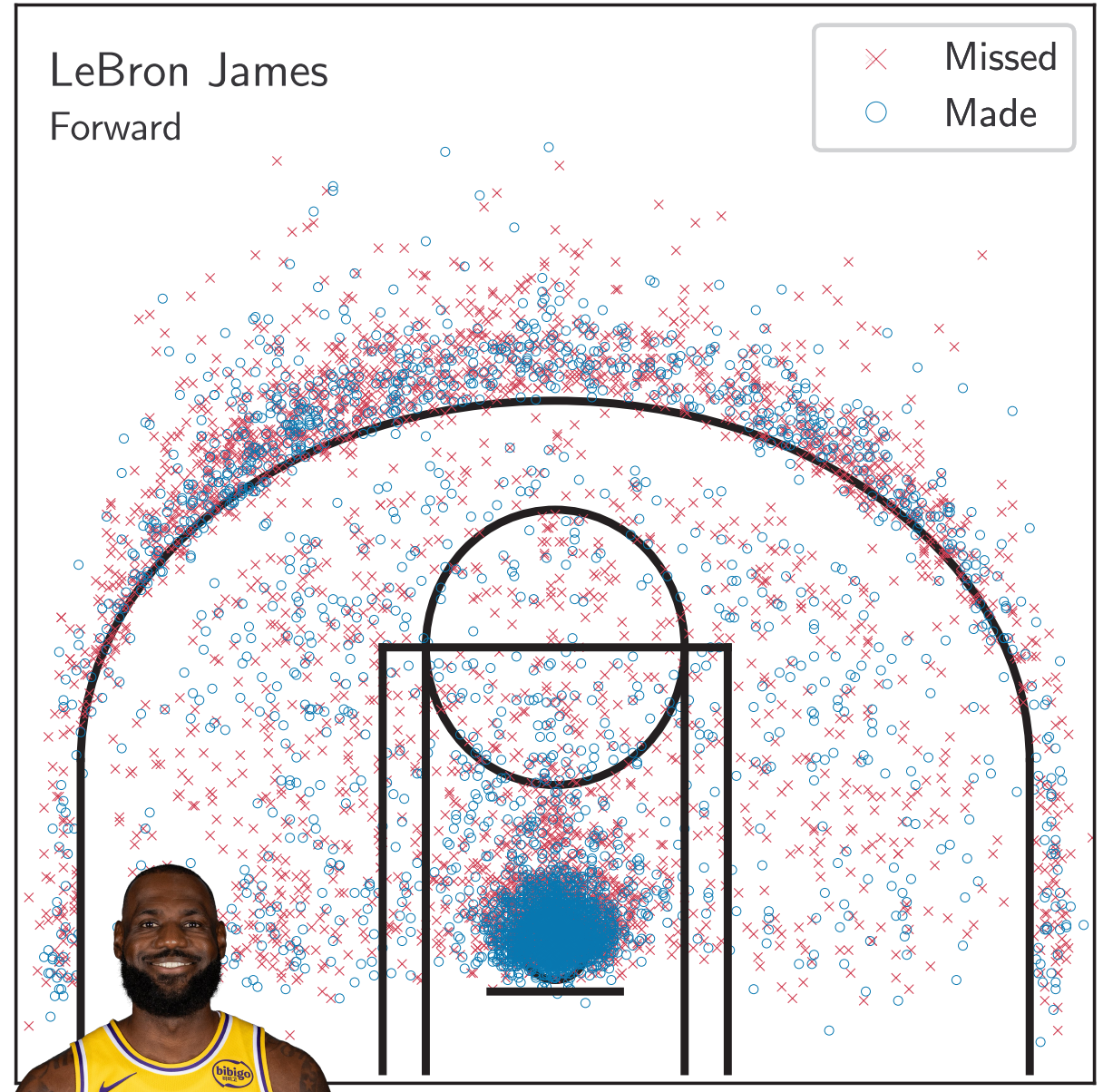
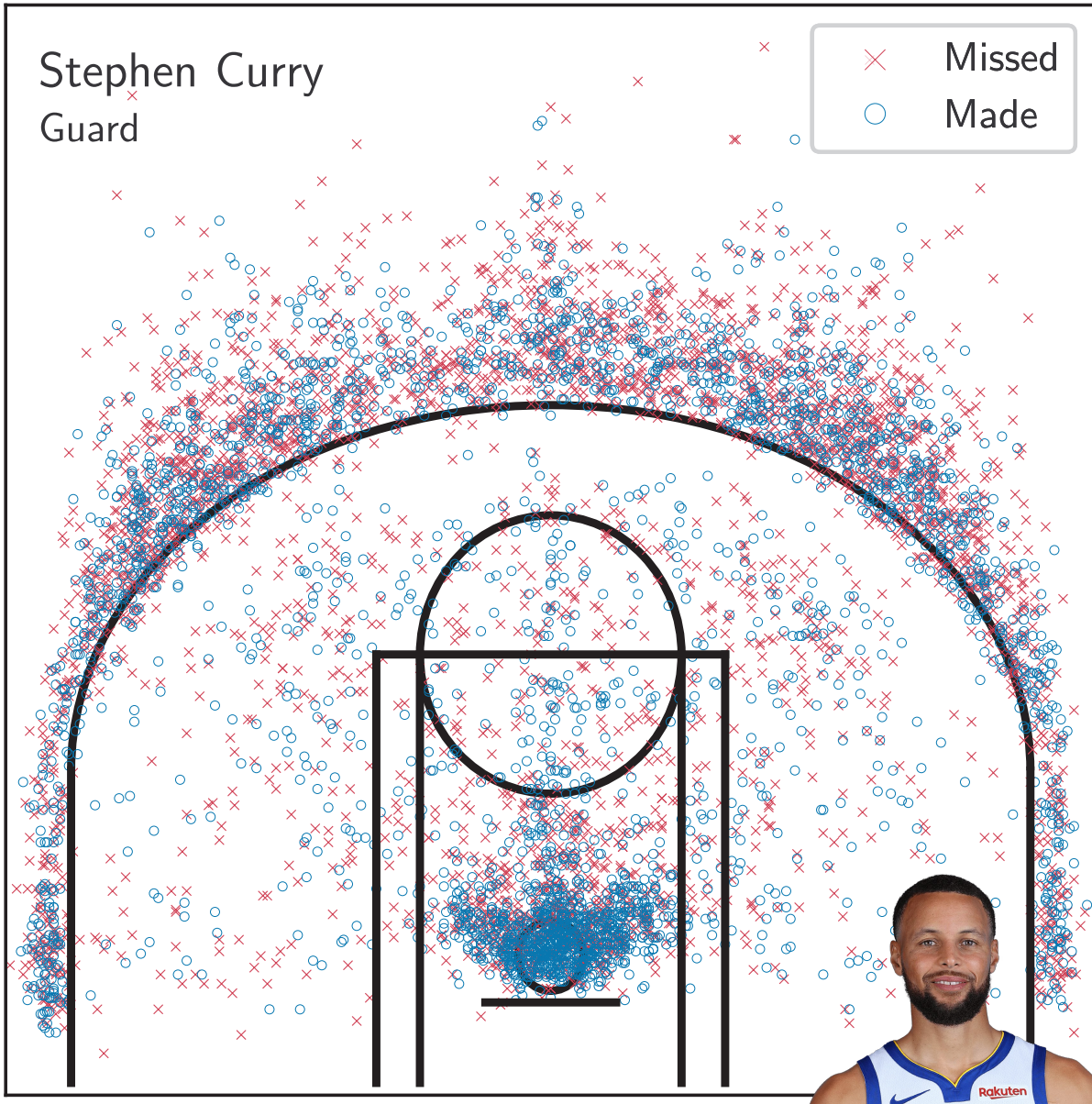
Steven Golovkine

April 24th, 2026

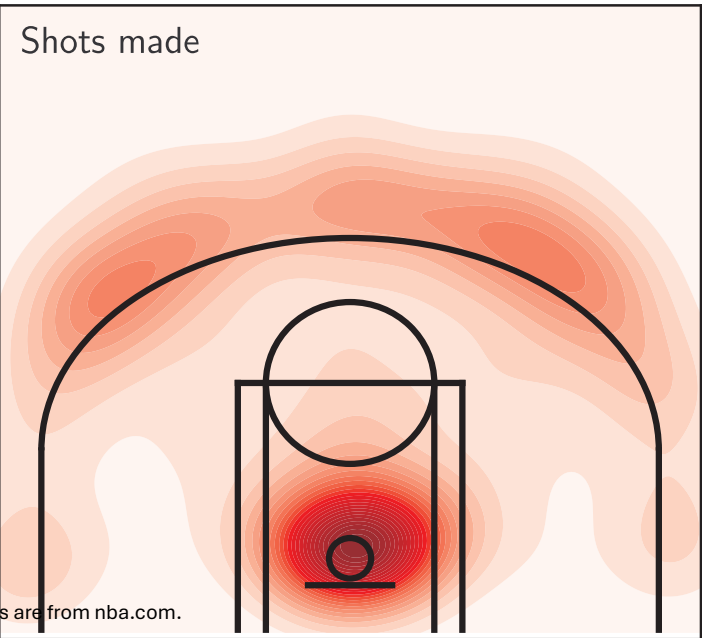
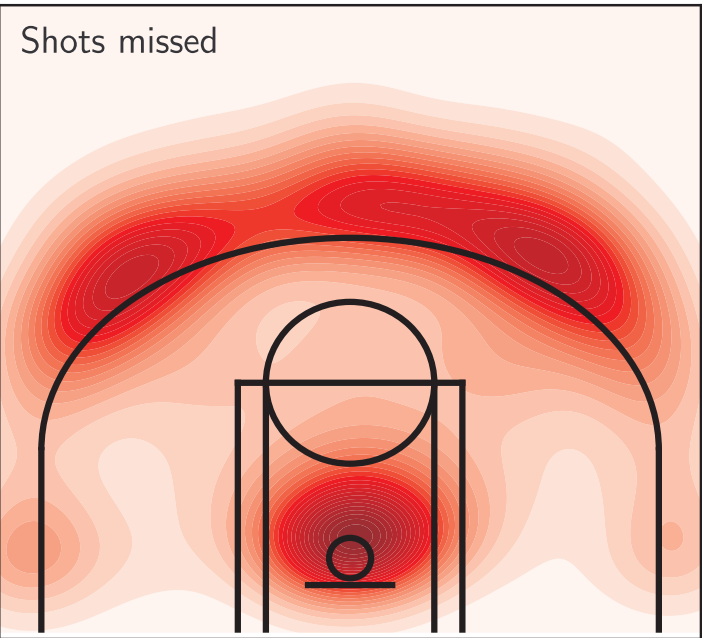


