Personal Information

Xinlu Yao
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EDUCATION

Ph.D. Economics, University of Maryland at College Park, Expected 2020
GPA:4.0/4.0
M.A. Economics, Renmin University, China, 2015
Visiting Student, Economics Department, Stanford University, 2014
B.A. Economics, Sun Yat-sen University, China, 2012
Minor, Statistics, Sun Yat-sen University, China, 2012

FIELDS OF SPECIALIZATION

Primary: Industrial Organization
Secondary: Market Design and Applied Microeconometrics

WORKING PAPERS

"Dynamic Oligopoly Pricing with Asymmetric Information", with Andrew Sweeting

WORKS IN PROGRESS

"When Multiple Selling Mechanisms is Better? Design of Online Tickets Resale Platforms"
"Exploiting Customer's Awareness: Expedia's Listing Strategy," with Santiago Velez
"Competition with Learning-By-Doing and Strategic Buyers," with Andrew Sweeting, Hui Shen and Calvin Jia
"Bidding Strategies in a Multi-Unit Uniform-Price Auction With Its Uncertain Resale Market"

RESEARCH AND WORK EXPERIENCE

Research Assistant, Andrew Sweeting, University of Maryland, Summer 2016- present
Summer Intern, Power Auctions LLC, Washington D.C., Summer 2016
Research Assistant, Yingyao Hu, Johns Hopkins University, 2014 Summer

TEACHING EXPERIENCE

Teacher Assistant, Principles of Microeconomics, University of Maryland, 2016-Spring 2017
Teacher Assistant, Microeconometric Models with Unobservables, Renmin University, Summer 2014
Dynamic Economics by Prof. Chao He, Renmin University, China, Fall 2013

GRANTS AND AWARDS

"eBay Policy Scholar Program", 2017
"Guanghua Scholarship of Renmin University" (1%), 2013
"Excellent Graduate Student of Hanqing Institute", 2013

CONFERENCE AND WORKSHOP

June 2017: "Dynamic Programming and Structural Estimation" (GCEP Masterclass by John Rust)
September 2016: "Machine Learning for Treatment Effects and Structural Equation Models" (GCEP Masterclass by Victor Chernozhukov)
2016: AEA Annual Meeting
2011: Chinese Econometrics senior seminar

TECHNICAL SKILLS

Computer Languages: MATLAB, Stata (advanced)
Fortran, R (median)
Python, C/C++ (basic)
Spoken Languages: English (fluent), Chinese (native)

Courses and Experience

In my undergraduate I have taken main courses of economics and statistics. I did some research using treatment effect model and took the nonparametric course for graduate students. In my master's program, I have learned more advanced knowledge of econometric theory and industrial organization. In the second year of my master's program, I visited Stanford University. During that period, I took the graduate econometrics and IO courses in Stanford. Also, I took the market design course by Professor Jon Levin. After that, I did some research related to the measurement error model with Professor Yingyao Hu (JHU).

During the first two years of my PhD program, I took almost all the courses related to industrial organization, micro theory and econometrics, and performed well in these courses. In the first year, I took the three main principle courses: Advance Microeconomics, Advance Macroeconomics and Econometrics. To learn more about the auction mechanism in practice, I did an internship in Professor Ausubel's Power Auction LLC after my first year. In my second year, I took many courses to solidify my knowledge of micro theory and empirical methodology. For the theoretical part, I took the two-semester sequence course in Advanced Microeconomics given by Professor Peter Cramton and Lawrence Ausubel. These courses first gave me a formal treatment of game theory, then focused on topic related to market design, such as auction theory and matching theory. To learn more IO theory, I took the Theories of Industrial. For the empirical part, I took the computation course by Professor Andrew Sweeting and an advanced numerical optimization course in CS department. From Sweeting's courses, I learned a lot computation method and structural estimation method related to topics in IO. Besides, I also took the Advance Microeconometrics, which focus discrete response model and nonparametric estimation. As an extension, I also took the Decision Theory and Experimental Economics in my second year. Except the courses given by my department, I took two GCEP masterclass: one is a Machine Learning course taught by Professor Victor Chernozhukov and one is about dynamic programming and structural estimation given by Professor John Rust.

