

Siddharth Prusty

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Education

Ph.D.	Duke University , Durham, NC Marketing (Quantitative)	Expected 2026
M.S.	Columbia University , New York City, NY Industrial Engineering and Operations Research	2020
B.Tech.	Indian Institute of Technology , Kanpur, India Electrical Engineering	2016

Research Interests

Substantive: Policy Design, Retail Media, Advertising Auctions, Sustainability, Regulation.

Methodological: Structural Econometrics, Analytical Modeling, Machine Learning, Operations.

Publications and Working Papers

(Abstracts in Appendix) (*Authors Listed Alphabetically)

Siddharth Prusty, Carl F. Mela, and Hana Choi. “**Enhancing Position Auctions in Retail Media.**” Working Paper (*Job market paper*), 2025.

Wilfred Amaldoss* and Siddharth Prusty*. “**Sustainable Consumption: A Strategic Analysis.**” Forthcoming in *Marketing Science*, 2025.

Fengpei Li, Henry Lam, and Siddharth Prusty. “**Robust Importance Weighting for Covariate Shift.**” *Proceedings of the Twenty Third International Conference on Artificial Intelligence and Statistics*, PMLR 108:352-362, 2020.

Selected Work in Progress

Wilfred Amaldoss* and Siddharth Prusty*. “**Regulating Sustainable Products: A Public Policy Perspective.**”

Conference Presentations

“Enhancing Position Auctions in Retail Media”

- ISMS Marketing Science Conference, University of Georgia (Washington, D.C.), 2025

“Sustainable Consumption: A Strategic Analysis”

- 18th Annual Bass Forms Conference, U.T. Dallas, 2024

- Marketing for Environmental Sustainability Conference, Stanford University, 2023
- ISMS Marketing Science Conference, University of Chicago Booth (Virtual), 2022

Awards, Honors, Service

AMA Sheth Doctoral Consortium (Duke Nominee), Ohio State University, 2025

Ad-Hoc Reviewer, Management Science, 2023

ISMS Doctoral Consortium Fellow (Duke Nominee), U. Chicago Booth (Virtual), 2022

Shardashish Interschool Fellowship, Columbia University, 2018

Honda Young Engineer and Scientist Award, Honda Foundation, 2014

Academic Excellence Award, Indian Institute of Technology, Kanpur, 2013

Teaching

Instructor, Statistical Programming Bootcamp	Duke University
<ul style="list-style-type: none"> • Developed and instructed week-long course on Python (for incoming Ph.D. students in Business Administration) 	2023

Teaching Assistant	Duke University
<ul style="list-style-type: none"> • Value Creation in Martech (MBA, MQM), taught by Carl Mela • Strategy and Tactics of Pricing (MBA, EMBA, MQM), taught by Wilfred Amaldoss • Marketing Management (WEMBA), taught by Preyas Desai • Programming Analytics (MQM), taught by Allison Chaney • Strategic Brand Management (MBA, EMBA), taught by Tong Guo • Marketing Core (MMS), taught by Srinivas Tunuguntla 	2021/23/24 2025 2025 2023 2022-2023 2022

Teaching Assistant	Columbia University
<ul style="list-style-type: none"> • Stochastic Models and Applications, taught by Ton Dieker • Introduction to Financial Engineering, taught by David Yao 	2020 2019-2020

Graduate Coursework

Marketing & Business Administration

PhD level:

Quantitative Marketing Proseminar	Rick Staelin
Special Topics in Quantitative Marketing	Carl F. Mela
Structural Modeling in Marketing (<i>at UNC-CH</i>)	Sriram Venkataraman
Economic Models in Marketing (<i>at UNC-CH</i>)	Rajdeep Grewal
Special Topics in Quantitative Marketing	Allison Chaney, Tong Guo

Economics

PhD level:

Microeconomics I	Philipp Sadowski, Curtis Taylor
Econometrics I	Matt Masten
Industrial Organization	Allan Collard-Wexler, Daniel Xu

Partial Identification: Theory and Applications in IO
Theoretical Industrial Organization (*at UNC-CH*)
Dynamic Discrete Choice
Causal Inference and Treatment Effects

Allan Collard-Wexler, Adam Rosen
Gary Biglaiser
Peter Arcidiacono
Arnaud Maurel

Operations Research

PhD level:

Stochastic Modeling I
Stochastic Modeling II
Optimization I (Continuous Optimization)
Optimization II (Discrete Optimization)
Statistical Models for Simulations