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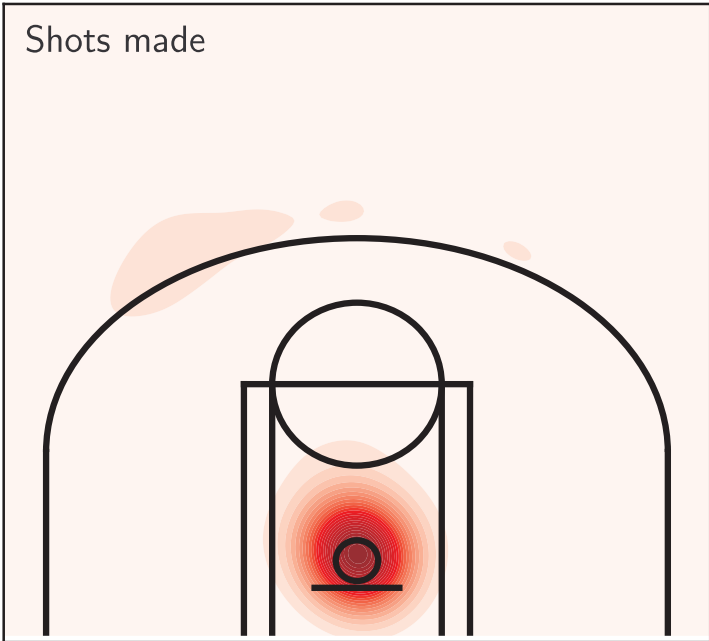
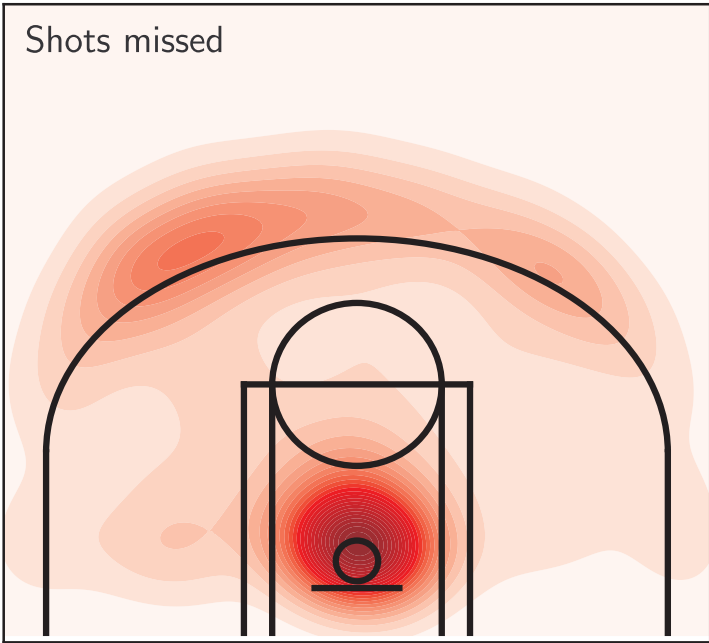
Faculté des sciences et de génie
Département de mathématiques
et de statistique



Stephen Curry - Guard



LeBron James - Forward



Shots density are from the authors. Player's pictures are from nba.com.

Karhunen-Loève decomposition

$$X(t) = \sum_k a_k \phi_k(t)$$

Solution:

ϕ_k eigenfunctions of the covariance function C

$$a_k = \langle X, \phi_k \rangle$$

How to compute:

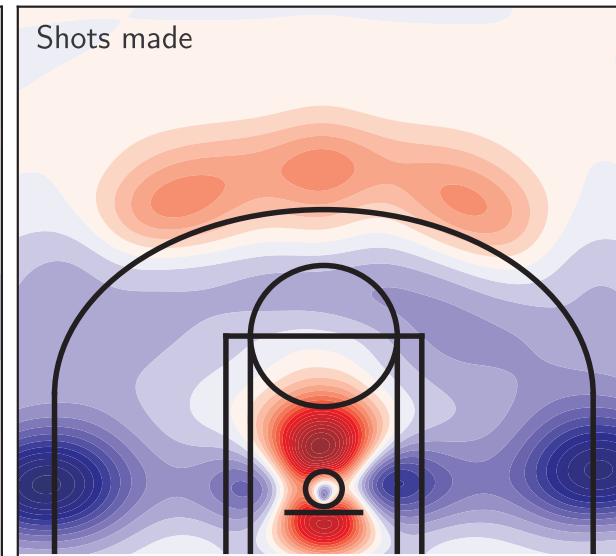
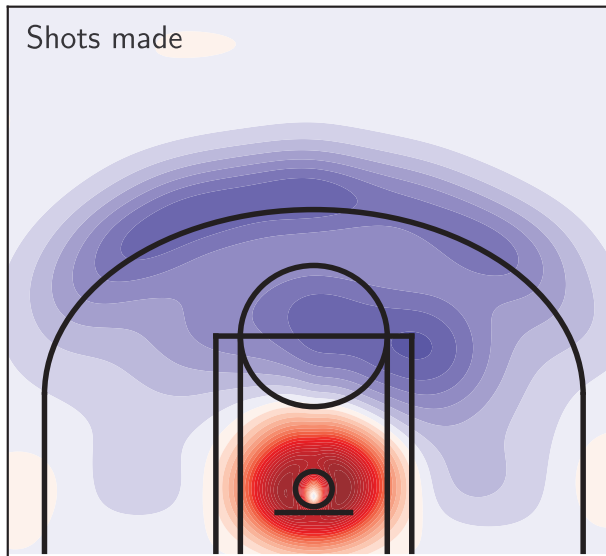
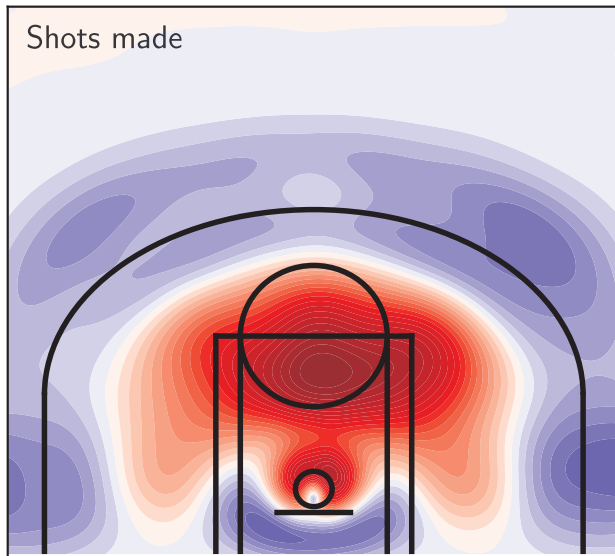
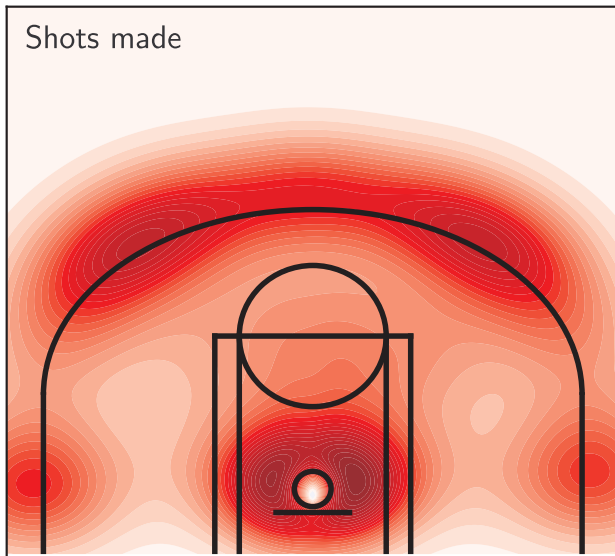
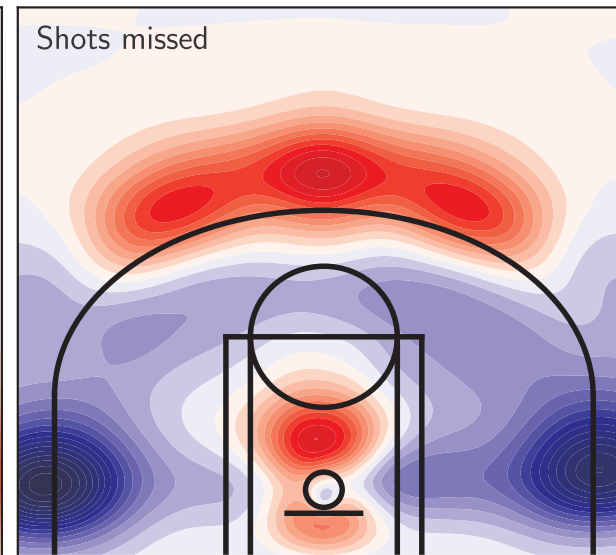
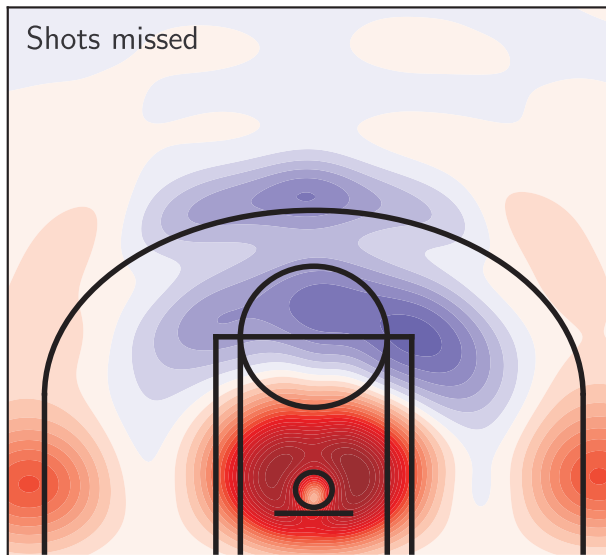
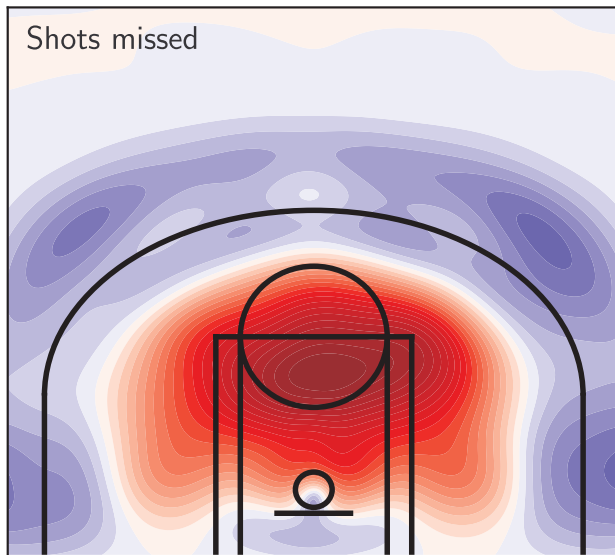
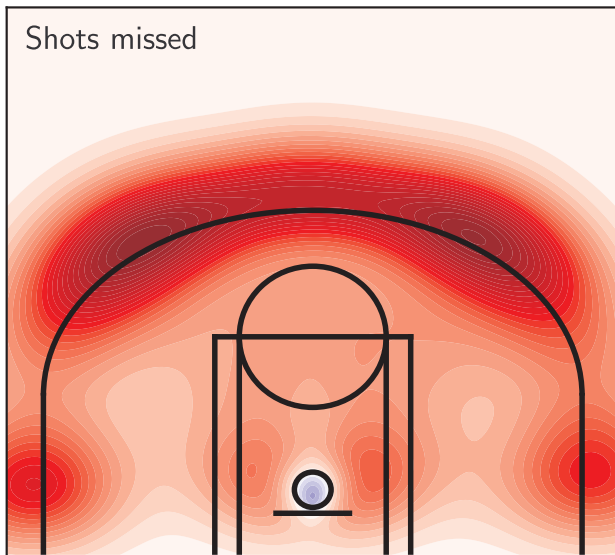
$$\text{Gram matrix: } M_{ij} = \langle X_i, X_j \rangle$$

