
NBA 2nd-Half Predictions

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Goals

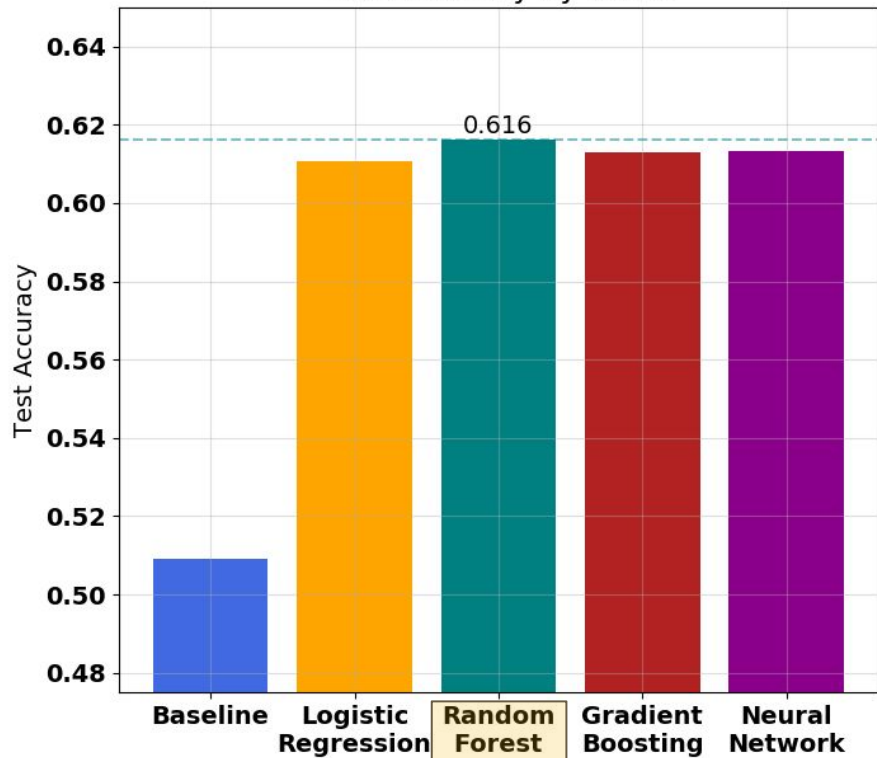
- Predict result in 2nd-half of NBA games from only information known at the halftime break.
- Cost/benefit analysis
- Choose a betting system
- Perform a betting simulation

Data

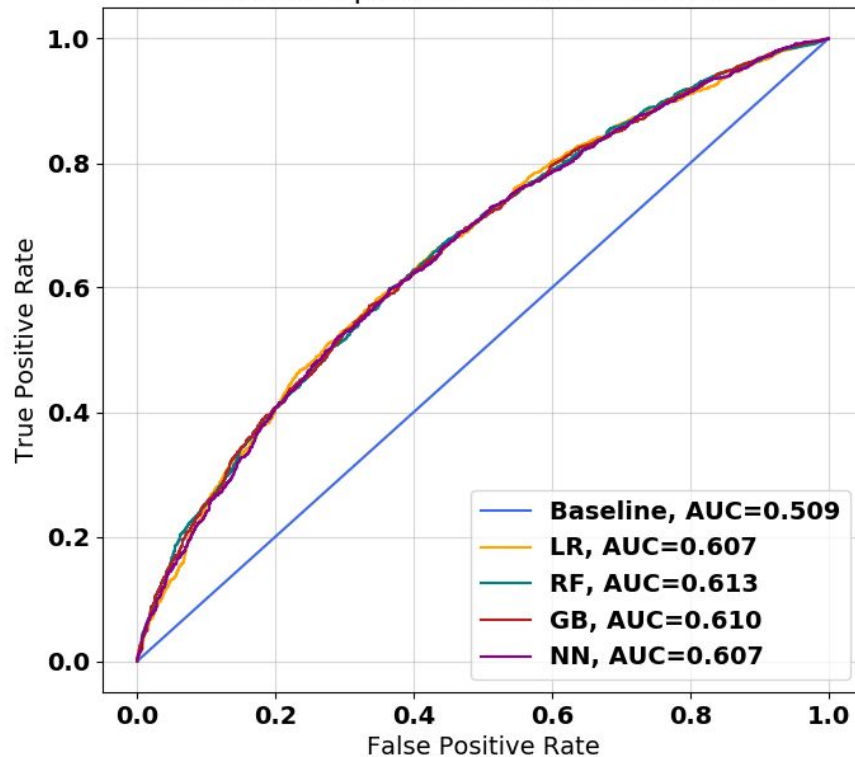
- 16,461 games from last 13 NBA seasons
- 25 features including:
 - 21 1st-half Stats for home and away team
 - Did home or away team play yesterday?
 - Pre-game point spread (indicates which team is favored by sportsbooks)
 - Lead at halftime for the favored team (+/-).
- Target variable: Did the home team score more points in 2nd-half than the visiting team? (1=yes, 0=no)
- Target = 1 about 53%

