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Lei HUANG

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ACADEMIC DEGREES

Massachusetts Institute of Technology

- Ph.D. in Management 2027 (expected)
 - M.S. in Management 2024
- Committee: Professors Juanjuan Zhang (Chair), John Hauser, Rahul Bhui

Tsinghua University

- M.A. in Economics (Ranking: 1st / 1,111 in class) 2020
- B.S. in Information Management and Information Systems 2017
- B.A. in Law 2017

INDUSTRY EXPERIENCE

- Machine Learning Research Intern at Tencent America 2023-2025
- Applied Research Intern at VipKid 2019

RESEARCH

Research Interests

- AI, machine learning, economic theory, field experiments, deployment

Working Papers

1. Lei Huang and Juanjuan Zhang, “Designing Self-Sustaining Markets: An Application to Content Platforms” [**Job Market Paper**]
 - Deployed as the default content recommender system for Tencent WeChat
 - Sheth Foundation ISMS Doctoral Dissertation Award (2026)
 - American Marketing Association TechSIG Doctoral Student Award (2026)
 - Abstract: When supply incentives are driven by demand, the natural force of the market may suppress the provision of products that are valuable to some consumers, leading to market failure. This paper explores a solution. Focusing on content platforms, we design a recommendation mechanism that maximizes total user utility by strategically allocating demand to sustain valuable content production. Theoretically, we prove that the optimal

recommendation mechanism considers not only consumption utility, as in standard recommender systems, but also creator sensitivity, which captures how easily a creator can be incentivized by demand, and creator contribution, which reflects a creator’s importance to users overall. Computationally, we develop PIXSET, a novel data transformation framework that converts variable-length sets (e.g., numbers of creators of various types) into fixed-size tensors (e.g., density distribution over pixels in a type space), which simplifies estimation as a computer vision problem with 99.9% gain in computational efficiency. The proposed recommendation mechanism is validated by both an observational-data analysis and a field experiment on Tencent WeChat, one of the world’s largest content platforms. This mechanism has since been deployed as the default recommendation system at WeChat, serving billions of users and tens of millions of creators each day.

2. Lei Huang, “Network Recovery from Cascade Data: A Debiased Jacobian-Based Machine Learning Approach” [\[Paper\]](#)

- Abstract: Many important outcomes unfold as dynamic cascades, including product adoption, disease spread, financial distress, and information diffusion. A central challenge is to recover the hidden influence network behind these cascades. Existing methods typically assume a specific diffusion model, and their performance degrades substantially when that assumption is misspecified. We propose *CascadeNet*, a Jacobian-based machine learning framework for network recovery that does not require specifying a diffusion mechanism. The key idea is that the underlying influence structure can be characterized by the Jacobian of the one-step transition function. CascadeNet first constructs a flexible estimator of the transition function, and further applies Neyman-orthogonal debiasing via the Riesz representer, so that the debiased Jacobian is $\sqrt{n}$ -consistent and asymptotically normal, enabling formal inference on the network structure. We validate CascadeNet in both a simulation exercise and a real-world empirical application. In simulations, where the data-generating process is known, CascadeNet achieves the highest network recovery accuracy across nine common data-generating processes. In an empirical application to COVID-19 transmission across Spain’s 52 provinces, CascadeNet recovers transmission networks that are significantly correlated with the true inter-province mobility network, whereas networks recovered by baseline methods show no significant alignment with the ground truth.

3. Nan Chen, Lei Huang, Zemin (Zachary) Zhong, “Experience and Identity-driven Consumer Choice: Evidence from China’s Cultural Revolution” [\[Paper\]](#)

- Abstract: Consumers use brands to express who they are, yet it remains unclear how the cultural identities that drive brand choices are formed and under what conditions these identities are activated in the marketplace. We address both questions using China’s Cultural Revolution (CR, 1966–1976) as a natural experiment in identity formation and the 2012 China–Japan territorial conflict as an identity activation event. Drawing on social identity theory and identity salience theory, we propose and test a two-stage framework: the CR forged a latent national identity schema during individuals’ impressionable years, and the 2012 conflict activated this dormant identity to influence consumer brand choices. Using a generalized difference-in-differences design that exploits cohort and spatial variation in CR exposure, we analyze over 10 million individual vehicle purchases (2012–2013)

in China. We find that consumers with more intense CR exposure are more likely to choose Chinese brands, but only after the 2012 China–Japan conflict activated their dormant national identity. This activation effect persists for over 15 months and is stronger for culturally symbolic brands and higher-priced vehicles, where self-expressive motives are most salient. We rule out alternative mechanisms, including social norm compliance and targeted boycott. Our findings provide evidence on how formative political experiences create durable identity schemas and how contemporary geopolitical events activate these identities to shape consumer brand choices.

