Dongcheng Zhang

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Academic Employment

- Post-Doctoral Fellow, Goizueta Business School, Emory University   2022 - Present

Education

- Ph.D. in Management Science and Engineering   Tsinghua University   2022
  Visiting Student   Robert H. Smith School of Business, University of Maryland   2019 - 2020
  Certification of Big Data Analysis   Institute of Data Science, Tsinghua University   2017
- B.E. in Engineering   Tsinghua University   2016
- B.A. in Management   Tsinghua University   2016
- Summer Program in The University of Hong Kong   2014

Research Interests

Topics: Digital Marketing, Online Communities, Platform Strategy, Causal Inference
Methodology: Machine Learning, Deep Learning, Econometrics, Text Mining, Game Theory

Publications

- Dongcheng Zhang, Kunpeng Zhang, Yi Yang and David Schweidel, "TM-OKC: An Unsupervised Topic Model for Text in Online Knowledge Communities." (**Accepted at *Management Information Systems Quarterly***)

Working Papers

- Dongcheng Zhang, Hanchen Jiang, Maoshan Qiang, Kunpeng Zhang and Liangfei Qiu, "Time to Stop? An Empirical Investigation on the Consequences of Canceling Monetary Incentives on a Digital Platform." (**Revising for 3rd round review at *Information Systems Research***)
- Dongcheng Zhang, Kunpeng Zhang and Yuan Liao, "Weighting-Based Treatment Effect Estimation via Distribution Learning." (**Revising for 2nd round review at *Journal of Machine Learning Research***)
- Dongcheng Zhang, Bobby Zhou and Tianxin Zou, "Knowledge Monetization of Online Communities: A Blessing or a Curse?" (**In preparation for submission to *Journal of Marketing Research***)

Selected Work-in-Progress

- Dongcheng Zhang, Kunpeng Zhang and David Schweidel, "Theory-driven Deep Learning-Based Consumer Choice Models."
- Dongcheng Zhang, Kunpeng Zhang and David Schweidel, "Customer Journey Analysis with Interpretable Deep Learning."
- Dongcheng Zhang and Kunpeng Zhang, "Estimating the Distribution of Heterogeneous Treatment Effects via Normalizing Flows."

Conference Talks

- "TM-OKC: An Unsupervised Topic Model for Text in Online Knowledge Communities." *Conference on Information Systems and Technology* (CIST) 2023
- "Customer Lifetime Value Prediction with Interpretable Deep Learning." *INFORMS Marketing Science Conference* 2023
- "Commercialization of Online Communities: A Blessing or a Curse?" *INFORMS Marketing Science Conference* 2021
- "Commercialization of Online Communities: A Blessing or a Curse?" *China Marketing International Conference* 2021

Awards and Honors

- 2018   First-Class Scholarship of Tsinghua University
- 2016   Excellent Student Leader of Tsinghua University
- 2015   Community Service Excellence Award of Tsinghua University
- 2015   National Encouragement Scholarship
- 2014   Academic Excellence Award of Tsinghua University
- 2014   National Encouragement Scholarship
- 2013   Excellent Scholarship of Tsinghua University

Relevant Coursework

- "Machine Learning" by Kunpeng Zhang, University of Maryland
- "Data-driven Marketing Intelligence" by David Schweidel, Emory University
- "Management and Innovation in the Era of Big Data" by Yubo Chen, Tsinghua University
- "Probabilistic Graphical Models" by Zhijian Ou, Tsinghua University
- "Statistical Inference" by Eugene Huang, Emory University
- "Foundations of Big Data Systems" by Mingsheng Long, Tsinghua University
- "Advanced Econometrics" by Meixin Guo, Tsinghua University
- "Analytical Models in Marketing" by Bobby Zhou, University of Maryland
- "Behavioral Modeling in Business" by Haitao (Tony) Cui, Southwest University of Finance and Economics & University of Minnesota

Teaching and Professional Experience

- Co-Instructor (AI in marketing), Emory University, Fall 2023
- Co-Instructor (Generative AI for LLMs), University of Maryland, Fall 2023
- Project Data Scientist (Customer lifetime value modeling based on big data), Macy's, October 2022 - April 2023
- Teaching Assistant (Project management), Tsinghua University, 2021 - 2022

Technical Skills

- Proficient in Python, R, STATA, Mathematica
- Advanced skills in data analysis and statistical modeling, especially in machine learning, deep learning, econometrics, text mining and probabilistic graphical models

Abstracts of Publications and Working Papers

- Dongcheng Zhang, Kunpeng Zhang, Yi Yang and David Schweidel, "TM-OKC: An Unsupervised Topic Model for Text in Online Knowledge Communities." (**Accepted at** *Management Information Systems Quarterly*)

