

Jin Miao

CONTACT INFORMATION

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EDUCATION

University of Texas at Dallas , Richardson, TX Ph.D. Quantitative Marketing	Aug 2020 - May 2026
Columbia University , New York City, NY M.S. Marketing Science	Aug 2017 - May 2018
Tsinghua University , Beijing, China B.A. Economics & B.S. Psychology	Aug 2013 - July 2017
Mannheim University , Mannheim, Germany Exchange Student	Aug 2015 - Dec 2015

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
with Fanglin Chen, Ying Xie

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 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**
with Sanjay Jain
Invited for 2nd round review at Marketing Science

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**
with Haokun Du, Sanjay Jain
Presented at INFORMS Marketing Science Annual Conference (2023)
Presented at Production and Operations Management Conference (2023)

Human and Machine Memory: A Recurrent Memory Transformer Approach

HONORS	ISMS Doctoral Consortium Fellow	Summer 2025
AWARDS	JSOM Ph.D. Student of the Year, Finalist	Spring 2025
SCHOLARSHIPS	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 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) Fall 2024
solo instructor (Class Size: 56, Teaching Evaluation: 5.0/5.0)

	Principles of Marketing (BBA-Marketing) <i>solo instructor</i> (Class Size: 48, Teaching Evaluation: 4.8/5.0)	Fall 2023
TEACHING ASSISTANTSHIP	Principles of Marketing (BBA-Marketing) Predictive Analytics for Data Science (MS-Marketing) Social Media Marketing (BBA-Marketing) Category Buying (BBA-Marketing) E-Retailing (BBA-Marketing) Marketing Management (MS-Marketing)	Fall 2021, Spring 2022, Spring 2025 Spring 2024, Summer 2025 Fall 2021, Spring 2022 Spring 2022 Spring 2022 Fall 2021
CONFERENCE PRESENTATION	INFORMS Marketing Science Annual Conference BizAI Annual Conference INFORMS Marketing Science Annual Conference Production and Operations Management Conference	Washington DC, June 2025 Richardson TX, March 2025 Miami FL, June 2023 Orlando FL, May 2023
SELECTED DOCTORAL COURSEWORK	Marketing / Business Analytical Models in Marketing Empirical Models in Marketing Digital Marketing Dynamic Models in Economics and Marketing Behavioral Industrial Organization and Marketing Strategy Empirical Industrial Organization in Economics and Marketing Empirical Models in Marketing Mathematical Models in Marketing Bridging Behavioral Decision-Making with Marketing Science Statistics, Optimization, & Machine Learning Advanced Probability and Statistics Optimization Bayesian Data Analysis Causal Inference Deep Learning Nonparametric Statistics Numerical Analysis Applied Multivariate Statistics Machine Learning Economics Advanced Managerial Economics Game Theory Advanced Game Theory Industrial Organization Theory Econometrics I, II, III Advanced Microeconomics	Dmitri Kuksov Ying Xie Ram Rao Shervin Tehrani Sanjay Jain Joonhwi Joo Oded Netzer (<i>Columbia</i>) Rajeev Kohli (<i>Columbia</i>) Ran Kivetz (<i>Columbia</i>) Khai Chiong Milind Dawande Qiwei Li Yunan Wu Pankaj Choudhary Sam Efromovich Saikat Biswas, Yunan Wu Kamel Jedidi (<i>Columbia</i>) Georgios Lentzas (<i>Columbia</i>) Kyle Hyndman Gary Bolton Dmitri Kuksov Jianqing Chen Donggyu Sul, Dong Li Geoffrey Heal (<i>Columbia</i>)

REFERENCES

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