Publications

4. Lei Huang and Juanjuan Zhang, “Theory Instead of Experiment (TIE): A Creator Valuation System at Tencent,” *Proceedings of the 31st ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, pp. 4522-4532. 2025. [\[Paper\]](#)[\[Video\]](#)
 - Deployed as the default creator valuation system for Tencent WeChat
 - 2025 KDD Audience Appreciation Award (February Round)
 - Abstract: Experiments are informative but should be used judiciously as a costly resource. Well-constructed theory may serve as a substitute. We develop a “Theory Instead of Experiment” (TIE) framework and, in collaboration with Tencent, apply the framework to assess how much value (e.g., user clicks) each creator contributes to its WeChat Official Accounts Platform. This TIE application models content demand and supply upon the counterfactual departure of a creator. The demand model predicts user clicks based on estimated user preferences, while the supply model captures the platform’s content distribution response. Together, they predict how each creator influences user engagement through the platform’s content distribution strategy. We test the predictions of the TIE system with 168 experiments, each examining a different mix of creators and involving more than 9 million unique users. The TIE system and the experiments demonstrate a 97% correlation on the key performance metric (change in user clicks). Based on its low costs, high accuracy, granular output, and minimal latency, Tencent has deployed the TIE system as the default approach to creator valuation, assessing tens of millions of creators each day while avoiding a 2.5% user click loss associated with a typical experiment.
5. Xinyu Cao, Dennis Zhang, and Lei Huang, “The Impact of the COVID-19 Pandemic on the Behavior of Online Gig Workers,” *Manufacturing & Service Operations Management*, 24.5 (2022): 2611-2628. [\[Paper\]](#)
 - Abstract: Using labor supply data from a large online education platform with more than 100,000 gig workers, we investigate how online gig workers changed their behavior after the outbreak of the coronavirus disease 2019 (COVID-19) pandemic and what drove the changes. Online gig workers sharply increased their labor supply on the platform by 23% from the announcement of national emergency to the end of April (stage 1); the increase became smaller in May and June (stage 2) and disappeared in July and August (stage 3). Year-to-year difference-in-difference analyses show that these findings are robust after controlling for seasonality and worker heterogeneity. We show that the increase in gig workers’ labor supply is not driven by higher demand or excessive entry of new workers during the pandemic. A series of mediation analyses indicates that unemployment and

nonpharmaceutical interventions (NPIs) rather than the risk of contracting COVID-19 can better explain why online gig workers increased their labor supply. The impact of unemployment is smaller than that of NPI policies, indicating that the increase in gig workers' labor supply is more driven by temporary changes in working arrangements due to the policies rather than relatively long-term changes in employment situations. We also examine how online gig workers change their quality of work and how their earning potential on the platform relates to their changes in behavior during the pandemic. Our findings provide insights for the management of online gig workers during major disruptions, like the COVID-19 pandemic.

HONORS

- MIT OGE Conference Grant 2026
- Sheth Foundation ISMS Doctoral Dissertation Award 2026
- American Marketing Association TechSIG Doctoral Student Award 2026
- KDD Audience Appreciation Award (February Round) 2025
- MIT Sloan School of Management Fellowship 2020-2026
- Hengda Academic Excellence Scholarship, Tsinghua University 2015-2016
- Academic Excellence Scholarship, Tsinghua University 2014-2015
- Academic Excellence Scholarship, Tsinghua University 2013-2014

TEACHING ASSISTANCE

- Marketing Innovation Spring 2023–2026, Fall 2024–2025
 - Teaching evaluation: 7.0/7.0 (×4), 6.1/7.0 (×1), 6.0/7.0 (×1)

PRESENTATIONS AND CONFERENCES

- The 48th ISMS Marketing Science Conference Jun 2026 (scheduled)
- The 24th Annual International Industrial Organization Conference Apr 2026
- The 6th Artificial Intelligence in Management Conference Mar 2026
- MIT Economics department seminar Nov 2025
- Conference on Artificial Intelligence, Machine Learning, and Business Analytics Dec 2024
- Interactive Marketing Research Conference at Northeastern May 2024
- The 45th ISMS Marketing Science Conference Jun 2023
- The 33rd Annual POMS Conference May 2023
- MIT Marketing group seminar Nov 2022

SERVICE AND PROFESSIONAL MEMBERSHIP

- Ad hoc Reviewer: *Information Systems Research*
- Session Chair: KDD 2025
- Membership: American Marketing Association, INFORMS Society for Marketing Science

COURSEWORK

GPA (19 Ph.D.-level courses): 5.0/5.0

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|---|---|
| • Microeconomic Theory Sequence | G. Ellison, D. Fudenberg, P. Pathak, A. Wolitzky |
| • Econometrics Sequence | V. Chernozhukov, W. Newey |
| • Industrial Organization Sequence | N. Agarwal, G. Ellison, S. Ellison, C. Murry |
| • Inference on Causal and Structural–
Parameters Using ML and AI | V. Chernozhukov |
| • Networks | A. Wolitzky |
| • Algorithms for Inference | G. Wornell |
| • Machine Learning | D. Boning, T. Jaakkola |
| • Natural Language Processing | J. Andreas, Y. Kim |
| • Research Seminar in Marketing | R. Bhui, D. Eckles, J. Hauser, D. Prelec, D. Rand,
C. Tucker, J. Zhang |

LANGUAGE AND TECHNICAL SKILLS

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|-------------|---|
| • Language: | Chinese (native), English (fluent) |
| • Software: | R, Python, Stata, C, Java, SQL, Hadoop, Spark, $\LaTeX$ |

REFERENCES

Juanjuan Zhang (Committee Chair)
John D. C. Little Professor of Marketing
MIT Sloan School of Management
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