Karl Sigman
Ton Dieker
Vineet Goyal
Yuri Faenza
Henry Lam

Statistics and Machine Learning

Master's level:

Introduction to Machine Learning
Optimization Methods in Machine Learning
Bayesian Models in Machine Learning
Time Series Analysis
Statistical Techniques in Data Mining

Cynthia Rudin
Satyen Kale
John Paisley
Amit Mitra
Amit Mitra

Professional Experience

IBM Research Labs , Research Intern, Armonk, NY	Summer 2020
American Express , Risk Data Analyst, Gurugram, India	2016-2018
iRageCapital Advisory Pvt. Ltd. , Quant Trading Intern, Mumbai, India	Summer 2015
Ecole Normale Supérieure , Software Research Intern, Paris, France	Summer 2014
Avanti Fellows , Course Content Development Intern, Delhi, India	Summer 2013

Computer Languages and Skills

Programming languages: Python, R, Mathematica, Matlab

Tools: LaTeX (Overleaf, Beamer, LyX), Microsoft (Word, PowerPoint, Excel)

References

Carl F. Mela

(Dissertation Chair)

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Appendix: Abstracts

Siddharth Prusty, Carl F. Mela, and Hana Choi. **“Enhancing Position Auctions in Retail Media.”** Working Paper (*Job market paper*), 2025.

Retail media is a fast-growing channel for digital advertising, surpassing \$50 billion of ad spend in 2023. Much of retail media ad spend is monetized by position auctions, wherein advertisers bid for higher placements on retailer's product listing page. Winning such auctions is influenced not only by advertiser bids, but also by a retailer-set quality score. Quality scores are used to favor advertisers who, for example, garner more clicks and purchases, since the retailer seeks to monetize both consumer actions.

Building on the intuition that a retailer can monetize both clicks (through the auction) and purchases (through commissions), this paper proposes simple-to-implement quality score rules that improve a retailer's total profit from clicks and sales in a position auction. Using granular auction-advertiser level data from a retail marketplace, we find evidence that quality score enhancements can improve the marketplace's profits as well as advertiser welfare over the status-quo rules. To predict the long-term profit implications of the proposed quality score rules, we develop a structural model predicting how bids vary with quality scores and use deep learning to predict clicks and purchases. A counterfactual exercise of the proposed quality score rules under endogenous advertiser response is work in progress.

Wilfred Amaldoss and Siddharth Prusty. **“Sustainable Consumption: A Strategic Analysis.”** Forthcoming in *Marketing Science*, 2025.

Consumers' growing concern for the environment has motivated firms to offer sustainable products in several categories. An exploratory survey shows that many consumers desire sustainable products and are willing to pay more for them, but some consumers dislike sustainable products and want to pay less for them. Using a theoretical model where firms are horizontally differentiated and two groups of consumers have divergent preference for sustainable products, we investigate the strategic implications of sustainable consumption. First, our analysis shows that when consumers' dislike for sustainable products is moderate, the price could increase as the dislike increases. Moreover, price could decrease if consumers' desire for sustainable products increases. Second, we find that competing firms' profits can decrease with consumers' desire for sustainability but increase with consumers' dislike for sustainability. Third, we clarify when and why enforcing minimal sustainability standards for products can backfire and reduce consumer surplus. Finally, we extend the model to capture additional facets of sustainable consumption, such as multi-product firms, sustainable luxury goods and political orientation of consumers, and tease out its counterintuitive implications for the firms supplying sustainable products.

Fengpei Li, Henry Lam, and Siddharth Prusty. **“Robust Importance Weighting for Covariate Shift.”** *Proceedings of the Twenty Third International Conference on Artificial Intelligence and Statistics*, PMLR 108:352-362, 2020.

In many learning problems, the training and testing data follow different distributions and a particularly common situation is the covariate shift. To correct for sampling biases, most approaches, including the popular kernel mean matching (KMM), focus on estimating the importance weights between the two distributions. Reweighting-based methods, however, are exposed to high variance when the distributional discrepancy is large, and the weights are poorly estimated. On the other hand, the alternate approach of using nonparametric regression (NR) incurs high bias when the training size is limited. In this paper, we propose and analyze a new estimator that systematically integrates the residuals of NR with KMM reweighting, based on a control-variate perspective. The proposed estimator can be shown to either strictly outperform or match the best-known existing rates for both KMM and NR and thus is a robust combination of both estimators. The experiments show the estimator works well in practice.