



# NBA Draft Prediction

Leveraging college basketball statistics to predict the NBA draft pick

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## Introduction



### Problem to Address

How to predict NBA draft selections using college basketball player statistics

### Importance

Teams can develop more comprehensive strategies to acquire the best talent

### Background

**What:** Selection of players to join the NBA  
**When:** Annually every summer (June)  
**Who:** Individuals 19 or older  
**How:** Teams with worse records select first  
**Where:** Changes year to year

## Methods



### Exploratory Analysis

Understand the Landscape

### Classification

Predict the Lottery Selection

### Regression

Predict the Draft Pick Order

- Top Schools
- Draft pick correlation with key statistics
- Key statistic distributions by lottery type

- LDA
- QDA
- Logistic
- Random Forest
- Adaptive Boosting
- Bagging
- Gradient Boosting

- Linear
- Polynomial
- Random Forest
- Lasso
- Ridge

## Dataset & Exploratory Analysis



Pk	School	STL	BLK	TOV	PF	SOS	name	lottery
1	Kentucky	1.8	0.5	4	1.9	6.82	john wall	TRUE
2	Ohio State	1.6	0.7	3.5	2.7	7.86	evan turner	TRUE
3	Georgia Tech	0.9	2.1	2.5	2.6	9.02	denrick favors	TRUE
5	Kentucky	1	1.8	2.1	3.2	6.82	demarcus cousins	TRUE
7	Georgetown	1.5	1.5	2.9	2.5	9.26	greg monroe	TRUE
9	Butler	1.3	0.9	2	2.1	3.57	gordon hayward	TRUE
10	Fresno State	2	0.9	2.7	2.8	1.13	paul george	TRUE
11	Kansas	0.5	2.3	1.2	2.1	8.12	cole aldrich	TRUE
12	Kansas	1.5	0.5	1.9	1.8	8.25	xavier henry	TRUE
13	UNC	0.4	2.1	1.4	1.9	9.09	ed davis	TRUE
14	Kentucky	0.7	1.6	1.6	2.1	6.24	patrick patterson	TRUE
15	VCU	0.6	2.7	1.5	3.1	-0.69	larry sanders	FALSE
16	Nevada	0.9	0.8	2.1	2.2	1.98	luke babbitt	FALSE
18	Kentucky	1.4	0.3	3	2.2	6.82	eric bledsoe	FALSE
19	Texas	1.3	0.5	1.5	2.4	7.38	avery bradley	FALSE
21	Iowa State	0.5	1	2	2	7.34	craig brackins	FALSE

MODELING

- Historical college basketball statistics scraped from Basketball Reference
- Years: 2010-2021
- Dimensions: 415 Rows, 29 Columns