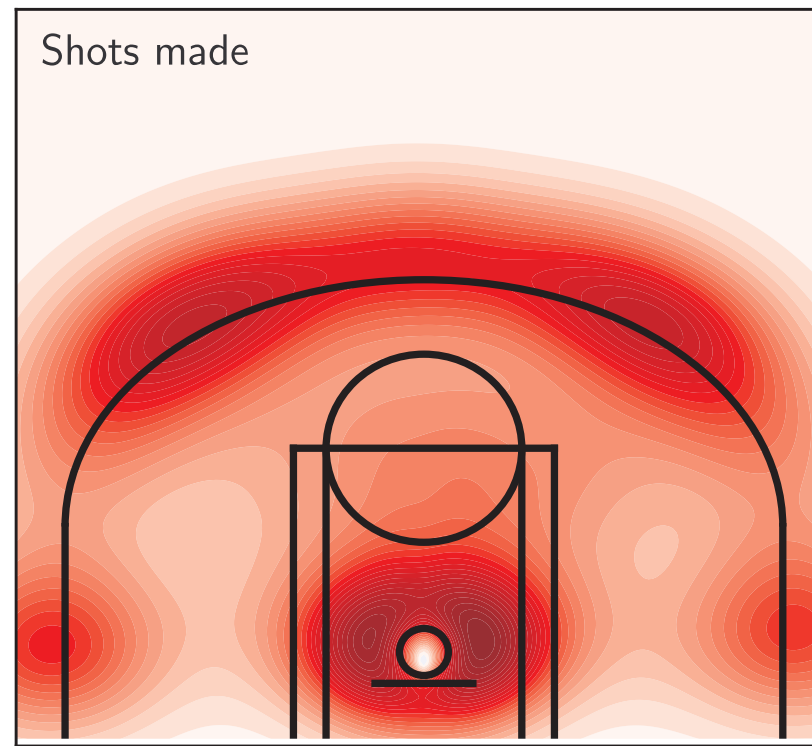
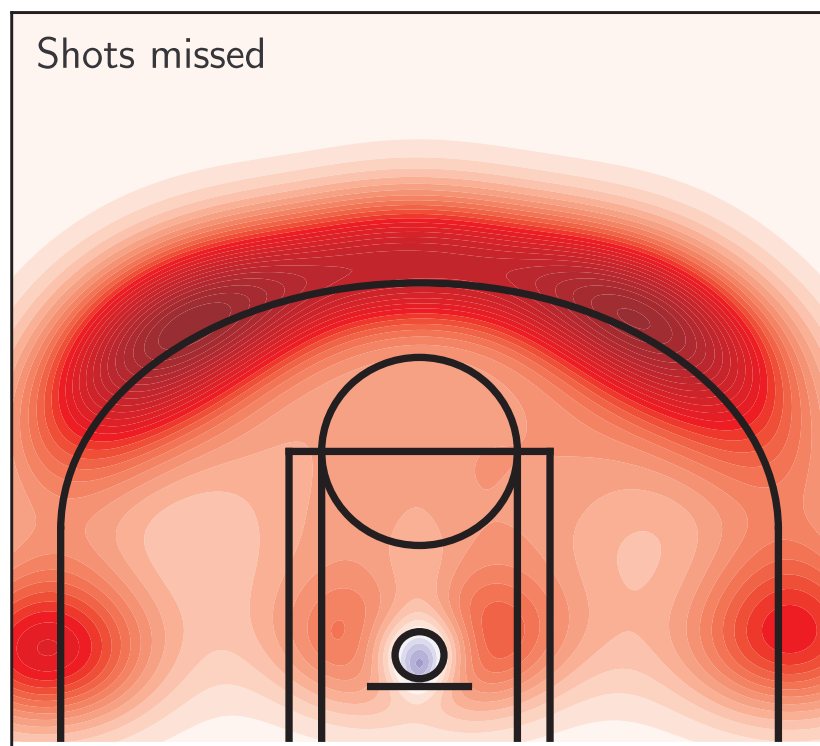
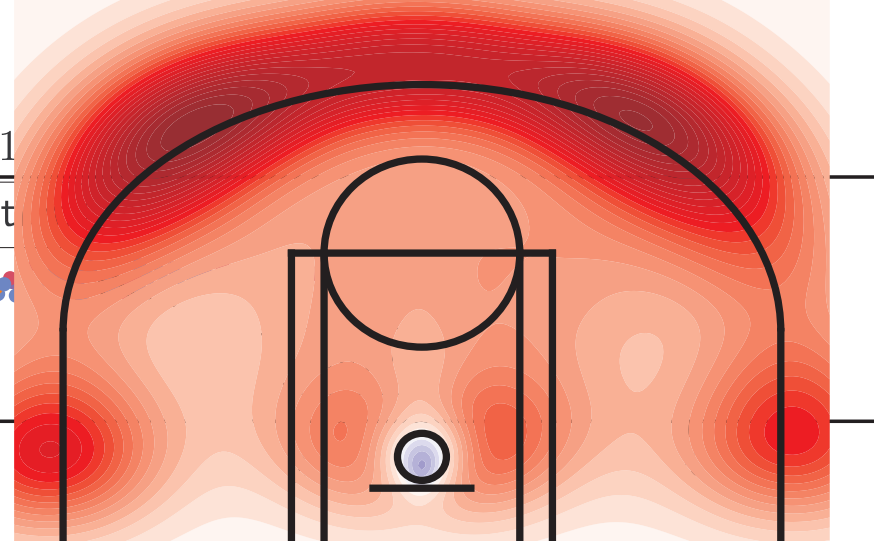
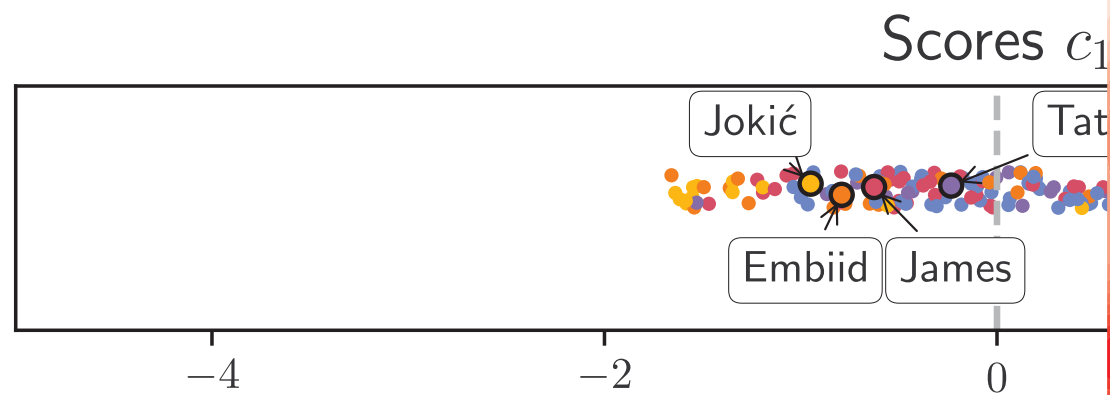
Eigenfunction ϕ_1 (67.9%)

