Hong Deng

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ACADEMIC POSITIONS

London Business School — London, United Kingdom
Postdoctoral Research Fellow — 2024-present

EDUCATION

Erasmus University Rotterdam — Rotterdam, Netherlands
PhD candidate in Marketing — 2020-2024
at Department of Business Economics and Department of Econometrics

University of Amsterdam and Tinbergen Institute — Amsterdam, Netherlands
MPhil in Economics (specialization in Econometrics) — 2018-2020

Sun Yat-sen University — Guangzhou, China
BA & MA in Economics — 2012-2018

Queen's University — Kingston, Canada
Academic exchange — Sep-Dec, 2014

RESEARCH INTERESTS

Topics: Personalization, Recommendation Systems, Digital Marketing, Marketing Analytics
Methodologies: Machine Learning, Bayesian Econometrics, Multi-Armed Bandits

RESEARCH WORK

"**Real-Time Personalization in Dynamic Environments**"
with Bas Donkers and Dennis Fok

- ASA Statistics in Marketing Doctoral Dissertation Research Award (finalist, 2024)
- Best Paper Award in the PhD track at Marketing Dynamics Conference (2022)
- Amazon Research Award (Amazon Advertising, 2022)

"**Model-Learning Bandits for Personalization**"
with Bas Donkers and Dennis Fok

"**Optimal Targeting with Time-Varying Reward Functions**"
with Bas Donkers and Dennis Fok

WORK IN PROGRESS

"**Consumer Choice on Digital Platforms: Product Discovery and Consideration Sets When the Platform Offers Private Labels**"
with Anja Lambrecht and Nicolas Padilla

TEACHING EXPERIENCE

- Marketing II - Market Research Methods (Master in Management programme, lecturer), 2025
- Seminar in Machine Learning (Bachelor in Econometrics, co-instructor), 2023
- Seminar in Business Analytics and Quantitative Marketing (Bachelor in Econometrics, co-instructor), 2021-2022
- Thesis Supervision (Bachelor in Econometrics and Master in Data Science and Marketing Analytics), 2020-2023

CONFERENCE PRESENTATIONS

- The Joint Statistical Meetings 2024, Portland, Oregon, USA
- EMAC 2024, Bucharest University of Economic Studies
- Marketing Dynamics Conference 2023, Northeastern University
- AMA-Sheth Foundation Doctoral Consortium 2023, BI Norwegian Business School
- ISMS Marketing Science Conference 2023, University of Miami
- Conference on Artificial Intelligence, Machine Learning, and Business Analytics 2022, Harvard Business School
- Marketing Dynamics Conference 2022, Georgia State University
- ISMS Marketing Science Conference 2022, University of Chicago
- EMAC Doctoral Colloquium 2022, Corvinus University of Budapest
- Goethe University Frankfurt Internal Marketing Seminar Series, Aug 2022 (Visiting PhD)

OTHER RESEARCH ACTIVITIES

- Conference on Data Science, Statistics, and Visualisation and the European Conference on Data Analysis 2021, Erasmus University Rotterdam (local organizing committee member)
- Erasmus School of Economics Female Network (fellow)

HONORS AND AWARDS

ASA Statistics in Marketing Doctoral Dissertation Research Award Finalist	2024
AMA-Sheth Foundation Doctoral Consortium Fellow	2023
ISMS Doctoral Consortium Fellow	2023
EMAC Doctoral Colloquium Fellow	2022
Best Paper Award in the PhD track at Marketing Dynamics Conference	2022
Amazon Research Award (*$20,000 cash and $20,000 AWS computing time*)	2022
Tinbergen Institute Full Scholarship (*€23,760*)	2018-2020

PROFESSIONAL EXPERIENCE

IBM China Shenzhen, China
Intern at Consulting Supply Chain (IBM Blue Pathway Programme) Jun-Aug, 2015

ADDITIONAL INFORMATION

Programming: Python, Julia, R, Stata, Eviews, LaTeX

Languages: Chinese (native), English (fluent), Dutch (pre-intermediate)

Interests: running, stand-up comedy

ABSTRACTS

Real-Time Personalization in Dynamic Environments
with Bas Donkers and Dennis Fok
Real-time personalization engines help find the optimal offer to provide to specific customers. They thereby enable effective customization in E-commerce. Yet, the development of such engines is not trivial. It remains challenging to optimize an offer strategy in real time, especially in a dynamic environment where the set of available offers varies over time. The complexity is further enhanced when trying to utilize situational information next to customer characteristics. We provide an easy-to-implement personalization engine to quickly learn, and serve, optimal context-dependent offers in a situation where the offer set may change over time. We formalize this personalization problem in the multi-armed bandit framework, and propose a new contextual bandit algorithm boosted by the particle filtering estimation technique. Our method allows firms to flexibly introduce new personalized offers, calibrate their impact using prior knowledge from historical data and rapidly update these prior beliefs as new information arrives. With an application to news-article recommendation, we show that, relative to state-of-the-art competing methods, the proposed method improves lift in click-through-rate and is computationally efficient.

Model-Learning Bandits for Personalization
with Bas Donkers and Dennis Fok
Personalization strategies often build on a large set of customer-specific and/or contextual variables to optimally select among many available marketing actions. Contextual multi-armed bandit algorithms can help marketers to adaptively select optimal customized actions. However, conventional contextual bandit algorithms usually consider only a small set of variables, while in real-world problems there are many potentially relevant variables. Exploration is beneficial to identify relevant variables, yet, when faced with a surplus of variables, examining the impacts of all variables can lead to over-exploration and thus inefficiency. To address this challenge, it becomes crucial to leverage an adaptive modeling approach to support the exploration process and to effectively resolve the uncertainty in variable selection. We propose a new approach using variable selection techniques to learn both the optimal model specification and the action-selection strategy. We enhance model interpretability via feature decomposition, to effectively identify both irrelevant and relevant factors. Among relevant factors, we discern between two types: common factors, which have the same influence on consumer behavior for all actions, and hence do not impact the personalized policy, and action-specific factors, whose impact differs across the possible actions and hence do affect the policy. Our method allows firms to run cost-efficient and interpretable bandit algorithms with high-dimensional contextual data.

Optimal Targeting with Time-Varying Reward Functions
with Bas Donkers and Dennis Fok
In a dynamic environment, it is crucial for marketers to continuously monitor the effectiveness of their marketing campaigns. An initially successful campaign may later have adverse effects due to factors such as changes in competitors' strategies or seasonality. This is particularly important in personalized strategies that exploit relations between customer characteristics and the potential outcomes. Shifts in these relations may affect the optimal personalized actions and their profitability. We develop a contextual bandit algorithm with breakpoint detection to accommodate such non-stationary reward patterns. Both simulations and off-policy evaluations on real-world data show the potential of the proposed algorithm compared to existing benchmarks.

Last updated: May, 2025