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CSC 423
Final Projects

Predicting Win Shares for NBA Players

When evaluating NBA players, there are many easily accessible statistics and measurements to gauge the players' effectiveness. For reference, the highlighted statistics on ESPN.com's NBA Stats page are Points per game, Rebounds per game, Assists per game, Blocks per game, Field Goal Percentage, and Steals per game. Holistically, though, what every NBA Coach, Owner and General Manager are truly interested in is winning. Thankfully, some of the brilliant minds at basketball-reference.com and Dean Oliver, a statistician known as "godfather of advanced basketball stats", created the statistic Win Shares. Win Shares is an evaluative statistic, combining a player's offensive and defensive outputs to estimate each individual players' contribution to his team's wins. We were interested in creating a model to predict Win Shares based on all of the other parametric statistics available.

For our data set, we looked at a population of 492 NBA players who appeared in a game during the 2014-2015 season. After cleaning the data set and removing players who were missing key statistical information, we were left with a population of 414 NBA players. Included in our data set, and as a part of our original model were the per-game averages (Points per game, Rebounds per game, etc.), as well as some more advanced statistics, such as Offensive Rating (A measure of a team's offensive performance while a player is in the game, per 100 possessions) and Usage Rate (an estimate of the percentage of a team's plays used by a player while he is in the game).

We began our process in trying to predict Win Shares from 29 different variables, including those mentioned above. After performing some analysis, we were able to pare our model down to the eight most important variables that predict Win Shares. These variables were Games Played, Games Started, Free Throw Attempts per game, Assists per game, Blocks per game, Personal Fouls per Game, Offensive Rating, and Defensive Rating. As well, Personal Fouls per game and Defensive rating have a negative correlation with Win Shares, meaning that the more fouls a player commits or higher defensive rating a player has, the lower his win shares are.