Since my second year, I have engaged in many projects with Sweeting. Through these projects, I am more familiar with many advanced computation methods and structural estimation experience, such as numerically solve complicated dynamic games and market power analysis in many industries. Besides the collaboration with Sweeting, I have successfully applied Expedia's hotel search data and eBay's tickets resale data from WCI and eBay's policy scholarship respectively. I am focus one these two projects now.

Research Interests

Primarily, I hope my current and future research can focus on empirically assessing the practical market mechanisms, especially about online market. I think this topic is not only very important, but also can perfectly combine my knowledge of IO, econometrics and market design. In particular, after learning the specific mechanism of the market, I will model the individual's rational behavior and the market equilibrium in an abstract version of the market environment. Then, using the detailed market data, I can estimate the preference and other parameters that rationalize the individual's behavior. By doing counterfactual analysis utilizing the estimated preference and parameters, I can construct a potential efficient market. By comparison of the constructed and real market, I can recognize the problems of the existing market mechanism. Finally, I will discuss how the market mechanism can be altered to improve the efficiency.

By far, I have some work in progress related to dynamic pricing mechanisms, searching and matching. Two application I am doing now is online tickets resale market and online hotel search system.

Besides the analysis to some specific mechanisms, I also have some projects, with Professor Andrew Sweeting, related to the general price and quantities competition models in a dynamic oligopolistic framework. Some topics I am working on now include the merger effect analysis when firms use dynamic pricing to signal their costs, and how the industry structure and dynamics evolve if we take learning-by-doing, organizational forgetting and strategic consumers into accounts.

Working Papers and Works in Progress

"When Multiple Selling Mechanisms is Better? Design of Online Tickets Resale Platforms"

Perishable goods, such as sports tickets, are often sold by various dynamic mechanisms. Different platforms prefer to implement different policies for the selling mechanisms in practice. For example, eBay allows for both sequential auctions and dynamic posted prices, but StubHub only permits dynamic posted prices. In this paper, I analyze when the multiple dynamic mechanisms will be beneficial an online tickets resale platform and when dynamic posted price is better. To achieve this, I comprehensively model buyers' participation and bidding strategies as well as sellers' dynamic pricing strategies and mechanism choices in this environment. The model takes into account the participants' heterogeneous preferences, such as patience level and risk aversion as well as the platform characteristics, such as search cost. In this framework, using the estimated results from real market data (eBay and StubHub), I can simulate how participants would change their decisions under alternative selling mechanism policies and examine the potential welfare gain/loss from the coexistence of different dynamic selling mechanisms on one platform.

"Exploiting Customer's Awareness: Expedia's Listing Strategy", with Santiago Velez
Consumer purchase decision are known to be complex multi-stage processes: awareness, consideration and purchase. This project proposes to model and estimates this type of decision process focusing on how consumers gather information using Expedia's data on click-throughs and purchases of hotel rooms. In the model and empirical part, we pay much attention to how consumers construct their awareness set. We believe that our more comprehensive approach could allow platforms like Expedia to maximize revenues more effectively, and provide new insights into consumers' behavior.

"Dynamic Oligopoly Pricing with Asymmetric Information", with Andrew Sweeting
Existing theoretical and structural analyses of mergers in differentiated product markets assume that firms have complete information about both their own and their rivals' demand and marginal costs. While the complete information assumption simplifies the analysis, we show that equilibrium price levels may change significantly when there are small amounts of asymmetric information about serially-correlated marginal costs, as firms may have incentives to raise their prices in order to signal their costs, and therefore the likely level of their future prices, to competitors. We show that signaling effects could lead merger simulations that assume complete information to under predict post-merger price rises quite significantly, and that they are also capable of explaining the magnitude of price increases often observed after actual mergers.

"Competition with Learning-By-Doing and Strategic Buyers", with Andrew Sweeting, Hui Shen and Calvin Jia

Based on Doraszelski et al. (2010), the paper provides a general model of dynamic competition that accounts for learning-by-doing, organizational forgetting and strategic consumers, and show how they shape industry structure and dynamics. Using homotopy method, we show if consumers can response to the price strategically, the model will not give rise to multiple equilibria.