

Center for Artificial Intelligence in Society presents...

Dr. Peng Shi

Prediction and Optimization in School Choice

In public school choice, students submit preference rankings for a given set of schools to the school board, which takes into account everyone's choices to compute the assignment. An important policy lever is what choice options to offer to each neighborhood, and how to prioritize between students. A key trade-off is between giving students equitable chances to go to the schools they want and controlling the city's school busing costs.

We study the optimization problem of choosing the choice menus and priorities for each neighborhood in order to maximize the sum of utilitarian and max-min welfare, subject to capacity and transportation constraints. The optimization is built on top of a predictive model of how students will choose given new choice menus, which we validate using both out-of-sample testing and a field experiment. Under a large market approximation, the optimization reduces to an assortment planning problem in which the objective is social-welfare rather than revenue. We show how to efficiently solve this sub-problem under various discrete choice models, and use this to produce better menus and priorities for Boston, which we evaluate by discrete simulations.



Thurs., Sept. 28th, 4-5 p.m.
Mudd Hall (MHP) 101

Dr. Peng Shi is an Assistant Professor of Data Science and Operations at the USC Marshall School of Business. He is interested in developing quantitative methodologies for the betterment of society. His current research focuses on optimization in matching markets, with applications in school choice, public housing, and online marketplaces. His research on school choice won multiple awards, including the ACM SIGecom Doctoral Dissertation Award, the INFORMS Public Sector Operations Best Paper Competition, and the INFORMS Doing Good with Good OR Student Paper Competition. Prior to joining USC, he completed a PhD in Operations Research at MIT, and was a postdoctoral researcher at Microsoft Research.