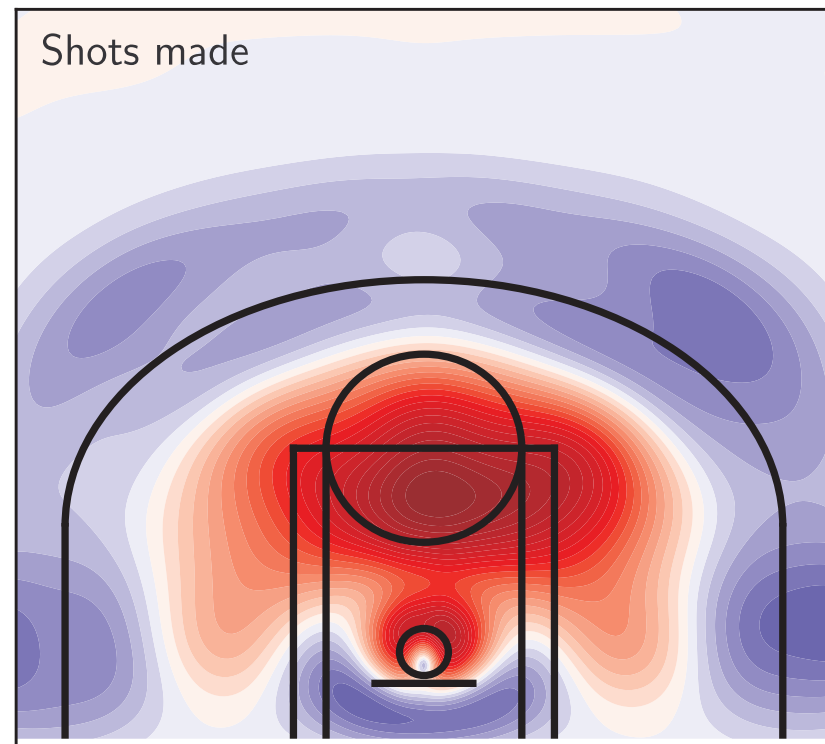
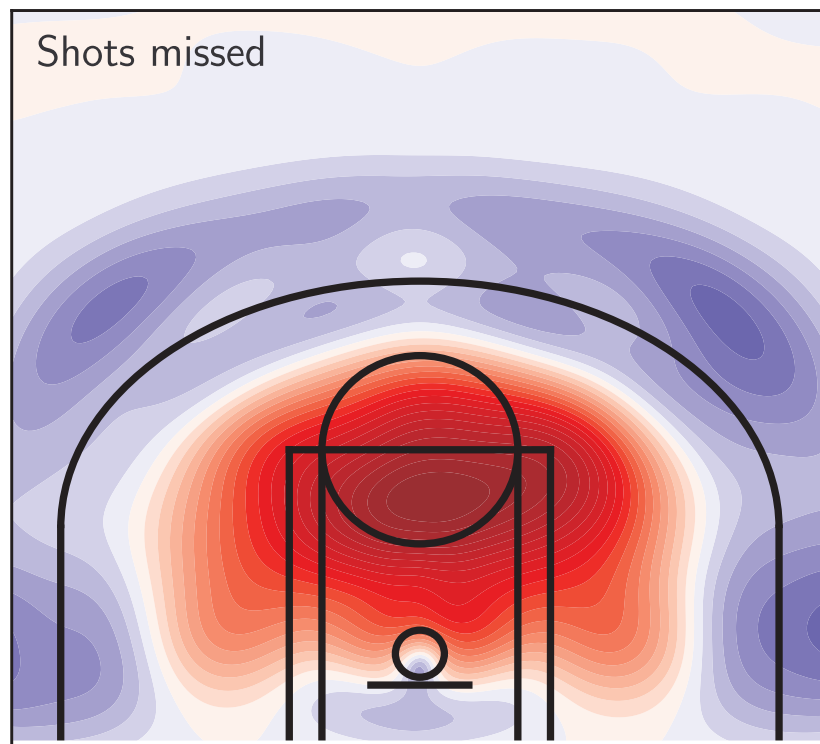
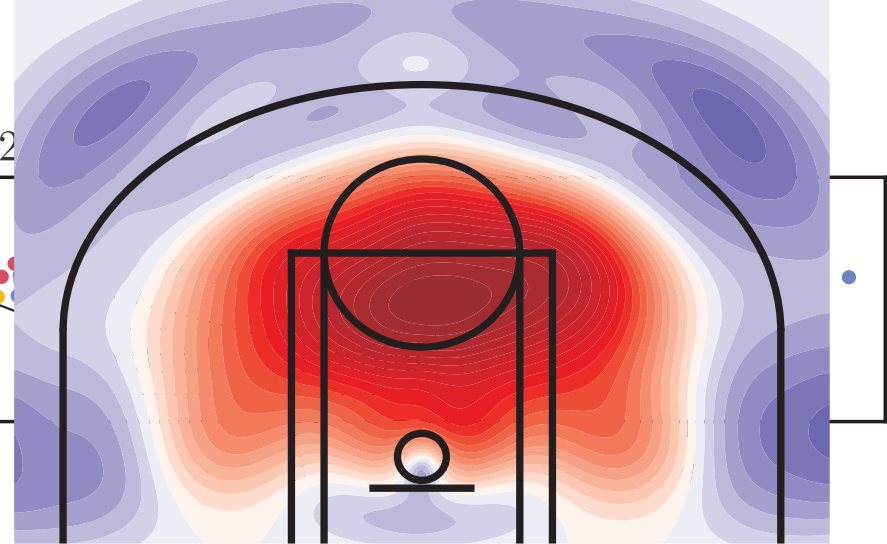
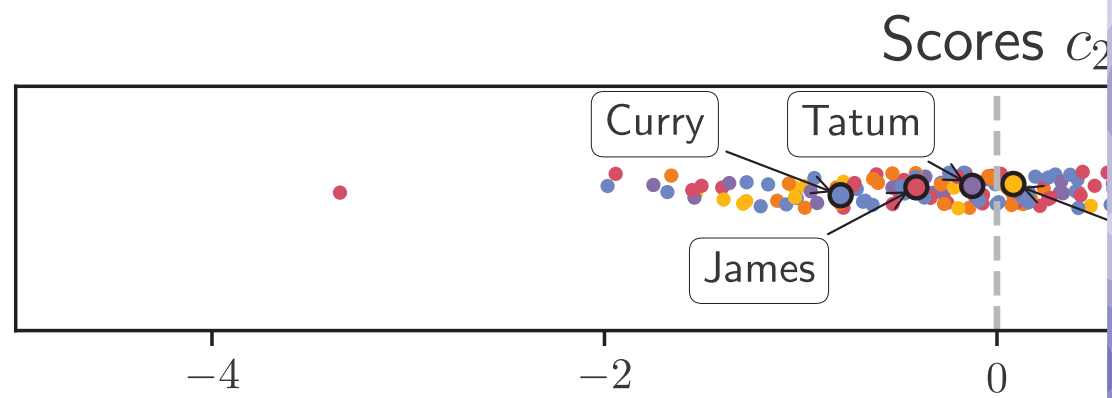
Eigenfunction ϕ_2 (8.5%)

