Jin Miao

CONTACT INFORMATION

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EDUCATION

University of Texas at Dallas, Richardson, TX — **Aug 2020 - May 2026**
Ph.D. Quantitative Marketing

Columbia University, New York City, NY — **Aug 2017 - May 2018**
M.S. Marketing Science

Tsinghua University, Beijing, China — **Aug 2013 - July 2017**
B.A. Economics & B.S. Psychology

Mannheim University, Mannheim, Germany — **Aug 2015 - Dec 2015**
Exchange Student

RESEARCH INTERESTS

Substantive: Generative AI, Behavioral Economics, New Product Development
Methodology: Generative Pre-trained Transformer (GPT), Deep Learning / AI, Game Theory

JOB MARKET PAPER

ProductGPT: A Generative Model of Consumer Decision Dynamics in Limited-Time Product Offerings
Jin Miao, Fanglin Chen, Ying Xie
Presented at INFORMS Marketing Science Annual Conference (2025)
Presented at BizAI Annual Conference (2025)

Abstract: Managers frequently offer limited-time products across various industries, yet few studies examine consumers' dynamic decisions to guide managerial choices about re-issuing previous products or introducing new ones. We develop *ProductGPT*, a novel deep generative pre-trained Transformer designed to predict sequential purchase decisions in limited-time product settings. Three key features differentiate our *ProductGPT* from standard Transformer models. First, it uses triplet input tokens which simultaneously encapsulate decision history, the supply-side sequence of limited-time products, and the demand-side sequence of observed decision outcomes. This approach enables *ProductGPT* to capture meaningful product representations for all products in the assortment. Second, using the encoded long-range and short-range contexts, ProductGPT exclusively predicts consumer decisions. During the inference phase, we can leverage the model to generate consumer decision sequences under alternative limited-time product schemes, thus providing managers a decision tool to help design limited-time products. Third, *ProductGPT* incorporates product features as covariates, enabling managers to forecast sales of new limited-time products through feature-based product embeddings. We apply *ProductGPT* to a unique 20-month transaction dataset of video game loot boxes. Our model consistently outperforms several sophisticated benchmark models in sequential purchase predictions. We demonstrate its ability to forecast aggregate sales, discover behavioral patterns, and support product sequencing strategies.

PUBLICATION

Designing Loot Boxes: Implications for Profits and Welfare
Jin Miao, Sanjay Jain
Marketing Science (2024) vol. 43, no. 6, pp. 1242–1259.

Abstract: A loot box is a probabilistic allocation of virtual products, the exact outcome of which is known to consumers only after purchase. Consumers sometimes purchase these goods multiple times

until their preferred products are obtained. As loot boxes have been gaining enormous popularity in recent years, they are often criticized as exploitative and socially wasteful. In this study, we develop a stylized model to study the optimal design of loot boxes and its impact on profits and social welfare. We find that firms may assign asymmetric probabilities to *ex ante* symmetric products. Firms could use loot boxes to offer products at low prices to users who would not buy these products under the traditional pricing strategy. Loot boxes enable firms to earn higher profits due to better price discrimination and market expansion. Contrary to the widespread criticism of loot boxes as socially harmful, our analysis reveals that the loot box strategy can improve social welfare. Some platforms promise that consumers can obtain their preferred products with no more than a certain number of purchases. Contrary to conventional wisdom, our analysis reveals that such a strategy can increase firm's profits while reducing consumer welfare.

Working Paper

Pricing of Services: An Analysis of the Impact of Availability Bias
Sanjay Jain, Jin Miao

Abstract: Firms often offer subscriptions for services such as extended warranties for automobiles or appliances, and subscription plans for golf or symphony. Before purchasing a subscription, consumers need to estimate the probability of needing the service in the future. Most of the prior research assumes that consumers form an unbiased estimate of their future needs. Empirical evidence, however, shows that consumers often make errors in predicting future needs. We draw on the literature on the availability bias (Tversky and Kahneman 1973) to model how consumers form subjective probabilities of needing the service. We develop a dynamic model in which a firm offers a menu of contracts to consumers, and the menu prices can change over time. We show that availability bias can lead firms to offering subscription plans with below marginal cost pricing for all consumers at the time of service. Contrary to intuition, we find that availability bias can sometimes benefit consumers at the expense of firms. We also find that even perfect competition cannot eliminate the negative impact of availability bias on social welfare, and that consumer and social welfare can be negative even under perfect competition.

