



RICE ECON

News and Views from the Economics Department at Rice

Economics Faculty Awarded NSF Grant

Congratulations to Professors Hülya Eraslan, Jeremy Fox, and Yinghua He, who have recently been awarded a National Science Foundation grant (in the amount of \$443,678) for a research project that investigates “Operationalizing Pseudo-Market Mechanisms: School Choice and Shared Office Allocation.” Working with Rice graduate student Yakym Pirozhenko, the team will investigate more complex structures for market mechanisms that are now used to solve matching problems, such as matching students to schools in systems of school choice or matching medical students to residency training programs.

Yinghua He notes that, “Matching market design is an exceptionally exciting research field. On the one hand, it combines knowledge from many fields, such as computer science, economics, mathematics, and operational research. On the other hand, it has been successful in the real world, assigning students to better schools, finding patients organs for transplantation, and in general finding ways to make the best use of limited resources.” Most current matching mechanisms utilize only a simple preference ranking from participants, such as a ranking by students of schools they would like to attend. However, Eraslan, Fox, and He are interested in a class of mechanisms that considers more specific information from participants, who would give not only a preference ranking but also provide information on the strengths of their preferences. As



Jeremy Fox, Yakym Pirozhenko, Hülya Eraslan, and Yinghua He

Jeremy Fox puts it, “We’re asking people to give us information about the intensity of their preferences, for example, are their first and second choices pretty close or is their first choice quite a bit better for them than their second choice?” While the basic concepts behind such mechanisms can be found in the existing economic literature, no one has yet implemented these principles in practice. The team will investigate whether the additional information on individual preferences provided beyond just a simple ordering of options results – as predicted – in improved and more efficient assignments of people to slots. Such systems also have other advantages, as they can take into account preference structures in which participants care not only about their own assignment but about the assignment of others, and can also allow

for different priorities in school choice. The team’s specific project will construct a simulated market in which these intensity preferences are registered without the use of money. A key factor will be the calculation of a competitive equilibrium, a problem that has practical obstacles, and the team plans to implement a new computational algorithm to find equilibria in these markets. Their approach will also take into account the possibility of coordination by students in stating their preferences. The Economics Department research team has already put the ideas behind their project into practice by using their methodology to assign offices to Economics PhD students, and they will also be implementing their approach to the problem of assigning rooms to students at Wiess College for the next academic year.