



Using Pre-NBA Draft Data to Project Early Success in the NBA



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Abstract

The National Basketball Association's (NBA) draft represents a unique challenge in that predicting a player's future success in the NBA is incredibly difficult. We seek to use machine learning techniques to quantify the attributes that tend to indicate a college player's playing ability in the NBA. Using historical data from players' college careers in combination with their NBA career data, we have developed a model to predict where a player should be drafted (if at all) in the NBA draft.

Methods and Materials

- Collect data via python based scraping algorithm
- Linear Regression
- SVM Classification
 - 2 classes – Starters (33%) vs. Non-starters (67%)
 - 3 classes – Starters (33%), Contributors (20%), non-Contributors (47%)
 - 5 classes – MVP (~1%), All-star (~5.5%), Starters (26.7%), Contributors (20%), non-contributors (46.7%)

Table 1. SVM success based on the number of classes

Number of classes	Prediction Accuracy (SVM)	Improvement over chance
2	70.4%	20.4%
3	51.20%	18.20%
5	48.4%	28.4%

Table 2. SVM success including PCA

Number of classes	Prediction Accuracy w/PCA	Difference from SVM
2	68.30%	-2.10%
3	48.90%	-2.30%
5	49.8%	1.5%

Results

College stats are not always good predictors of success in the NBA. Certain factors of college player's performance such as field goal percentage, minutes played, and points scored can indicate potential NBA success.

Figure 2. Linear Regression – comparing use of college and NBA data to predict Win shares