Model Selection

Test Accuracy By Model



Receiver Operator Characteristic Curve



Cost/Benefit Analysis

2015, 2016, 2017 Seasons

\$100 bet on each game:

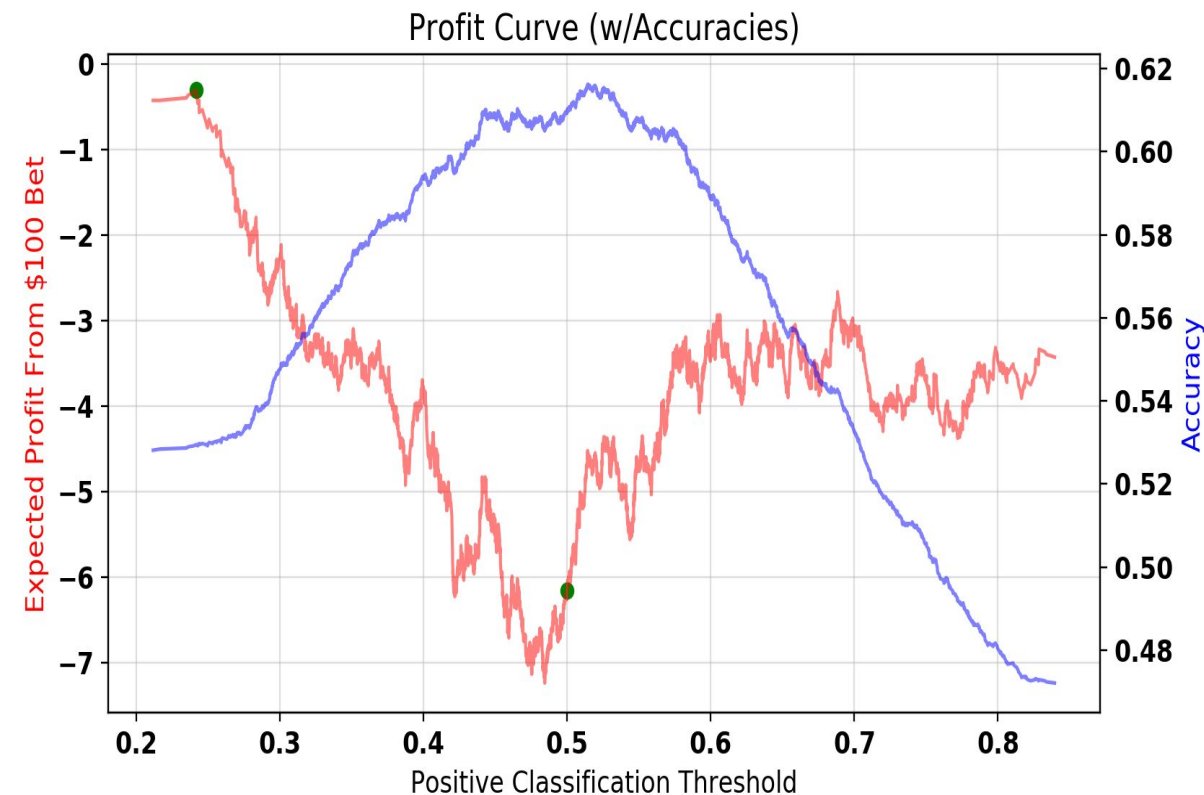
- Predict 1 = Bet Home Team
- Predict 0 = Bet Away Team

CB Matrix for thresh ~ 0.5:

