



Finding a Fairer Way to Admit Students

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Jay Sethuraman began his career by matching sets of jobs with machines to improve factory performance. More recently though, he has used operations research to find the fairest way to admit students to top public high schools.

To Sethuraman, the two problems are similar, with one major exception: “In a factory, the machines don’t care what job they do. But schools do care about which students they admit,” he said.

New York City’s selective schools choose students based on admissions test scores. Students who do not get into their top choice can appeal. In fact, schools may set aside a certain number of seats for appeals, in addition to those seats lost when students they admitted leave for another school.

Resolving appeals fairly and efficiently discourages students from gaming the system, Sethuraman said. They may be willing to go to several schools, but list only one school if that increases their chance of placement. Or they may list schools that are unlikely to admit them if it improves their odds of getting into the school they want.

“A better system would give students an incentive to list their true preferences without penalizing them for doing it,” Sethuraman said. “We want to maximize the number of students who get into their top choice, but treat all students in a fair, systematic way.”

Under Sethuraman’s approach, each student starts with a seat in a school that he or she wants to trade. Rather than trade individual seats, students exchange their seat for a fraction of a seat in the schools they want to attend. Those fractions, which add up to a full seat, are computed based on seat availability plus the desirability of the student’s existing seat.

“At the end of this procedure, a student may have one-half a seat in school A, one-third a seat in school B, and one-sixth a seat in school C. This determines their probability of getting a seat in the lottery,” Sethuraman said. Students who do not complete a trade move onto the next round of lotteries, where their odds are reset to account for the remaining available seats.

“Listing all the schools you are willing to attend increases your chances of staying in the game longer and getting into a school you really want,” said Sethurman. “We give students an incentive to list all their acceptable schools without trying to game the system.”

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