Work in Progress

Design Rollover Policy in Subscription Economy
Jin Miao, Haokun Du, Sanjay Jain
Presented at INFORMS Marketing Science Annual Conference (2023)
Presented at Production and Operations Management Conference (2023)

Abstract: Service providers in subscription economy differ markedly in how they treat unused allowances – some offer no rollover, while others permit unlimited carryover. Many subscribers auto-renew their subscription plans without checking unused allowances and evaluating alternative plans. This paper investigates a firm's optimal rollover policy when consumers face uncertain usage and may forget to reevaluate their plans. We develop an infinite-horizon model in which the firm chooses a rollover cap and offers a menu of subscription plans to serve consumers who differ in their self-awareness of memory problems. We show that when consumers are naïve about their memory problems, the firm benefits from allowing rollover but chooses the least generous cap. Contrary to the conventional belief that consumers are better off with more generous rollover policies, we find that when consumers are partially sophisticated, the profit-maximizing firm may offer a more generous policy that ultimately leaves consumers worse off. In contrast, when consumers are fully sophisticated, rollover fails to enhance firm profits. From a policy perspective, mandatory auto-renewal reminders do not alter the rollover policy but improve consumer welfare.

Teaching Interests	Large Language Models in Marketing, AI-Driven Content Creation, Marketing Analytics Digital Marketing, Pricing Analytics and Strategy, New Product Development	
Instructor	Principles of Marketing (BBA-Marketing) *solo instructor* (Class Size: 56, Teaching Evaluation: 5.0/5.0)	Fall 2024
	Principles of Marketing (BBA-Marketing) *solo instructor* (Class Size: 48, Teaching Evaluation: 4.8/5.0)	Fall 2023
Honors Awards Scholarships	ISMS Doctoral Consortium Fellow	Summer 2025
	JSOM Ph.D. Student of the Year, Finalist	Spring 2025
	ISMS Doctoral Dissertation Early-Stage Grant, Finalist	Spring 2025
	Google Cloud Platform Credits Award	Spring 2025
	AMA-Sheth Foundation Doctoral Consortium Fellow	Summer 2023
	Betty and Gifford Johnson Travel Awards	Summer 2023
	Center for Teaching and Learning (CTL) Fellow	Spring 2023
	Academic Excellence Scholarship, Tsinghua University	Fall 2016
	Baden-Württemberg-Stipendium, Mannheim University	Fall 2015
Teaching Assistantship	Principles of Marketing (BBA-Marketing)	Fall 2021, Spring 2022, Spring 2025
	Predictive Analytics for Data Science (MS-Marketing)	Spring 2024, Summer 2025
	Social Media Marketing (BBA-Marketing)	Fall 2021, Spring 2022
	Category Buying (BBA-Marketing)	Spring 2022
	E-Retailing (BBA-Marketing)	Spring 2022
	Marketing Management (MS-Marketing)	Fall 2021
Conference Presentation	INFORMS Marketing Science Annual Conference	Washington DC, June 2025
	BizAI Annual Conference	Richardson TX, March 2025
	INFORMS Marketing Science Annual Conference	Miami FL, June 2023
	Production and Operations Management Conference	Orlando FL, May 2023
Selected Doctoral Coursework	**Marketing / Business**	
	Analytical Models in Marketing	Dmitri Kuksov
	Empirical Models in Marketing	Ying Xie
	Digital Marketing	Ram Rao
	Dynamic Models in Economics and Marketing	Shervin Tehrani
	Behavioral Industrial Organization and Marketing Strategy	Sanjay Jain
	Empirical Industrial Organization in Economics and Marketing	Joonhwi Joo
	Empirical Models in Marketing	Oded Netzer (*Columbia*)
	Mathematical Models in Marketing	Rajeev Kohli (*Columbia*)
	Bridging Behavioral Decision-Making with Marketing Science	Ran Kivetz (*Columbia*)
	Statistics, Optimization, & Machine Learning	
	Advanced Probability and Statistics	Khai Chiong
	Optimization	Milind Dawande
	Bayesian Data Analysis	Qiwei Li
	Causal Inference	Yunan Wu
	Deep Learning	Pankaj Choudhary

Nonparametric Statistics	Sam Efromovich
Numerical Analysis	Saikat Biswas, Yunan Wu
Applied Multivariate Statistics	Kamel Jedidi (*Columbia*)
Machine Learning	Georgios Lentzas (*Columbia*)

Economics

Advanced Managerial Economics	Kyle Hyndman
Game Theory	Gary Bolton
Advanced Game Theory	Dmitri Kuksov
Industrial Organization Theory	Jianqing Chen
Econometrics I, II, III	Donggyu Sul, Dong Li
Advanced Microeconomics	Geoffrey Heal (*Columbia*)

References

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