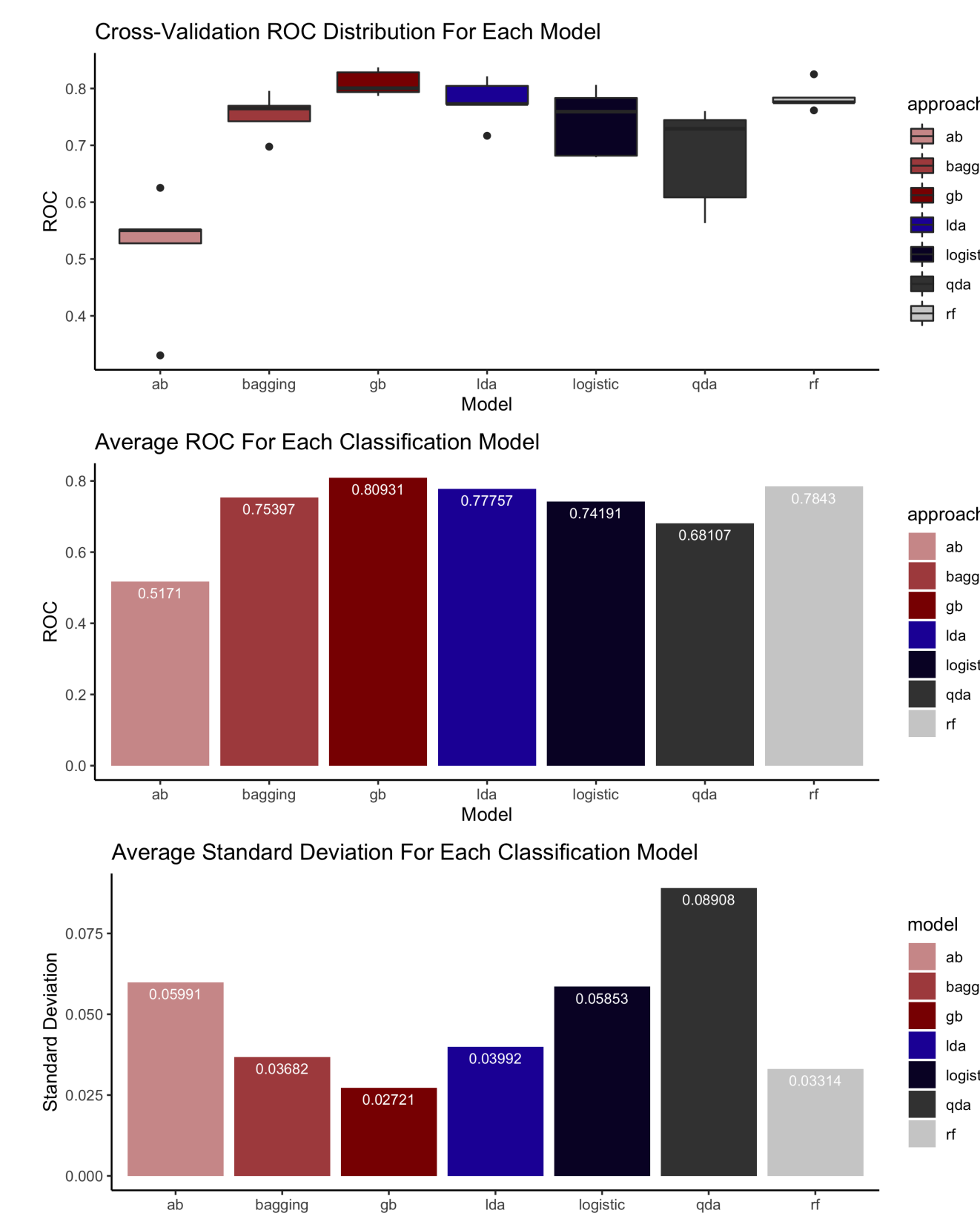
PROSPECT

- College basketball statistics scraped from Basketball Reference
- Years: 2021-2022
- Dimensions: 71 Rows, 26 Columns

