

Xinyu Cao

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EDUCATION

- | | |
|----------------------|---|
| 2013-2018 (Expected) | Massachusetts Institute of Technology
MIT Sloan School of Management
Ph.D. Candidate in Marketing |
| 2011-2013 | University of California, Berkeley
Department of Industrial Engineering and Operations Research
M.S. in Operations Research |
| 2007-2011 | Tsinghua University
Academic Talent Program
B.S. in Mathematics in Physics |

RESEARCH INTERESTS

- Substantive: Market Research, Digital Marketing, Social Media, Emerging Markets
- Methodology: Field Experiments, Applied Game Theory, Structural Modeling

WORKING PAPERS

- “Prelaunch Demand Estimation”
Xinyu Cao and Juanjuan Zhang. Job Market Paper
- “Cooperative Search Advertising”
Xinyu Cao and Tony Ke. *Marketing Science*, revise & resubmit
- “Rational Spamming”
Xinyu Cao, John Hauser, Tony Ke, and Juanjuan Zhang. To be submitted to *Marketing Science*

PUBLICATION

- “Stochastic Control for Smart Grid Users with Flexible Demand”
Yong Liang, Long He, Xinyu Cao, and Zuo-Jun Max Shen. *IEEE Transaction on Smart Grid*, Vol. 4, No. 4, Dec. 2013.

WORK IN PROGRESS

- “The Sound of Music” (with Teck Ho, Saiquan Hu, and Juanjuan Zhang)
- “Referral Programs: What Works Best and Why” (with Xiaojing Dong and Liwen Hou)

TEACHING EXPERIENCE

MIT Sloan School of Management

Teaching Assistant

Marketing Management (EMBA), Fall 2015

Marketing Strategy (EMBA), Winter 2015, Winter 2016, Winter 2017

Pricing (EMBA), Winter 2016

Entrepreneurial Marketing (MBA), Spring 2016

Product Management (MBA), Spring 2016

University of California, Berkeley

Graduate Student Instructor

Applied Stochastic Processes (Graduate core), Fall 2012

Operations Research II (Undergraduate core), Spring 2013

GRANTS, HONORS AND AWARDS

MIT

AMA-Sheth Foundation Doctoral Consortium Fellow, 2017

ISMS Doctoral Consortium Fellow, 2014, 2016

Quantitative Marketing and Structural Econometrics Workshop Fellow, 2015

MIT Sloan School of Management Fellowship, 2013-2018

University of California, Berkeley

Industrial Engineering and Operations Research Department Fellowship, 2011-2012

Tsinghua University

National Motivational Scholarship--1st Award for Academic Excellence, 2008, 2010

Tsinghua--COSL Scholarship, 2009

1st Scholarship of Science and Technology, 2009

Meritorious Prize in the Mathematical Contest in Modeling, U.S., 2009

High School

First Prize in National Mathematics Olympiad, 2005, 2006 (Ranked 1st in province)

Silver Medal in China Girls' Mathematics Olympiad, 2006

Silver Medal in China Western Mathematics Olympiad, 2005

CONFERENCE AND SEMINAR PRESENTATIONS

“Prelaunch Demand Estimation”

AMA-Sheth Foundation Doctoral Consortium, Iowa City, IA, 2017

“Rational Spamming”

15th Annual International Industrial Organization Conference, Boston, MA, 2017

Marketing Science Conference, Shanghai, China, 2016

MIT Sloan Marketing Seminar, 2015

GRADUATE COURSEWORK (IN CHRONOLOGICAL ORDER)

Economics

Microeconomic Theory I, II

David Ahn (UC Berkeley)

Microeconomic Theory III, IV

Haluk Ergin, Benjamin Hermalin (UC Berkeley)

Econometrics I

Anna Mikusheva (MIT)

Econometrics II

Jerry Hausman (MIT)

Applied Econometrics	Josh Angrist (MIT)
Econometric Methods	Mikkel Plagborg-Moller (Harvard, Audit)
Industrial Organization Theory	Glenn Ellison (MIT).
Empirical Industrial Organization	Paulo Somaini (MIT)
Computational Economics	Che-Lin Su (Harvard)
Contract Theory	Philippe Aghion (Harvard)
Psychology and Economic Theory	Matthew Rabin (Harvard)
Behavioral Decision Theories and Applications	Karen Zheng (MIT)

