

## March Madness Bracket Analysis Shows Picking Final Four First Leads to Better Brackets

ALEXANDRIA, Va. (March 4, 2020) — Data science researchers at the University of Illinois have some March Madness advice based on new research: Pick top-seeded teams as the Final Four in your March Madness bracket and work backward and forward from there. If you are going to submit multiple brackets—as you can in the ESPN, CBS Sports and Yahoo Challenges—starting with the Final Four is still a good strategy, but make sure you also diversify your brackets as much as possible.

A paper describing the research behind this advice is published in the American Statistical Association's (ASA) *Journal of Quantitative Analysis in Sports* (JQAS) by Sheldon H. Jacobson (computer science faculty), Ian Ludden (computer science graduate student), Arash Khatibi (former graduate student) and Douglas M. King (industrial and enterprise systems engineering faculty).

“If you can only pick one bracket, then leaning heavily on the top seeds makes sense,” said Jacobson. “However, all bracket challenges allow you to submit multiple entries. A person does not need all of their brackets to score well; just one will do.” Jacobson's research on basketball brackets over the past decade has focused entirely on seeds, not teams, making his body of seed-centered work distinct.

Given there are  $2^{63}$  possible brackets, which is more than 9 quintillion ( $9 \times 10^{18}$ ) combinations, picking a bracket with all 63 games correct is highly unlikely, even if you can submit multiple brackets. So, Jacobson suggests focusing on your Final Four teams first, and then building backward and forward from those games. “Once you pick a set of Final Four teams, 12 additional game outcomes become fixed, effectively reducing the number of games that you must pick,” Jacobson said. “Our research suggests that anything that can be done to reduce the uncertainty in your picks, while simultaneously expanding the diversity of your pool, will give you a step up in having a good scoring bracket amongst your set of brackets.” More information can be found on Jacobson's Bracket Odds website at

<http://bracketodds.cs.illinois.edu/pool.html>.

“For the 2016 through 2019 tournaments, our models produce many brackets that would have placed in the top 100 of the ESPN bracket challenge.” Ludden said. “Our models that start by picking the Elite Eight or Final Four teams perform especially well, perhaps because they balance the two main risks: incorrect picks in the first two rounds, which may propagate through the tournament, and incorrect teams in the later rounds, where each game is worth more points.”

Jacobson’s seed-centered research has been integrated into the Bracket Odds website. Launched in 2012, the website—labeled as a University of Illinois STEM Learning Laboratory—draws together graduate and undergraduate students to apply data science methods to the tournament. The site has attracted more than 650,000 hits since its inception, providing insights and information for those interested in the mathematics of March Madness.

The website offers a smorgasbord of data analytics for people following the tournament. For example, one of the website calculators gives the probability of all number-one seeds reaching the Final Four to be 0.0155, or around once every 64 tournaments. Meanwhile, the probability of a Final Four comprised of only No. 16 seeds—the lowest-seeded teams in the tournament—is so small that it has a frequency of happening once every 13 trillion tournaments. (For perspective, if an entire tournament was played once every second, the lowest-seeded teams would only meet in the Final Four approximately once every 433,000 years.)

Copies of the paper are freely available to reporters by contacting the ASA. Visit <http://bracketodds.cs.illinois.edu> to see the model in action.

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