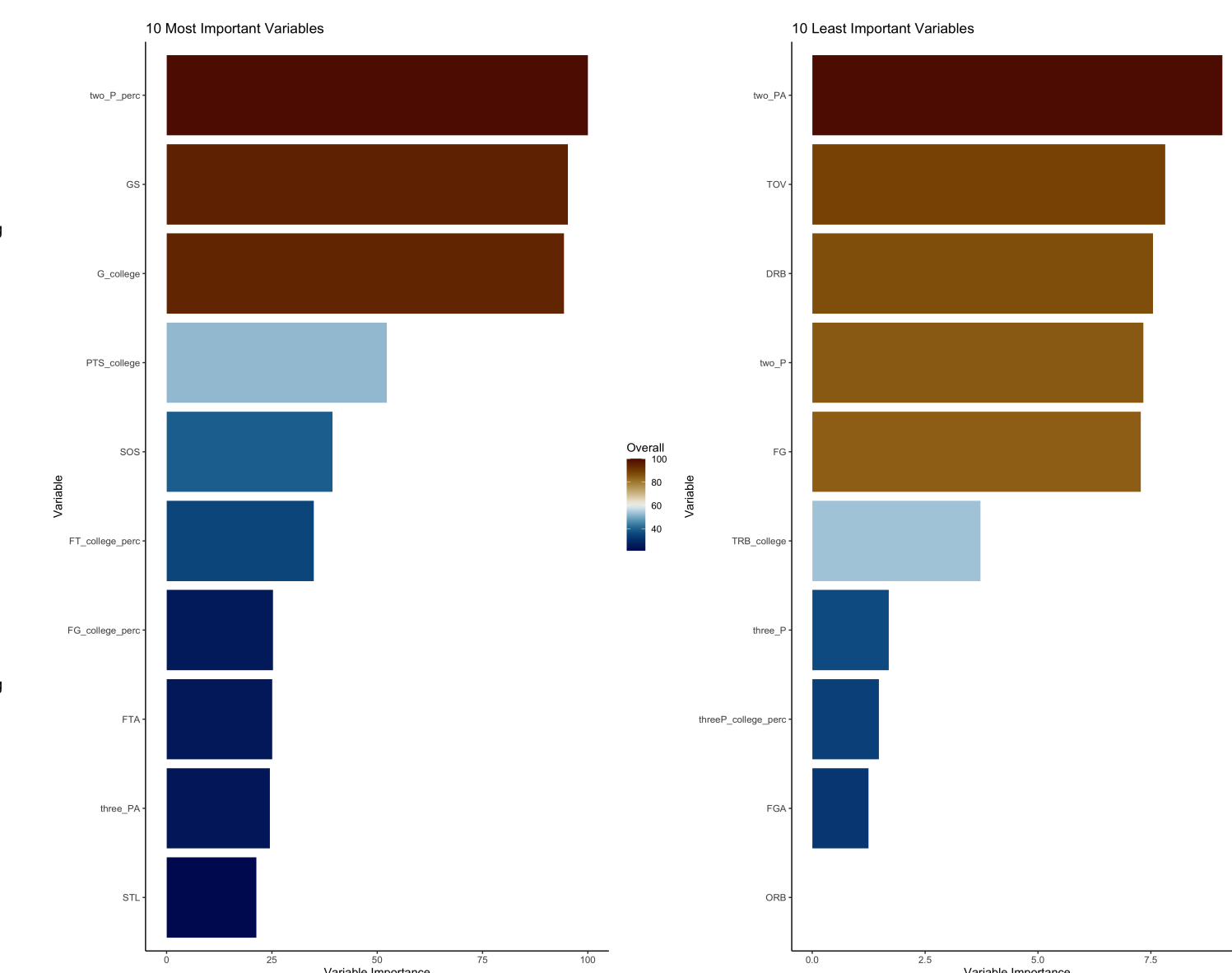
## Results



### Classification Model Comparison:



### Classification Feature Importance:



### Lottery Prediction:

	Prospect	Lottery_Probability
54	keon-ellis	0.915393
0	chet-holmgren	0.863053
37	bryce-mcgowens	0.862580
10	nolan-hickman	0.852826
20	keegan-murray	0.837418
6	jaden-ivey	0.785196
40	kofi-cockburn	0.705536
2	jalen-duren	0.675730
70	jeremy-sochan	0.650321
1	paolo-banchero	0.641342
73	jabari-smith	0.638466
34	malaki-branham	0.532393
4	aj-griffin	0.516619
9	kennedy-chandler	0.504911

