ECON 558: MATCHING AND ASSIGNMENT

- Instructor: SangMok Lee
- Class time: Thursday, 2:30pm - 5:30pm

This course introduces you to formal modeling in two-sided matching and assignment problems and suggests some interesting directions for future research. We will discuss decentralized matching markets (e.g., the marriage market), matching markets through institutions (e.g., medical match and school choice problem), matching with transferable utilities (e.g., labor markets), and assignment problems (e.g., housing allocation). We study existing or new market institutions, understand their properties, and think about whether they can be reengineered or improved.


1. Requirements

The grade will be determined by assignments, one exam, and an individual paper:

(1) Two homework assignments.
(2) One exam: March 29th. In Class.
(3) Individual papers by May 15th.

**Option 1: A ~15 page research paper.** This should outline a question, its context in the literature, why it is important, and some preliminary results. If your project is theoretical in nature, you should sketch a model and provide some basic insights from the model. If it is empirical, you should describe precisely the data sources you will be using and empirical techniques you plan to utilize.

**Option 2: Two referee reports on recent working papers:** Each report should be 2-3 pages (1.5 line spaced, 11 pt fonts). The reports should start off with a short summary of the articles. You should describe your main 3-4 points in detail and conclude the report with more minor comments. A good referee report not only clearly states the shortcomings of the work, but also lays out constructive, detailed and realistic suggestions for improvement.

2. Textbook

(1) A self-contained note will be distributed time to time during class.

Date: Fall 2017.
3. Topics

3.1. Basic Theory of Two-sided Matching.

(1) Matching with Non-transferable Utilities, Stability and the Gale-Shapley algorithm:
   Roth-Sotomayor (chapter 2)

(2) Many-to-one Matching:
   Roth-Sotomayor (chapter 5)

(3) Matching with Transferable Utilities (a.k.a. Assignment Game)
   Roth-Sotomayor (chapter 8)

3.2. The Structure of The Set of Stable Matchings.

(1) The Structure and Computation of Stable Matchings
   Roth-Sotomayor (chapter 3)

(2) Lattice, Tarski’s Fixed Point Theorem

(3) Linear Programming Approach

Teo, Chung-Piaw, and Jay Sethuraman. ”LP based approach to optimal stable matchings.” (1997).


(4) The Structure of Stable Matchings with Transferable Utilities
   Roth-Sotomayor (chapter 8)

3.3. Mechanism Design Aspects of Matching.

(1) Stable Matching Mechanisms

(2) Strategic Issues
   Roth-Sotomayor (chapters 4 and 5)


(3) Unraveling


(4) Application I: National Resident Matching Program

(5) Application II: Public School Choice Programs


(6) Applications III: Others.


Sonmez and Switzer (2013) on Cadet-Branch Matching (see the next topic)


3.5. Random Assignment Problems and Applications.

(1) Theory


(2) Applications: Housing Allocation, Kidney Exchange.


(1) Large Two-sided Matching


SangMok Lee, Incentive Compatibility of Large Centralized Matching Markets, mimeo.


Menzel (2014) and Peski (2015) (see the topic of empirical analysis)

(2) Large Assignment Problems


Liu, Qingmin, and Marek Pycia. "Ordinal efficiency, fairness, and incentives in large markets.” mimeo.


3.7. Matching in Related Fields.

(1) Empirical Analysis: Classic


Fox, Jeremy (2009), Estimating Matching Games with Transfers, mimeo.


(2) Lab Experiments


(3) Macro/Labor Econ: Search and Matching


3.8. Other Topics.

(1) Affirmative Actions


(2) Stability and Efficiency


(3) Dynamic Matching


Akbarpour, Mohammad, Shengwu Li, and Shayan Oveis Gharan. "Dynamic matching market design.” Available at SSRN 2394319 (2014).


(4) Pre-matching Decision Making

(References in Matching with fully non-transferable utilities only. Prof. Mailath will cover pre-investment for the case of transferable utilities.)


Hatfield, John William, Fuhito Kojima, and Yusuke Narita. "Promoting school competition through school choice: A market design approach.” Available at SSRN 1984876 (2012).

Incentives to Learn as a Criterion for Allocation Rules, Patrick Harless and Vikram Manjunath), mimeo, 2015.

(5) And More Developments in Theory


Che, Yeon-Koo, Jinwoo Kim, and Fuhito Kojima. Stable matching in large economies. mimeo, 2013. (Complementarities, Peer effects).

Nguyen, Thanh, and Rakesh Vohra. ”Near feasible stable matchings with complementarities.” (2014). (Complementarities, Peer effects, Couples in NRMP, etc)
More Recent Papers in Empirical Analysis


Marcin Peski, Large roommate problem with non-transferrable random utility, mimeo, September 2015.


