Jin Miao

CONTACT INFORMATION

Room 13.206
Naveen Jindal School of Management
Richardson, TX 75080, USA

Mobile: 469-449-2160
E-mail: Jin.Miao@utdallas.edu
Website: jinmiaomkt.github.io

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, Service Marketing

Methodology: Generative Pre-trained Transformer (GPT), Game Theory, Deep Learning

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)

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
JSOM Outstanding Teaching Award	Fall 2024
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
Doctoral Scholarship	Fall 2021 - Spring 2026
University Fellowship for Remote Studies	Fall 2020 - Summer 2021
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) *solo instructor* (Class Size: 48, Teaching Evaluation: 4.8/5.0)	Fall 2023

Teaching Assistantship

Principles of Marketing (BBA-Marketing)	Fall 2021, Spring 2022, Spring 2025
Predictive Analytics for Data Science (MS-Marketing)	Spring 2024
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

References

Sanjay Jain (Co-Chair)
O.P. Jindal Distinguished Chair
Naveen Jindal School of Management
The University of Texas at Dallas
sxj164830@utdallas.edu
+1 (972) 883-5059

Ying Xie (Co-Chair)
Full Professor
Naveen Jindal School of Management
The University of Texas at Dallas
ying.xie@utdallas.edu
+1 (972) 883-5839

Dmitri Kuksov
Ashbel Smith Professor
Naveen Jindal School of Management
The University of Texas at Dallas
dmitri.kuksov0@utdallas.edu
+1 (972) 883-5928

Khai Chiong
Assistant Professor
Naveen Jindal School of Management
The University of Texas at Dallas
khai.chiong@utdallas.edu
+1 (972) 883-5027

Fanglin Chen
Assistant Professor
Miami Herbert Business School
University of Miami
fanglinchen@miami.edu
+1 (305) 284-1772

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