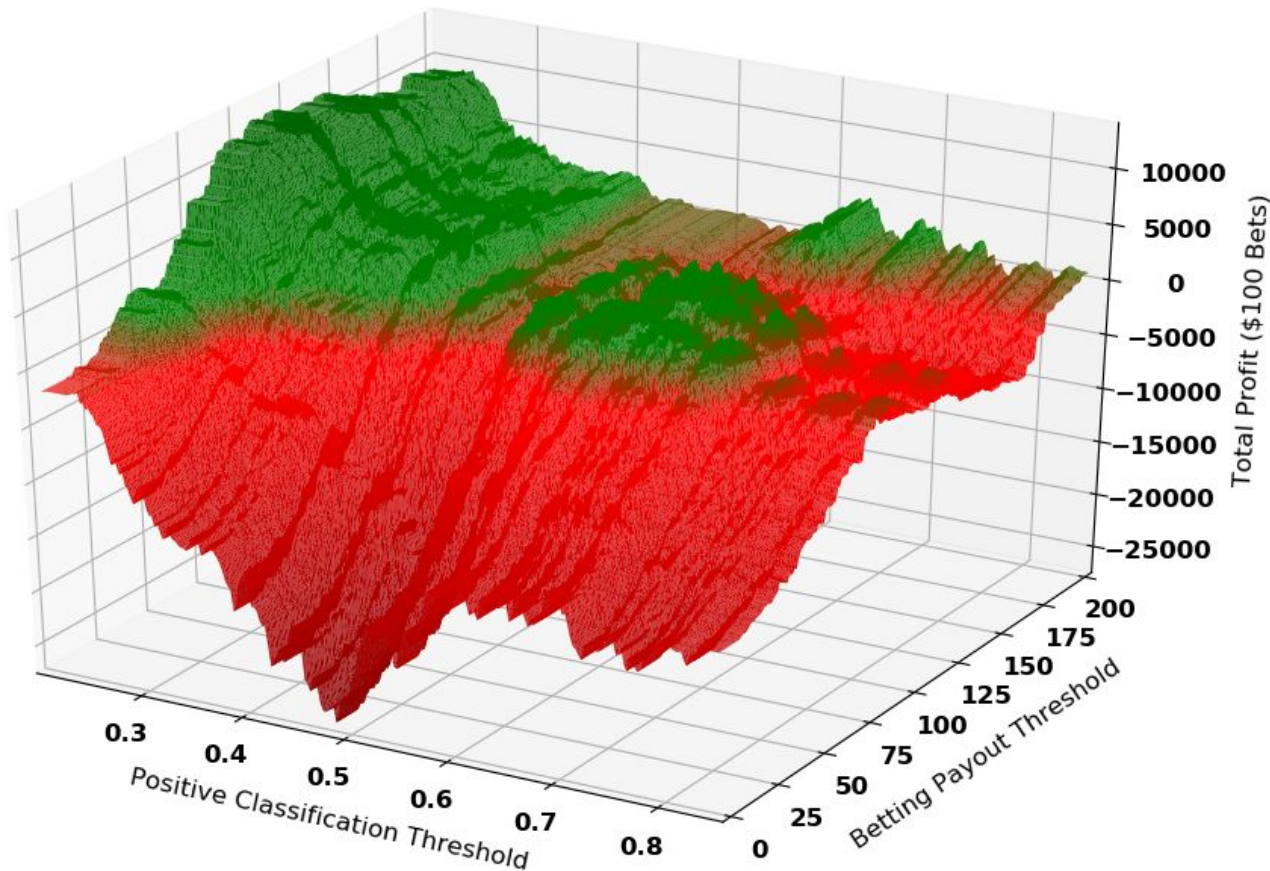
	Predict Positive	Predict Negative
Positive	\$44.75	-\$100.00
Negative	-\$90.58	\$58.30

CB Matrix for thresh ~ 0.0:

	Predict Positive	Predict Negative
Positive	\$81.79	N/A
Negative	-\$92.43	N/A



Cost/Benefit Analysis



Global Max:

