Mohsen Foroughifar

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Education

University of Toronto, Toronto, ON, Canada 2017 - present
Ph.D., Quantitative Marketing
Committee: Nitin Mehta, David Soberman, Matthew Osborne, Ryan Webb

University of Tehran, Tehran, Iran 2010 - 2016
M.Sc., Economics, 2016
B.Sc., Electrical Engineering, 2014

Research Interests

Applied Microeconomics, Empirical Industrial Organization, Behavioral Economics

Working Papers

- "The Challenges of Deploying an Algorithmic Pricing Tool: Evidence from Airbnb"
  Job Market Paper
- "The Precision of Word of Mouth, the Consumer's Ability to Recognize Precision, and Its Effect on Markets", *with David Soberman*
  R&R at ***Production and Operations Management***
- "Errors in Learning from Others' Choices"
  Invited for Resubmission to ***Management Science***
- "Paying for Consumer Attention", *with Mengze Shi and Michelle Lu*

Papers in Progress

- "Are Short-Term Home-Sharing Regulations Effective? Evidence from Airbnb", *with Doreen Shen, Unnati Narang, and Hojat Abdolanezhad*
- "Who Should Be Rewarded More? Evaluating The Effect of Reward Allocation", *with Reza Roshangarzadeh and Shervin Tehrani*

Honors & Awards

BEAR/BI-Org Research Grant ($6,500)	2022
TD Management Data and Analytics Lab Research Grant ($7,000)	2021
Shankar-Spiegel Dissertation Proposal Award (runner-up)	2021
AMA-Sheth Foundation Doctoral Consortium Fellow	2021
ISMS Doctoral Consortium Fellow	2020
MIT Professional Education Scholarship	2020
University of Toronto SGS Conference Grant	2019
UTGSU Conference Bursary	2019
Behavioural Economics in Action at Rotman Research Award ($7,500)	2018
University of Toronto Fellowship	2017-2022
Director's Fellowship, Rotman School of University of Toronto	2017-2019
Top Student Prize, University of Tehran	2015
Iranian National Elite Foundation Award	2015

Presentations

2022: TD-MDAL Research Roundtables
2021: Marketing Science Conference (Virtual)
2020: Marketing Science Conference (Virtual), Rotman (Marketing brown bag)
2019: Marketing Science Conference (Rome), BEAR Research Retreat (Toronto)

Other Publications (pre-PhD)

- "Dynamic Regional Effects of Monetary Policy on Employment in Iran (TVP-FAVAR Approach)", with Sajjad Barkhordari [in Persian]
  Quarterly Journal of Applied Theories of Economics, 6(4), 109–136, 2020.

- "Diagnosis of Sleep Apnea Based on Fractal Variability Analysis of EEG Signals in Patients with Obstructive Sleep Apnea", with Peyman Nazari, Tara Ghafari, Sharareh Dariani, and Mohammad R. Raoufy [in Persian]
  Nafas Journal, 1(4), 8–15, 2015.

Conferences

2021: Artificial Intelligence, Machine Learning, and Business Analytics (Temple), FTC Microeconomics Conference (Yale), Quantitative Marketing and Economics (UCLA), Summer Institute in Competitive Strategy (Berkeley), Bass Conference (UT Dallas), Crypto and Blockchain Economics Research (Toronto & Cornell), BI-Org Cash Transfer Programs Symposium (Toronto), ZEW ICT (Manheim), Artificial Intelligence Measurement and Evaluation Workshop (Toronto), NBER Summer Institute (IO, IT & Digitization)

2020: NBER Digitization (Stanford), ZEW Conference on the Economics of ICT (Mannheim), NBER Summer Institute (IO, IT & Digitization, Urban Economics), NBER Economics of AI (Torono), Advances with Field Experiments (Chicago), Quantitative Marketing and Economics (Chicago), FTC Microeconomics Conference (Yale)

2017-2019: NBER Economics of AI Young Scholars Workshop (Toronto), Frontiers in the Economics of Organizations and Markets (Toronto), Econometrics and Applied Micro Conference (Toronto)

Teaching Experience

Teaching Assistant (University of Toronto) 2018 - present

- *Master of Management Analytics program (MMA)*
  Management Analytics Practicum, Analytics in Management, Modelling Tools for Predictive Analytics, Predictive Analytics, Tools for Probabilistic Models and Prescriptive Analytics, Analytics for Marketing Strateg

- *Master of Business Administration program (MBA)*
  Data-Based Management Decisions, Statistics for Management, Managing Customer Value, Marketing Research, Global Marketing, Decision Making with Models & Data, Pricing

- *Master of Management Innovation program (MMI)*
  Prices and Markets

- *Bachelor of Commerce program (BCom)*
  Principles of Marketing, Marketing Research, Marketing and Behavioural Economics, Pricing, Foundations of AI for Management, Machine Learning for Management

Teaching Assistant (University of Tehran) 2012 - 2016

- Statistics I, Statistics II, Game Theory, Microeconomics, Financial Economics

- Calculus I, Calculus II, Probability and Statistics, Differential Equations

Research Experience

Research Assistant to Professors *Tanjim Hossain* and *Peter Landry* 2018-2019
Research Assistant to Professor *Ryan Webb* 2018, 2021

Work Experience

Project Coach 2019 - 2021
Master of Management Analytics Program, University of Toronto
Host Companies: Unilever, York Region, TD Bank, Scotiabank, CIBC, BMO