Marketing

Discrete Choice Modeling	Minjung Park (UC Berkeley)
Quasi-Experimental Methods	Catherine Tucker (MIT)
Experiment Design	Dean Eckles (MIT)
Directions in Consumer Research	Joshua Ackerman, Drazen Prelec (MIT)
Social Influence	Juanjuan Zhang (MIT)
Decision Heuristics and Machine Learning	John Hauser (MIT)
Analytical Modeling	Tony Ke (MIT)
Developing Research Ideas	Birger Wernerfelt (MIT)

Operations Research, Statistics, Machine Learning, Networks

Mathematical Programming I, II	Dorit Hochbaum, Shmuel Oren (UC Berkeley)
Applied Stochastic Processes I, II	Rhonda Richter, Andrew Lim (UC Berkeley)
Supply Chain Management	Zuo-Jun Max Shen (UC Berkeley)
Applied Dynamic Programming	Ying-Ju Chen (UC Berkeley)
Machine Learning	Tommi Jaakkola (MIT)
Bayesian Statistics	Jun Liu (Harvard)
Software Tools for OR	Operations Research Center (MIT)
Applied Network Theory	Sinan Aral (MIT)

ABSTRACTS OF WORKING PAPERS

Prelaunch Demand Estimation (with Juanjuan Zhang), Job Market Paper

Demand estimation is important for new product strategies, but is challenging in the absence of actual sales data. We develop a theory-based, cost-effective method to estimate the demand for new products using choice experiments. Our premise is that there exists a structural relationship between manifested demand and the probability of consumer choice being realized. We illustrate the mechanism using a theory model, in which consumers learn their product valuation through costly effort and their effort incentive depends on the realization probability. The theory predicts that as the realization probability increases, the demand curve gets steeper.

We run a large-scale choice experiment on a mobile game platform, where we randomize the price and realization probability of a new product. For a consumer that faces price p and realization probability r , if she indicates that she is willing to purchase the product, we will run a lottery and there is probability r that she will get the product and pay p ; otherwise, she cannot get the product and will not be charged. We find reduced-form support of our theoretical hypothesis, and the underlying mechanism is also supported as the measures of consumers' effort increase with the realization probability. We then estimate a structural

model of consumer choice using data from the subsample of smaller realization probabilities, leaving the 1-probability group as the holdout sample. The structural estimates allow us to infer the actual demand with high accuracy.

Cooperative Search Advertising (with Tony Ke), *Marketing Science*, revise & resubmit

Channel coordination in search advertising is an important but complicated managerial decision for both manufacturers and retailers. A manufacturer can sponsor retailers to advertise its products while at the same time compete with them in position auctions. We model a manufacturer and its retailers' cooperation and intra-brand competition in search advertising, incorporating inter-brand competition with other advertisers as well. We consider a simple coordination mechanism where a manufacturer shares a fixed percentage of a retailer's advertising cost. Our model prescribes the optimal cooperative advertising strategies from the manufacturer's perspective. We find that it may not be optimal for a manufacturer to cooperate with all of its retailers, even when they are ex ante the same. This reflects the manufacturer's tradeoff between larger demand and higher bidding cost caused by more intensified competition. With two asymmetric retailers, the manufacturer should support the retailer with the higher channel profit per click to get a higher position than the other retailer. The manufacturer should take a higher position than a retailer when its profit per click via direct sales exceeds the channel profit per click of the retailer. We also investigate how a manufacturer uses both wholesaling and advertising contracts to coordinate channels with endogenous retail prices.

Rational Spamming (with John Hauser, Tony Ke, and Juanjuan Zhang)

Advertising on social media faces a new challenge as consumers can actively choose which advertisers to follow. A Bayesian learning model suggests that consumers with limited attention may rationally choose to unfollow a firm. This happens if consumers already know enough about the firm's value and if the firm advertises too intensively. However, firms might still find intensive advertising to be the optimal strategy. If a firm is perceived as having a lower match value, it wants to advertise aggressively to change consumers' beliefs about its value; if a firm is perceived as having a higher match value, it also wants to advertise intensively, but in an effort to crowd-out advertising messages from its competitors. Tracking company accounts of 49 TV shows on the most popular tweeting website in China provides empirical evidence that both popular and non-popular firms advertise intensively, although the number of followers goes down when a firm advertises too intensively.

REFERENCES

Tony Ke

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Juanjuan Zhang (Chair)

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International Management
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Birger Wernerfelt

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