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Computing Athletics

By Erika Jonietz November 2002

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One of the most influential people in U.S. sports doesn't play on, coach, or even own a team. Instead, he wields his sway from a computer in Bloomington, IN. Jeff Sagarin '70 has used his MIT math training to create algorithms that rank every team in the country in just about every high school, college, or professional sport—football, basketball, soccer, baseball, hockey, golf, and even stock car racing. The National Collegiate Athletic Association has used his rankings to help set the play-off schedule for the annual basketball championships since 1984 and to choose teams for college football's Bowl Championship Series since its inception in 1998. *USA Today* prints abridged versions of his rankings in its sports pages every week, making the full versions (which include computerized standings of every hitter and pitcher in Major League Baseball) available on its Web site.

Unlike most other college-sports rankings, which rely on polls and perceptions, Sagarin's are based solely on statistics that take into account not only win-loss records but also victory margins and a calculation of difficulty of schedule. His method, which sometimes results in an undefeated team's not being ranked number one, draws as much ire from sports fans as the traditional polls do.

"That causes huge controversies among fans, who send me really ugly e-mails," Sagarin says. But the self-styled "math sports prognosticator" has rigorously tested his algorithms, matching his rankings against results from seasons as far back as 1869. For more recent seasons, he runs the data through a particular point in the season and looks to see how well his rankings predict the winners of the next week's games. The results are always closer to reality than fans' (or often even experts') perceptions. "Reality always gives its own opinion," he says.



Sagarin began ranking teams when he was a fifth-grade sports fanatic, entering—but never winning—the weekly football contest in the *New York Daily News*. "At age 10, I'd have been ecstatic if I knew that this is what I was going to be doing," Sagarin says. By the time he was a junior in high school, Sagarin knew he loved math but hadn't really thought about going to college. A counselor at New Rochelle High School who helped him sign up for the SAT encouraged him to think about finding scholarship money to go to a school such as MIT. "To me it meant the best at math, so that's why I wanted to go," Sagarin says.

In 1966 he was accepted to the Institute, where he studied theoretical math. Although his career is in applied math, Sagarin credits his MIT education with teaching him plenty that he still uses in his work today. "You just learn a lot at MIT about how to work hard—that you should keep working at something until you get it right," he says. Following graduation, Sagarin did a brief stint in graduate school at Ohio State University, but he quickly figured out that it wasn't right for him. Before he left, however, he decided to take a shot at turning the sports-ranking system he'd developed as a hobby into a business. Advertising his prospective sports-ranking service, he sent out hundreds of letters to newspapers. One reporter called back: William Wallace, who was covering football at the *New York Times*. Wallace wrote a profile of Sagarin for *Pro Quarterback* magazine, and in the fall of 1972, he mentioned Sagarin to a contact at *Pro Football Weekly*. That publication bought Sagarin's ratings, and he says, "From that point on, things started happening." He's earned his living by ranking teams and players ever since.

In 1985 Sagarin got his really big break: *USA Today* started carrying his computerized standings. Until then, Sagarin had never owned a PC. When he started out, he had run his programs on a mainframe at MIT. And when he moved to Bloomington in 1977 after visiting an old MIT friend, Wayne Winston '71, a professor at Indiana University's Kelley School of Business, Sagarin made arrangements to use a university mainframe. But when *USA Today* demanded that he send in his weekly rankings via modem instead of overnight mail, Sagarin broke down and learned to use a PC and a modem. Even today, however, he favors DOS over Windows, still programs in Fortran, and has never used a word processor or spreadsheet, preferring to work in the old DOS text editor Edlin. He just doesn't see any reason to exchange what works well for newer, expanded technology that often ends up limiting what he can do.

Sagarin's newest venture, which he has undertaken with fellow Bexley Hall alum Winston, has the potential to transform the National Basketball Association (NBA). In 2000 Winston was at a Pacers-Mavericks game in Dallas when he spotted one of his former Indiana students, the Mav's new owner, Mark Cuban. Cuban offhandedly asked his erstwhile professor whether he would be able to find a way to help his team. Winston subsequently phoned Sagarin with an idea, and the two set out to create a program that would evaluate the contribution of every NBA player to his team's performance. Instead of looking at individual stats, Sagarin evaluates how well a team performs when a player is present versus when he isn't. "It's tricky," he says. "You're trying to solve for the individual effect of 481 different guys based on how the team as a whole is doing."

So far the Mavericks have bought the system and several other teams are considering it. Winston sees the program as a sort of insurance for teams that are considering trades or other multimillion-dollar decisions. "Sports is in the dark ages on trying to use information the way the rest of the world

For Sagarin, that would be the ultimate success. "He has a lot of the traditional qualities of an MIT student," says Winston, describing Sagarin as quirky, individualistic, and intense. But Sagarin's attitude toward life reflects both his MIT background and his passionate love of sports: "Show respect for your job. You have to know inside your own heart that you're giving it the absolute best effort you can."

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