Data Analyst 2015 - 2016
Marketing Division, PANA Group, Tehran, Iran

IAESTE Summer Intern Jun 2014 - Aug 2014
Hrvatska Elektroprivreda, Osijek, Croatia

Computer Skills

Matlab, Python, R, Stata, C/C++, Eviews
SQL, oTree, Qualtrics, Breadboard, MouseLAB, Tobii Pro

References

Nitin Mehta (Co-Supervisor)
Professor of Marketing
Marketing Area Coordinator
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Abstracts

- **"The Challenges of Deploying an Algorithmic Pricing Tool: Evidence from Airbnb"**
  Job Market Paper

We study the deployment of an algorithmic pricing tool, *Smart Pricing (SP)*, on Airbnb's platform. SP is a machine learning algorithm that uses past data to predict future demand and employs proxies that are correlated with the host's marginal cost to set prices for listings. The success of such deployments depends on how good the performance of the algorithm is and how sellers use it for their business decisions. Our analyses suggest that adopting SP is associated with higher benefits for hosts who rarely change their price compared to those who flexibly adjust their price before adoption. However, hosts who rarely change their prices are surprisingly less likely to adopt the SP. To understand how the platform can overcome this challenge, we propose and estimate a dynamic structural model in which hosts make adoption decisions based on their expectations of the algorithm's behavior. Our estimation results identify a gap between the *actual* performance of the SP algorithm and the host's *prior belief* about it. Specifically, hosts with a pessimistic prior belief about the SP think they will need to manually correct algorithmic prices if they adopt the SP, and this belief is disproportionately stronger for hosts with higher adjustment costs, making the SP adoption less attractive to them. Our counterfactual simulations indicate that the introduction of SP has had a small positive impact on the average host profit and the total platform revenue. But this boost can be significantly raised if Airbnb helps hosts to correct their beliefs about the SP. This highlights the need for proper communication of how the algorithm works and its benefits in order to successfully deploy a machine learning tool. The counterfactual analyses also demonstrate that, since the platform does not fully capture the host's private marginal cost in training the algorithm, using the estimated costs from the structural estimation to re-train the algorithm can significantly increase the profitability of SP for both hosts and the platform. It suggests that combining the results of structural models and machine learning tools can help platforms design better algorithms.

- **"The Precision of Word of Mouth, the Consumer's Ability to Recognize Precision, and Its Effect on Markets"**, with *David Soberman*
  R&R at *Production and Operations Management*

Consumers often use third-party information such as word of mouth, testimonials, and reviews to learn more about the quality of new products. However, it is often difficult for consumers to assess the precision of such information. Moreover, information precision and consumer ability to distinguish high from low precision information change as a category matures. We use a monopoly setting to investigate how the precision of third-party information and consumers' ability to recognize precision affect firm strategy and profit. Conventional wisdom suggests that when a firm is high quality, it should prefer a market where consumers are better at recognizing precise signals. Yet, we show that in the early stages of a product launch, where it is difficult for many consumers to distinguish high from low precision information, a high quality firm is worse off when a higher fraction of consumers recognize precise signals. Surprisingly, this obtains even when the average level of precision is high. Given the ability of consumers to assess precision, as a product category matures, third-parties gain experience so that they generate (on average) more precise information. We show a low quality firm always suffers from higher average information precision. However, a high quality firm can also suffer from more precise information. The precision range in which a high quality firm gains or suffers from better information depends on how skilled consumers are at recognizing signal precision.

- **"Errors in Learning from Others' Choices"**
  Invited for Resubmission to *Management Science*

In decision tasks under uncertainty, individuals usually make errors. These errors can be driven either by incorrect beliefs about the relative objective probability of outcomes ('posterior error'), or by noise in reasoning when beliefs about the relative objective probabilities are correct ('reasoning error'). However, it is often difficult to non-parametrically separate these two errors because of identification challenges. In this paper, I develop a simple experimental setting to non-parametrically identify these errors and study how they extend from an isolated environment to a social setting where subjects learn from others' choices. In a within-subject design, I show that reasoning errors remain unchanged across the isolated and social environments, but posterior errors are significantly amplified in the social condition. This effect is a result of subjects having more uncertainty in the social than in the isolated condition.

- **"Paying for Consumer Attention"**, with *Mengze Shi and Michelle Lu*

Paying-consumers-for-attention through a decentralized system is intended to deal with the consumer (low) attention quagmire of the prevalent digital advertising system. This paper provides an analytical study of such a decentralized system that allows consumers to choose the ad volume they receive and compensates consumers for their attention to the ads using a cryptocurrency (attention token). Our analysis shows that attention compensation, by reducing consumer's *net attention cost*, can motivate high attention to advertisements and improve ad volume efficiency. The equilibrium net attention cost decreases with the advertiser's benefit from matching the products with consumer needs. Thus, paying-consumers-for-attention can better align the interests of consumers and the platform. Our results also demonstrate that in a decentralized system, the net attention cost decreases with the matching between advertisements and consumer needs. However, the opposite is true in a centralized system. Thus, the decentralized system is customer-centric by allowing consumers to reap their attention benefits, while the centralized system is not. Finally, the performance of the decentralized system can be more robust than the centralized system to the imperfectness in monitoring low attention. Overall, our analysis indicates that the emerging decentralized attention compensation systems can be effective in improving the present platform-based digital ad system.