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Stable Solutions for Kidney Exchanges

Tuesday, September 24, 2024 4:15 PM (45 minutes)

In this talk we will survey the main results of three recent papers on stable solutions for kidney exchange programmes (KEPs). These programmes have been established in most of the developed countries in the world during the last two decades to facilitate the exchange of living kidney donors for those recipients who have willing but immunologically incompatible donors. The UK has the largest KEP in Europe, where optimal solutions with 2-cycles, 3-cycles and altruistic chains are computed for about 300-400 registered pairs in every three months. The concept of stability (or core in the corresponding cooperative game) is an alternative approach, that can provide group fairness and good incentives for the recipients to bring more valuable donors or multiple registered donors to the pool. In this talk, besides some new theorems on the so-called respecting improvement property, we will present novel IP techniques for computing stable (core) solutions for bounded and unbounded exchanges. Furthermore, we will show simulation results on the price of stability, and on the question to what extend the respecting improvement property holds for various solution concepts regarding the stability and optimality requirements.

Presenter: BIRO, Peter (HUN-REN KRTK)

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