

## Two short stories about data and sports

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Recent advances in data collection, make sports an ideal testing ground for new analyses and algorithms. In this talk I will describe two studies that lie at the intersection of sports and data.

In most professional sports, every physical attribute of an athlete that can be measured is quantified and used to estimate athletic potential. However, coaches know that physical ability is only one piece of the puzzle; cognitive aspects of the game, including the ability to make sound decisions under pressure, play an important role in athletic success. In most games, these decisions manifest as physical actions that can be captured in tracking data. Here I will describe a framework for evaluating decision-making, while simultaneously making inferences around game strategy and execution efficacy. The framework is built on an Expected Possession Value (EPV) metric in basketball that is computed through tracking data that is then leveraged to identify scoring opportunities throughout a game. We analyze these opportunities as instances of decision-making and quantify the quality of these opportunities and how often they are missed. Looking at team opportunities as a whole and relying on the notion of expectation, we are able to determine how much of a team's performance can be attributed to their strategy versus their execution.

The second story explores the impact of opening NFL stadiums to fans during the pandemic. During the 2020-2021 season, each NFL team put forward their own plans and negotiated with the league, the relevant state, and their local community to determine whether they would be able to open the stadium to fans. Borrowing techniques from economics, we apply synthetic control methods to analyze covid case counts to determine whether opening stadiums has a detrimental, beneficial or neutral effect on the surrounding community.