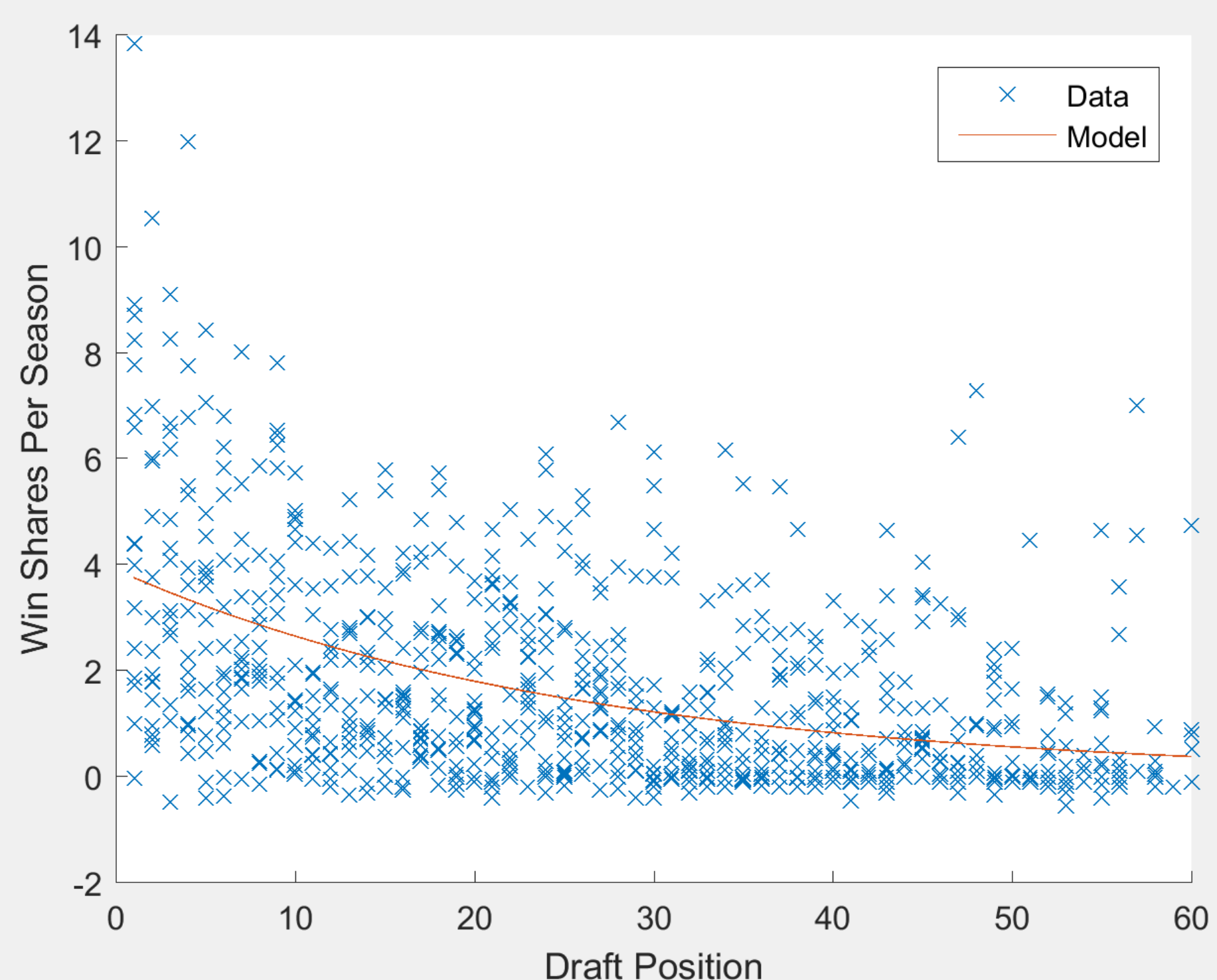
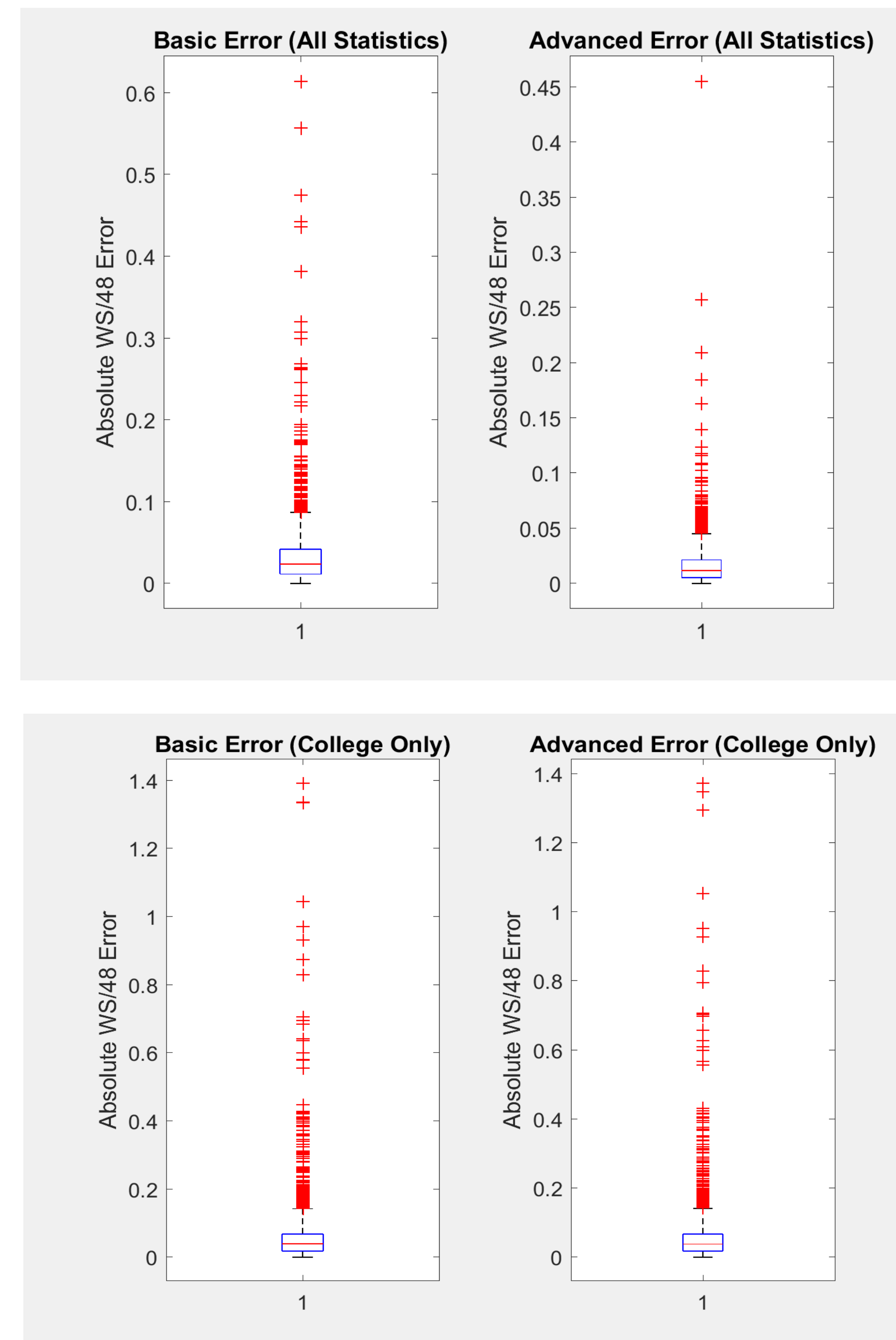


Figure 1. Raw data and exponential regression on win shares per season based on draft position.

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References

- [1] Basketball-Reference.com, 'Basketball-Reference.com', 2015. [Online]. Available: <http://www.basketball-reference.com/>. [Accessed: 07- Dec- 2015].
- [2] A. Ng, 'SVM Classification', 2015.
- [3] A. Ng, *Support Vector Machines*, 1st ed. Stanford university, 2015, pp. 1-25.
- [4] Crabdribbles.com, 'NBA Draft Over the Last 15 Years: A Statistical Overview', 2015. [Online]. Available: <http://www.crabdribbles.com/nba-draft-over-the-last-15-years-a-statistical-overview/>. [Accessed: 07- Dec- 2015].