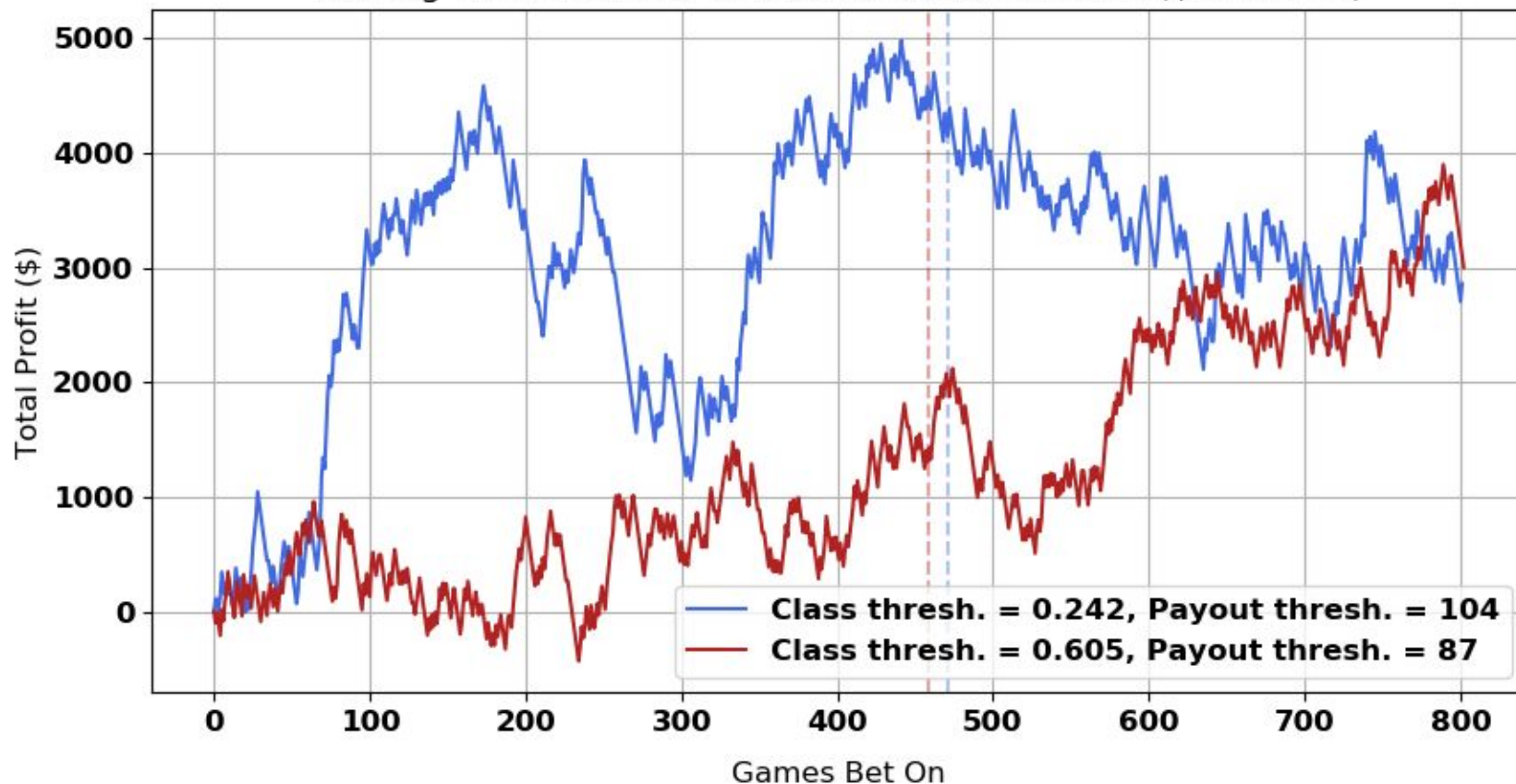
- Class Thresh: 0.2425
- Payout Thresh: 104
- Profit: \$13,218.00
- Exp Profit: \$9.84/bet
- # Bets : 1,343

Local Max:

- Class Thresh.: 0.605
- Bet Thresh.: 87
- Profit: \$4506.73
- Exp Profit: \$3.62/bet
- # Bets: 1,244

Betting Simulation

Betting Simulation for 2018 and 2019 Seasons (\$100 Bets)



Results/Conclusions

Strategy	Sim. Profit	Sim. Profit per Bet	Estimated Profit per Bet from C/B Analysis
Class Threshold: 0.242 Payout Threshold: 104	\$2,858.00	\$3.57	\$9.84
Class Threshold: 0.605 Payout Threshold: 87	\$3,002.12	\$3.74	\$3.62

- Past results don't always dictate future results
- A model predicting at ~ 61% accuracy can still be exploited for profit
- Cost/benefit can be more important than model accuracy.