### Statistical Analysis Summary:

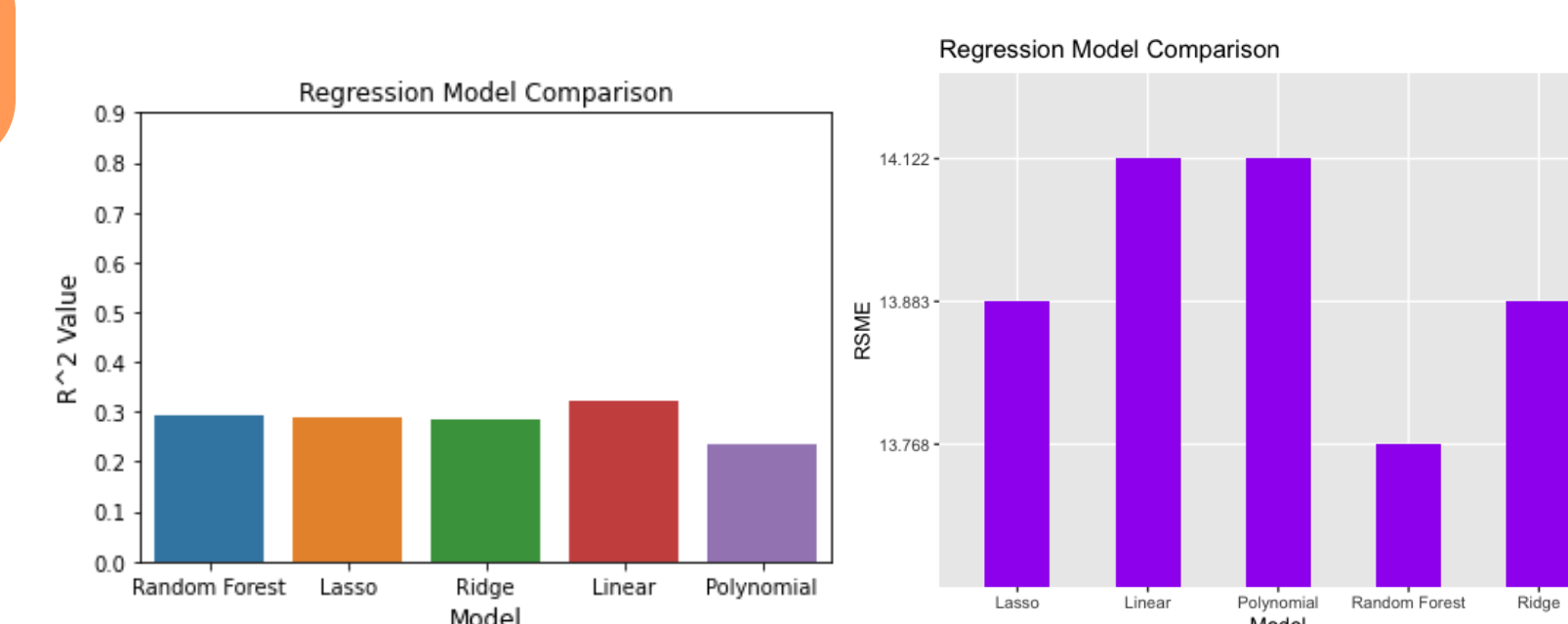
#### Regression

- Lottery, name, and school removed
- Missing values removed
- Regression models run with all variables
- Adjusted R2 and RMSE compared
- Optimal model selected
- Best subset selection to determine most significant variables
- Interaction terms added to improve accuracy

#### Classification

- Lottery, name, and school removed
- Missing values removed
- Lottery converted to factor
- 5-fold cross validation because of data size
- Random grid search
- Optimal model determined via accuracy and sd comparison
- Features extracted
- Prospects predicted

### Regression Model Comparison:



## Conclusions



1. Basketball statistics can accurately predict whether a player will be in the lottery
2. Games started, two point percentage, number of games are most important in lottery prediction
3. Basketball statistics cannot accurately predict draft pick order

## Future Directions

1. Assess NBA performance post-draft
2. Collect additional demographic information
3. Evaluate prospect predictions to actuals
4. Segment analysis by position

## Literature Cited

1. Wikimedia Foundation. (2022, April 1). NBA draft. Wikipedia. Retrieved April 24, 2022, from [https://en.wikipedia.org/wiki/NBA\\_draft#:~:text=The%20NBA%20draft%20is%20an,also%20eligible%20to%20be%20drafted.](https://en.wikipedia.org/wiki/NBA_draft#:~:text=The%20NBA%20draft%20is%20an,also%20eligible%20to%20be%20drafted.)
2. Basketball statistics and history. Basketball. (n.d.). Retrieved April 22, 2022, from <https://www.basketball-reference.com/>

