# 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**
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 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**
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)

**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) Fall 2024
*solo instructor* (Class Size: 56, Teaching Evaluation: 5.0/5.0)

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| | Principles of Marketing (BBA-Marketing)<br>*solo instructor* (Class Size: 48, Teaching Evaluation: 4.8/5.0) | Fall 2023 |

## Honors Awards Scholarships

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| 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

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| 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**

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|---|---|
| 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**

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| 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**

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|---|---|
| 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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