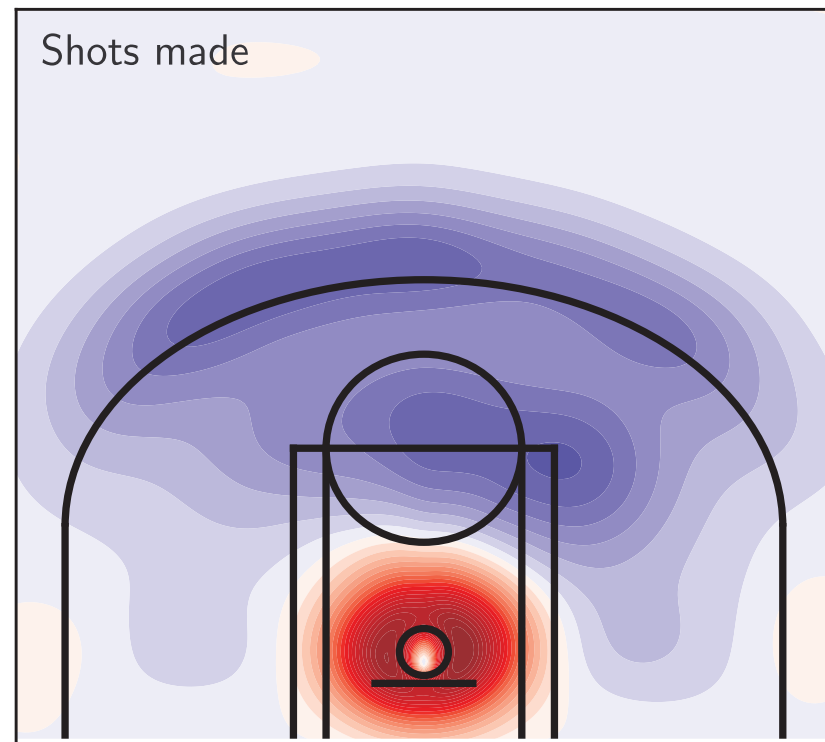
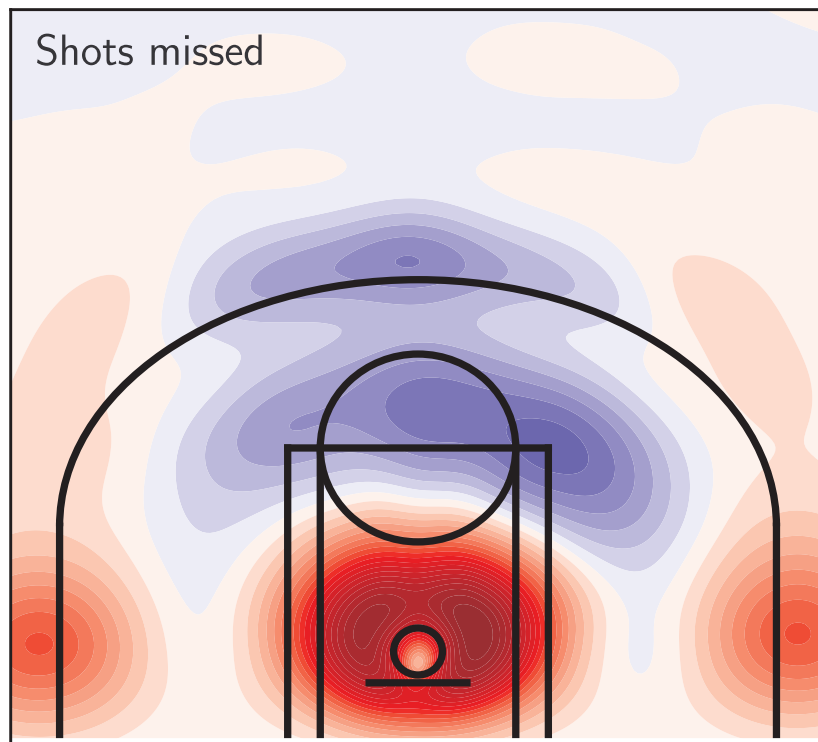
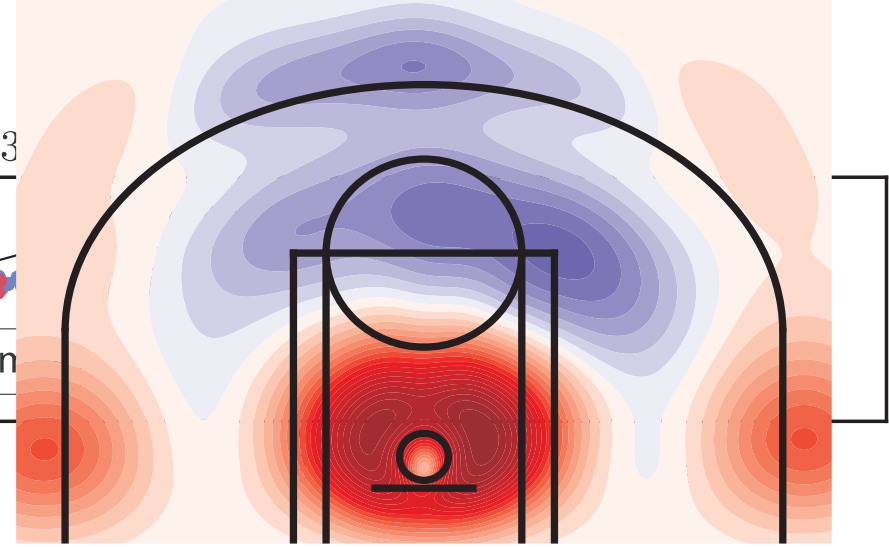
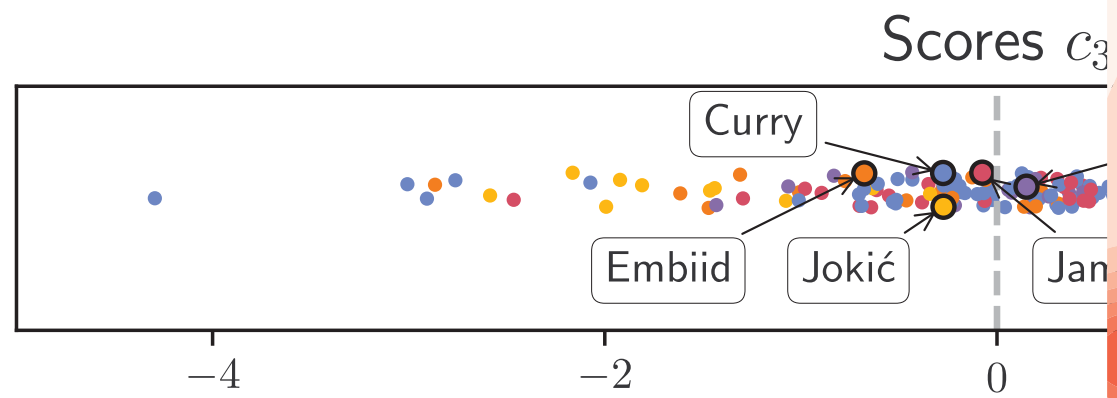
Eigenfunction ϕ_3 (6.1%)

