

Kings Case Competition 2018

Welcome to the 2018 Kings Basketball Analytics Case Competition. Find all of the details for the competition below:

Timeline:

April 30: Submissions due

May 15: Winners announced

August 3: Winners (1 from each of the 2 problems) invited to present their work at CASSIS in Vancouver (small portion of travel support provided). Winners will also receive a Kings prize pack, TBD.

Teams:

Each school is welcome to have multiple teams compete, and teams are free to choose which problem to work on (but must stick to one). As an example, SFU might enter 3 teams in the competition, with 2 or even all 3 working on the same problem. Teams should be from 2 to 4 people in size, and an individual can only be on one team. Note that there are 6 schools in total involved (Harvard, SFU, Stanford, Berkeley, UC Davis, BYU).

The Competition:

Teams are free to choose which problem option (listed below) they want to tackle, but most only do 1 of the 2. Each team's final report is due to Luke Bornn (lbornn@kings.com) by midnight on April 30th. The report is to be a single pdf of at most 4 pages plus an appendix of up to 2 pages (for a total of at most 6 pages). Make sure your PDF report includes your team-members' names, as well as your school.

The 2 problem options listed below both rely on the same data:

https://www.dropbox.com/s/kvw4v7guhikx7b/case_competition_2018_final.zip?dl=0

The descriptions below are left intentionally open-ended, and teams may elect to address different angles of the underlying problem.

Evaluation:

Submissions will be evaluated on the following:

- Novelty – does the research provide interesting insights?
- Rigor/validity – Are the methods fundamentally sound and appropriate?
- Communication – Are the methods and results clear and well-presented?
- Impact – Can the results make an impact on a team, whether it be a coach, GM, scout, etc.?

Option 1: Lineup Confidence

Throughout any NBA season, coaches and teams will play hundreds of different lineup combinations over the course of 82 games. From a high level, NBA coaches are attempting to mix and match players to find the best on-court combination of players that leads to wins.

However, assuming a team's roster remains stable throughout the season, with 15 available players on a roster and only 5 that can play at once, a coach potentially has 3,003 different distinct lineups he could play, but only 3,936 regular season, non-overtime minutes at his disposal to find reliable lineups.

In addition, further complicating whether a lineup should play is the influence of recency bias. Did the lineup play well or poorly the last time they played?

In an effort to reduce overload, bias and speed up the decision making process, NBA team decision makers need to be able to objectively determine at what point their lineups become reliable on the court.

Using official NBA play-by-play data, create a method that measures how long a given 5-man combination of players needs to play together in a season for their on-court performance to become reliable enough to make a decision on whether the lineup should see continued minutes.

As part of your analysis, assume your audience is coaches and non-technical front office members. Come up with creative methods of communicating your results, such as impact on wins, etc., that may help decision makers be more objective in their analysis of lineup performance.

Things to consider in your analysis, but are not limited to, are total and consecutive minutes played, quality of time (garbage versus non-garbage time), age and veteran composition, contract value or some measure of player skill, lineup style and strength of opponent.

Option 2: Fouling Out

Early in the 2017-2018 season, Boston Celtics Head Coach Brad Stevens publicly discussed how he handles situations when his players pick up fouls, "I hated as a player worrying about getting a foul or breaking a rhythm of coming out." As he later described in the interview, Stevens believes the benefits of leaving a player on the court while in foul trouble outweigh the risk of the player picking up more fouls, getting further into foul trouble.

In basketball, coaches are faced with a conundrum when key players pick up quick fouls, pushing them closer to fouling out. It's a decision between keeping your best player on the court, maintaining a competitive edge or preserving his remaining fouls for later in the game. It's a decision coaches often decide based on past experiences in the moment without considering how their decision will impact the outcome of the game.

Using official NBA play-by-play data, develop a method to measure the decision a coach makes when he decides to keep or remove players from the game as they pick up each sequential foul with respect to winning the game.

As part of your analysis, creatively outline guidelines that could be presented to a head coach about how he or she should handle in-game player foul management. In this case, assume your audience is coaches and non-technical front office members. Come up with creative methods of communicating your results that may help a coach be more objective in their analysis of player foul management.

Things to consider in your analysis, but are not limited to, the probability a team wins at any given moment in game, the likelihood or duration until a player picks up his next foul, the opponent, the players on the court, player position and minutes played prior to each foul.