Abstract: Online knowledge communities (OKCs), such as question-and-answer sites, have become increasingly popular venues for knowledge sharing. Accordingly, it is necessary for researchers and practitioners to develop effective and efficient text analysis tools to understand the massive amount of user-generated content (UGC) on OKCs. Unsupervised topic modeling has been widely adopted to extract human-interpretable latent topics embedded in texts. These identified topics can be further used in subsequent analysis and managerial practices. However, existing generic topic models that assume documents are independent are inappropriate for analyzing OKCs where structural relationships exist between questions and answers. Thus, a new method is needed to fill this research gap. In this study we propose a new topic model specifically designed for the text in OKCs, and we make three primary contributions to the research on topic modeling in this context. First, we build a general and flexible Bayesian framework to explicitly model structural and temporal dependencies among texts. Second, we statistically demonstrate the approximate model inference using mean-field and coordinate ascent algorithms. Third, we showcase the practical value and relative merit of our method via a specific downstream task (i.e., user profiling). The proposed model is illustrated using two real-world datasets from well-known OKCs (i.e., Stack Exchange and Quora), and extensive experiments demonstrate its superiority over several cutting-edge benchmarks.

- Dongcheng Zhang, Hanchen Jiang, Maoshan Qiang, Kunpeng Zhang and Liangfei Qiu, "Time to Stop? An Empirical Investigation on the Consequences of Canceling Monetary Incentives on a Digital Platform." (**Revising for 3rd round review at** *Information Systems Research*)

Abstract: Digital platforms commonly use monetary incentives to motivate users to perform specific tasks. Extant studies have shown the effects of introducing such monetary rewards on the outcomes of interest (e.g., participation and performance) on public platforms. However, little is known about the impact of canceling rewards (i.e., whether it simply reverses the effect of their introduction), and less attention is paid to corporate platforms. Our study examines the impact of canceling monetary incentives using quasi-natural experiments on a corporate platform. Similar to prior studies focusing on public platforms, we find that introducing quantity-based monetary incentives increases participation (contribution quantity) but has no significant effect on performance (contribution quality). Yet in contrast, our main empirical analysis reveals that canceling monetary incentives is not simply the reverse process of introducing them. In particular, compared to the increase in participation when monetary rewards were initially introduced, the cancelation of these rewards leads to a sharper decrease in participation. This suggests that canceling rewards has a net negative impact on participation. In addition, canceling monetary rewards also causes a significant decline in performance, which indicates that the performance effects of canceling and introducing rewards are also not simply the opposite of each other. Furthermore, we examine the heterogeneous responses of individuals with different self-motivation types and working competency levels to monetary incentives, highlighting the "asymmetry"

between canceling and introducing incentives. We also discuss the similarities and differences between corporate and public platforms regarding the impact of monetary incentives. Our results provide important practical implications for the design of appropriate platform policies for enterprise information systems and general information systems.

- Dongcheng Zhang, Kunpeng Zhang and Yuan Liao, "Weighting-Based Treatment Effect Estimation via Distribution Learning." (**Revising for 2nd round review at *Journal of Machine Learning Research***)

Abstract: Existing weighting methods for treatment effect estimation are often built upon the idea of propensity scores or covariate balance. They usually impose strong assumptions on treatment assignment or outcome model to obtain unbiased estimation, such as linearity or specific functional forms, which easily leads to the major drawback of model mis-specification. In this paper, we aim to alleviate these issues by developing a distribution learning-based weighting method. We first learn the true underlying distribution of covariates conditioned on treatment assignment, and then leverage the ratio of covariates' density in the treatment group to that of the control group as the weight for estimating treatment effects. Specifically, we propose to approximate the distribution of covariates in both treatment and control groups through invertible transformations via change of variables. To demonstrate the superiority, robustness, and generalizability of our method, we conduct extensive experiments using synthetic and real data. From the experiment results, we find that our method for estimating average treatment effect on treated (ATT) with observational data outperforms several cutting-edge weighting-only benchmarking methods, and it maintains its advantage under a doubly-robust estimation framework that combines weighting with some advanced outcome modeling methods.

- Dongcheng Zhang, Bobby Zhou and Tianxin Zou, "Knowledge Monetization of Online Communities: A Blessing or a Curse?" (**In preparation for submission to *Journal of Marketing Research***)

Abstract: Online communities (OCs) are growing rapidly and are changing users' way of information acquisition in many fields. Although the early community members were usually intrinsically motivated, knowledge monetization in the community, such as the introduction of advertising or other monetization approaches, seems to significantly affect the activities of different members. The central question is whether knowledge monetization would hurt or enhance knowledge dissemination, the latter of which is the original purpose of OCs. In this paper, we build a game-theoretic model to study the impact of knowledge monetization on knowledge generation and dissemination, where we also examine the welfare and profitability implications. Furthermore, we analyze the effects of intrinsic motivation, advertising revenue per user, and quality differentiation on the equilibrium outcomes. After accounting for the platform's ads, the main results still hold qualitatively. In addition, data collected from Zhihu, the largest online community in China, shows empirical evidence consistent with our theoretical results. These results provide new insights and practical implications on the knowledge monetization of OCs.