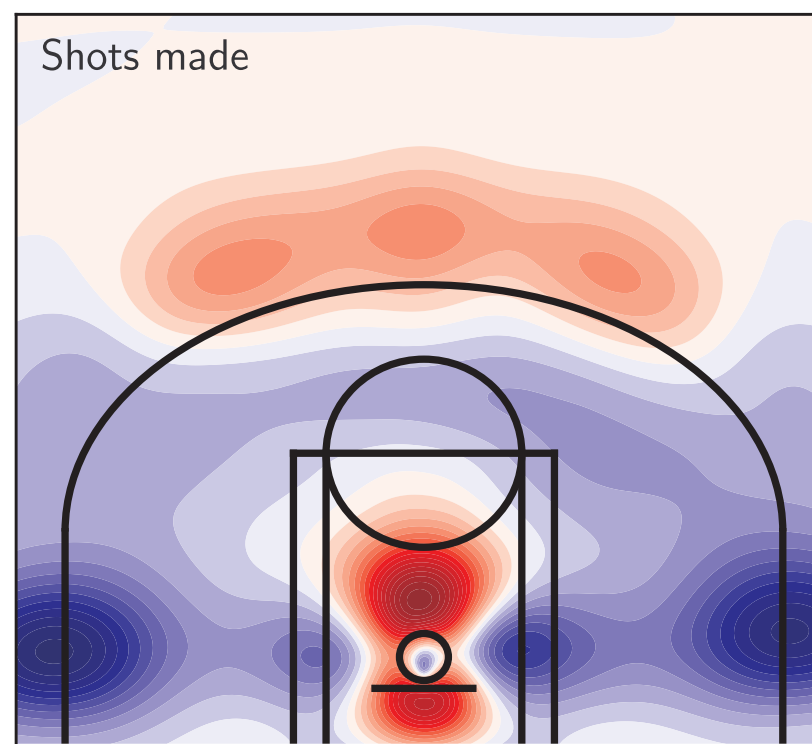
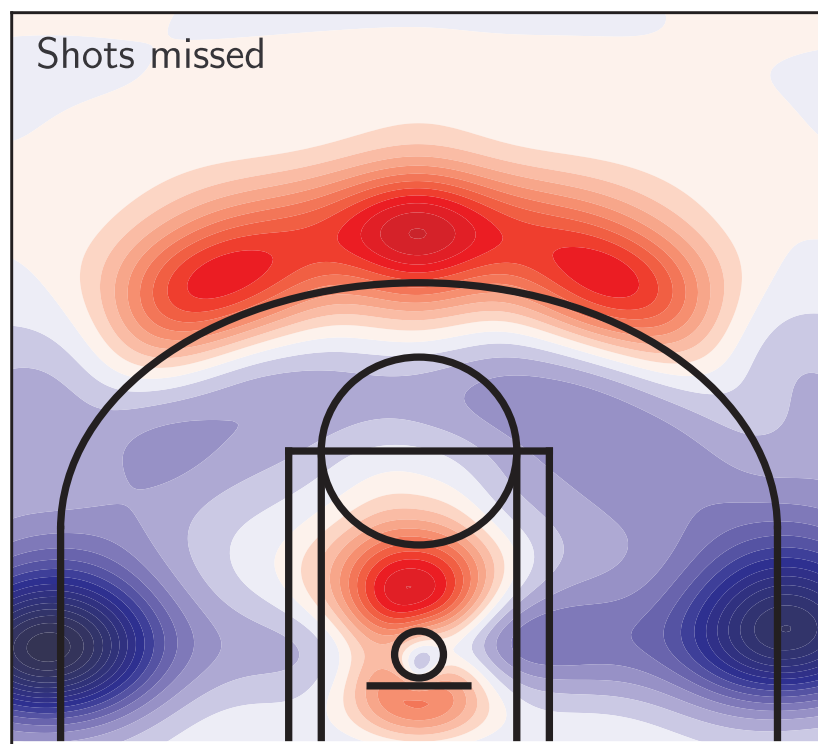
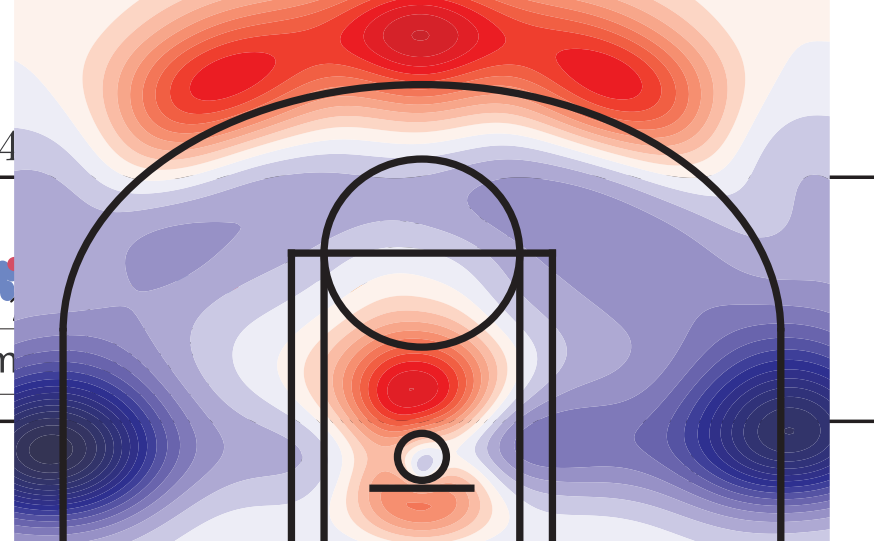
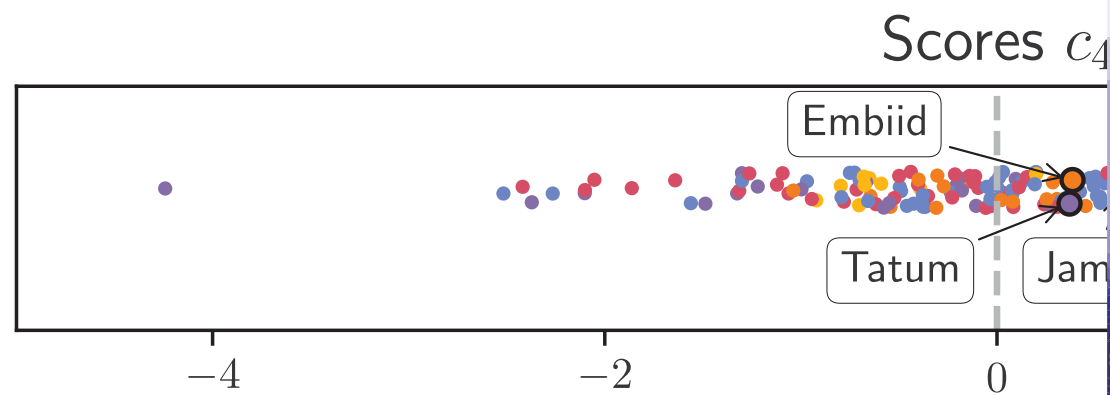
Eigenfunction ϕ_4 (4.0%)









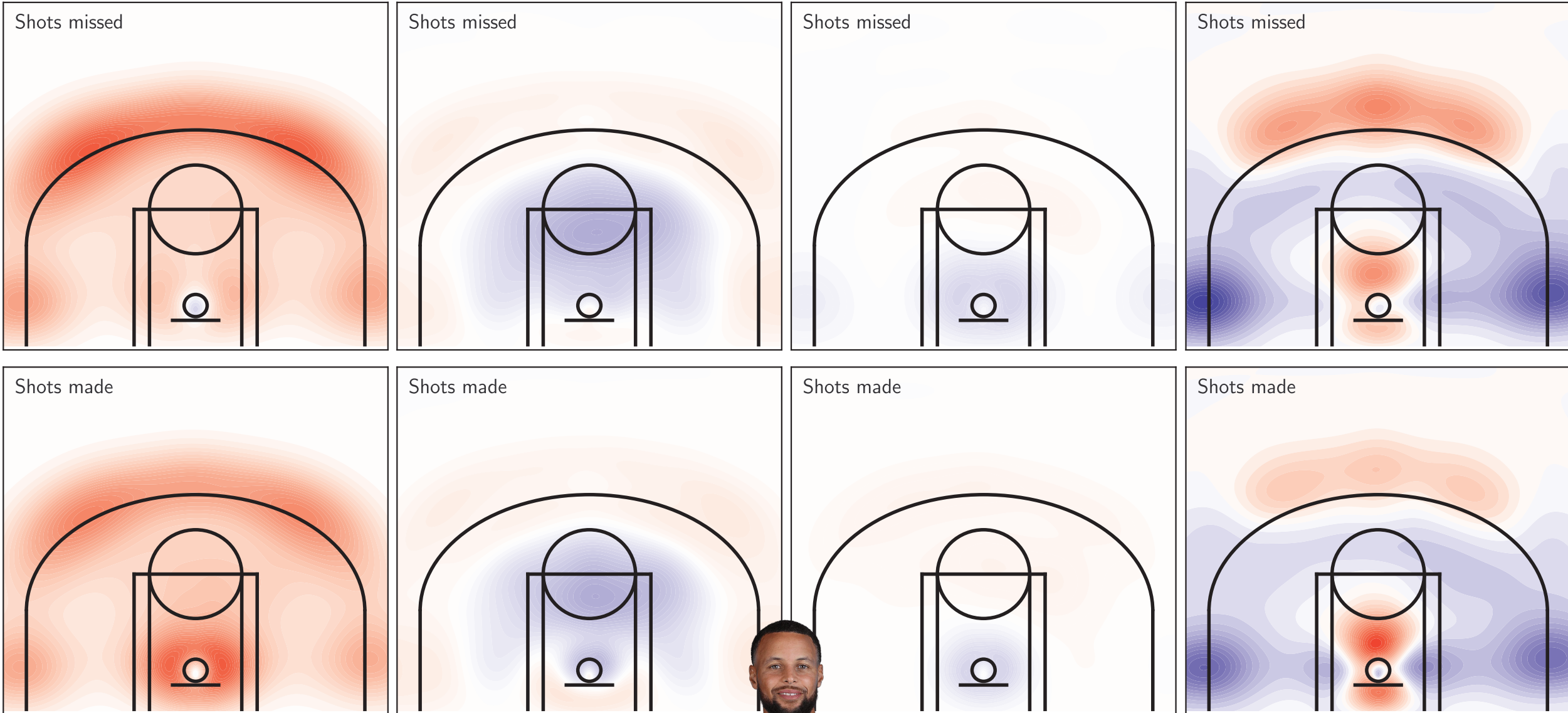


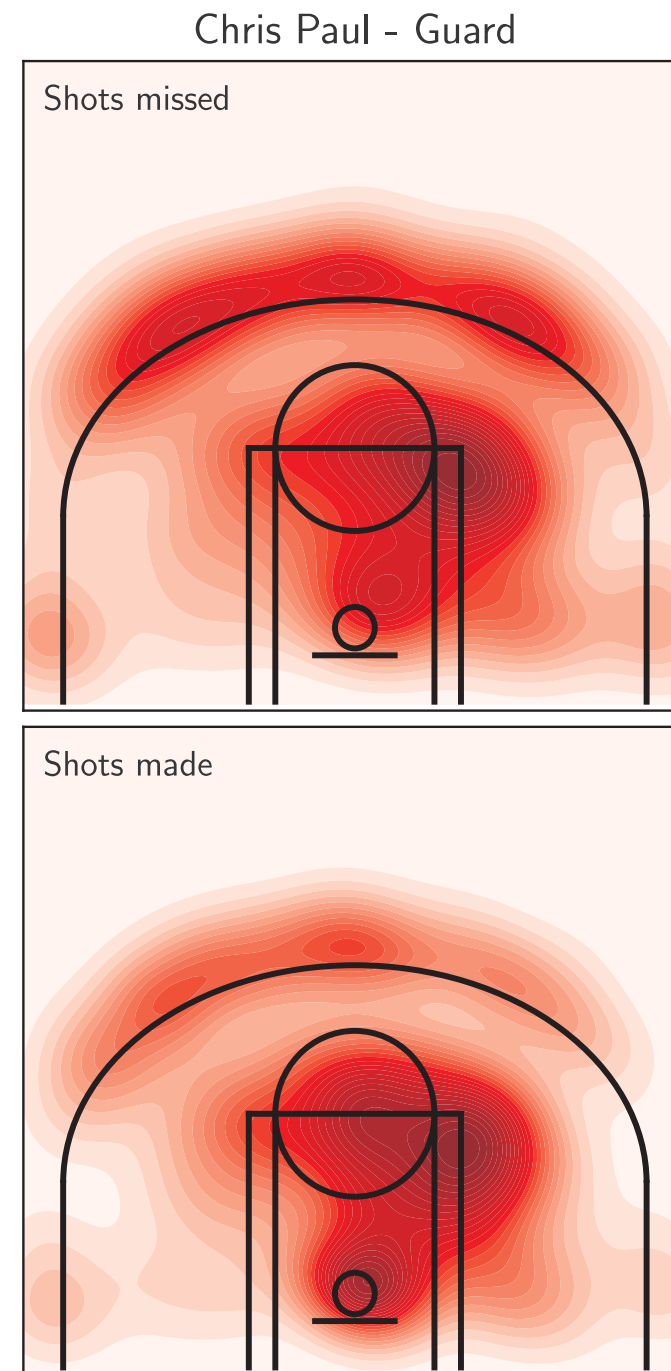
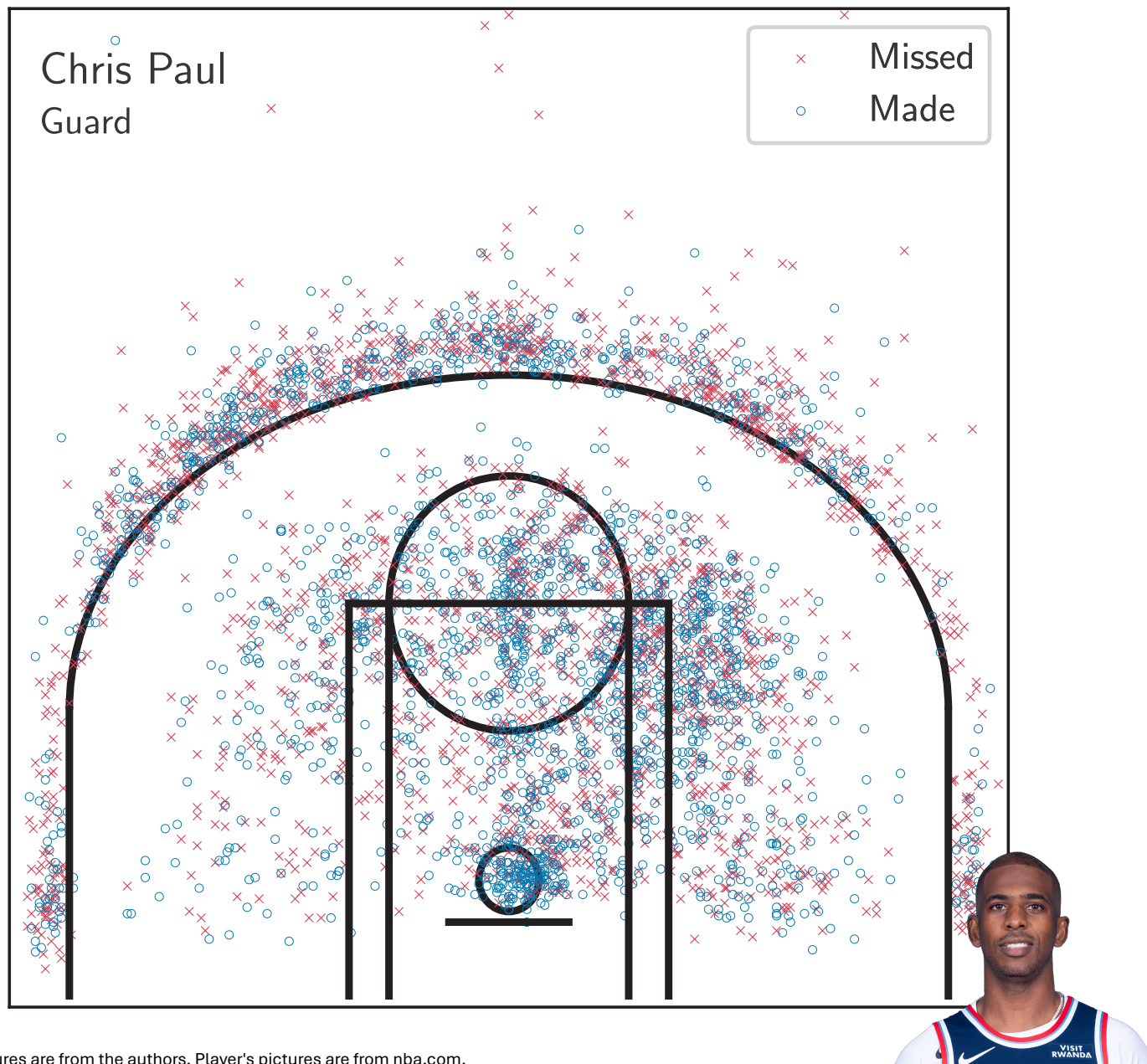
Score $\times$ Eigenfunction $c_1\phi_1$

Score $\times$ Eigenfunction $c_2\phi_2$

Score $\times$ Eigenfunction $c_3\phi_3$

Score $\times$ Eigenfunction $c_4\phi_4$





1. Select 5 initial medoids (players).
2. Assign each point to the nearest medoid (player) based on Euclidean distance.
3. Try replacing a medoid with a non-medoid point to see if it reduces clustering cost.
4. Repeat Steps 2 & 3 until no further improvement.

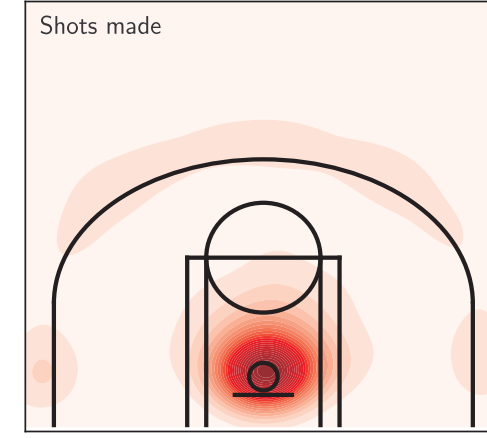
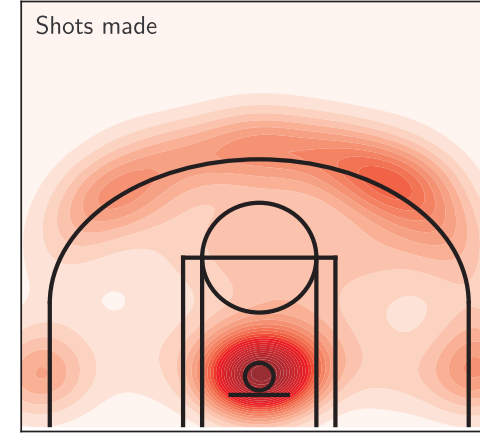
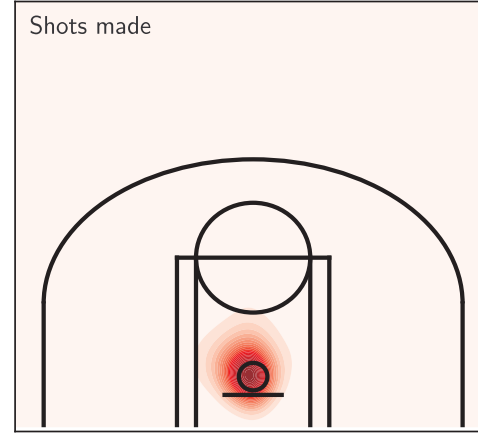
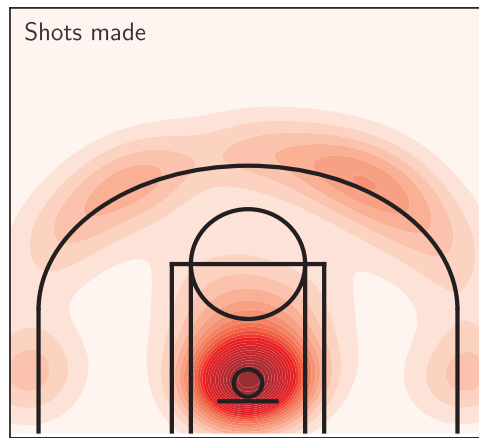
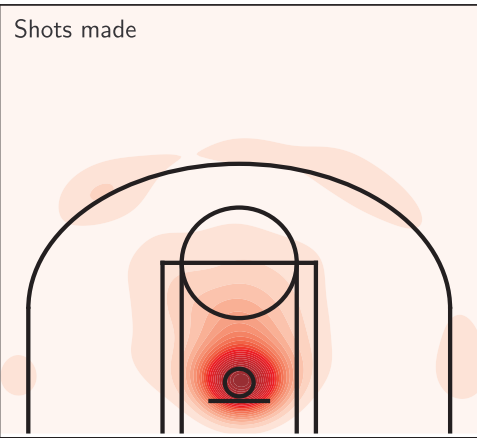
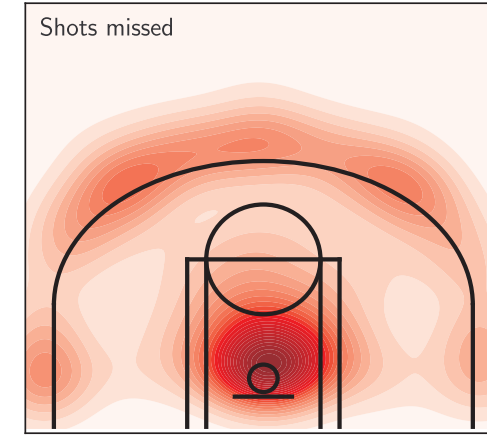
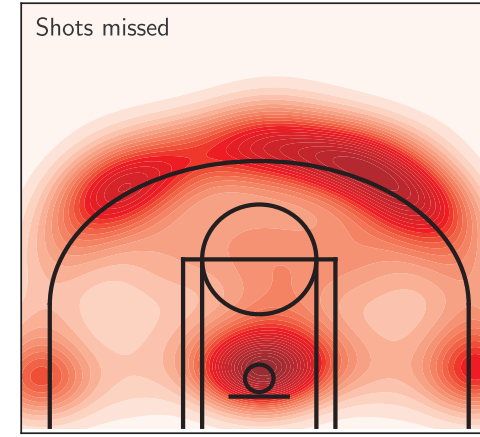
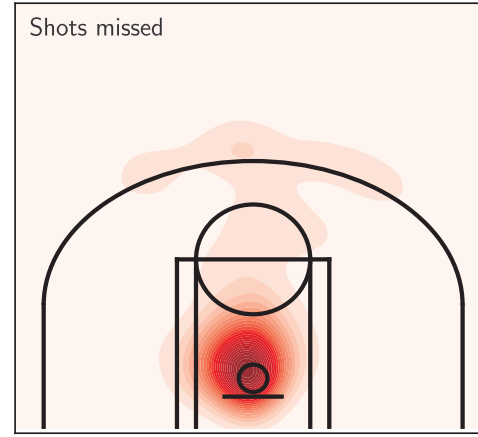
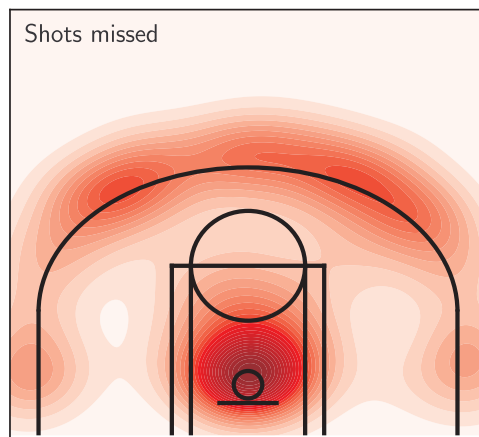
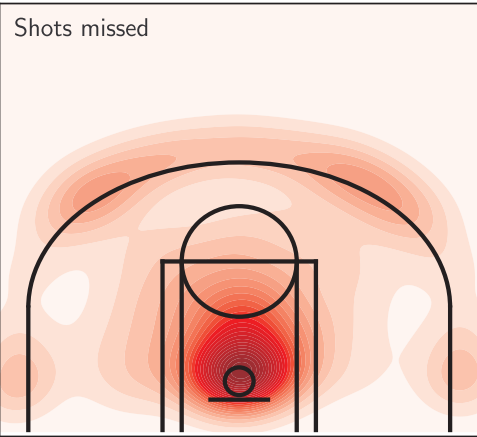
Cluster 1 - Tobias Harris

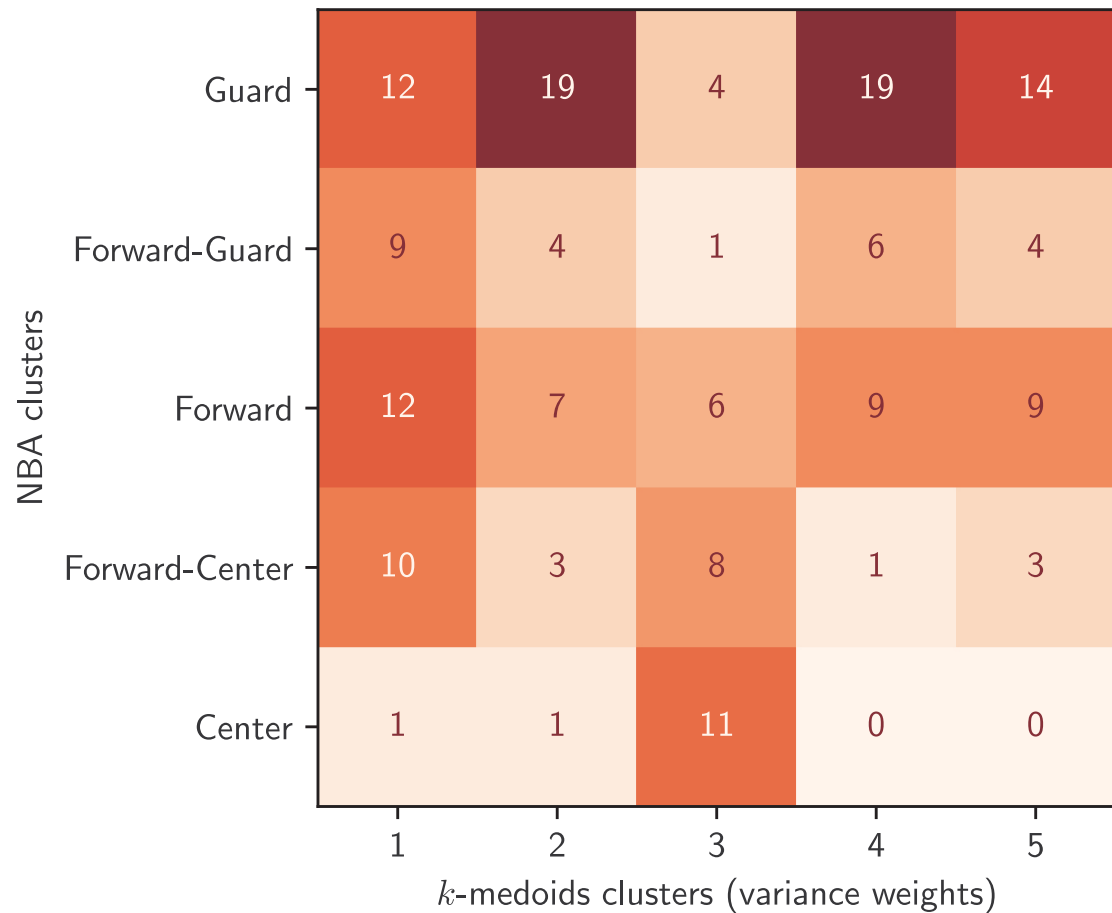
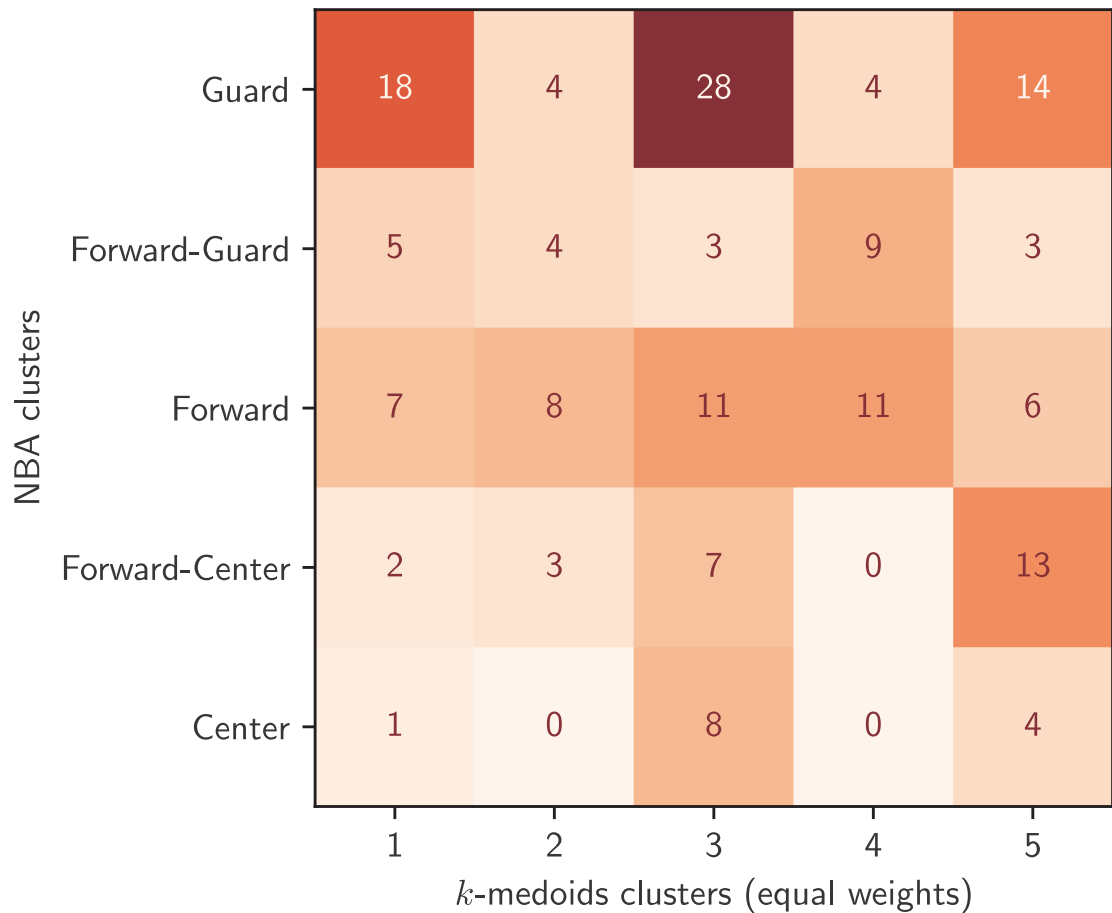
Cluster 2 - De'Anthony Melton

Cluster 3 - Domantas Sabonis

Cluster 4 - Tim Hardaway Jr.

Cluster 5 - Kyle Kuzma







STOP