Siddharth Prusty

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Education

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

Research Interests

Substantive: Retail Media, Ad Auctions, Mechanism Design, Sustainability, Regulation.

Methodological: Structural Modeling, 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, Ohio State University, 2025 (Duke Nominee)

Ad-Hoc Reviewer, Management Science, 2023

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

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**
- Developed and instructed week-long course on Python (for incoming Ph.D. students in Business Administration)   2023

Teaching Assistant   **Duke University**
- Value Creation in Martech (MBA, MQM), taught by Carl Mela   2021/23/24
- Strategy and Tactics of Pricing (MBA, EMBA, MQM), taught by Wilfred Amaldoss   2025
- Marketing Management (WEMBA), taught by Preyas Desai   2025
- Programming Analytics (MQM), taught by Allison Chaney   2023
- Strategic Brand Management (MBA, EMBA), taught by Tong Guo   2022/23
- Marketing Core (MMS), taught by Srinivas Tunuguntla   2022

Teaching Assistant   **Columbia University**
- Stochastic Models and Applications, taught by Ton Dieker   2020
- Introduction to Financial Engineering, taught by David Yao   2019/20

Graduate Coursework

Marketing & Business Administration
PhD level:

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

Economics
PhD level:

Industrial Organization	Allan Collard-Wexler, Daniel Xu
Partial Identification: Theory and Applications in IO	Allan Collard-Wexler, Adam Rosen
Theoretical Industrial Organization (at UNC-CH)	Gary Biglaiser

Dynamic Discrete Choice	Peter Arcidiacono
Causal Inference and Treatment Effects	Arnaud Maurel
Econometrics I	Matt Masten
Microeconomics I	Philipp Sadowski, Curtis Taylor

Operations Research

PhD level:

Stochastic Modeling I	Karl Sigman
Stochastic Modeling II	Ton Dieker
Optimization I (Continuous Optimization)	Vineet Goyal
Optimization II (Discrete Optimization)	Yuri Faenza
Statistical Models for Simulations	Henry Lam

Statistics and Machine Learning

Master's level:

Introduction to Machine Learning	Cynthia Rudin
Optimization Methods in Machine Learning	Satyen Kale
Bayesian Models in Machine Learning	John Paisley
Time Series Analysis	Amit Mitra
Statistical Techniques in Data Mining	Amit Mitra

Professional Experience

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

Computer Languages and Skills

Programming languages: Python, R, Mathematica, Stata, Matlab

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

References

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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, a fast-growing channel for digital advertising, surpassed $55 billion of ad spend in 2024. A common retail media format involves position auctions, in which advertisers bid for higher placements on a retailer's product listing page. Advertiser bids are combined with a retailer-set quality score to determine the allocation of sponsored slots and the resulting payments. Quality scores boost certain advertisers' positions and reduce their per-click price. Unlike search engine advertising, retail media position auctions can monetize sales commissions as well as clicks. This paper develops a quality score approach to effectively balance these monetization options.

To connect quality scores to retail revenues, the paper develops a structural model linking advertiser bids and revenues to the retailer's quality score choices coupled with a machine learning model of consumer behavior. These models are estimated using auction-advertiser level data from a quality score experiment conducted at a mid-size US based retail marketplace. Policy simulations show that a quality score approach that balances clicks and commissions improves retailer profits by 7% and advertiser surplus by 42% over click-based approaches typically used by retailers, leading to a win-win outcome for both.

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.

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

At the core of sustainable consumption lies a public goods dilemma: while some consumers invest significant financial and personal resources in adopting sustainable practices, and some firms incur costs to develop eco-friendly products and services, a considerable proportion of both consumers and firms engage in free riding, reaping the environmental benefits of sustainability without contributing to its provision (Milinski et al., 2006). Moreover, sustainable consumer behavior frequently exhibits present bias, wherein short-term consumption benefits are weighted more heavily than the long-term environmental and social consequences of those choices (Trudel, 2019). Using a theoretical model that incorporates consumption externalities and behavioral biases in sustainable consumption, this paper investigates the strategic implications of regulatory instruments targeted towards consumers (e.g., price discounts) or firms (e.g., sustainability mandates). The theoretical analysis examines how policymakers can design regulatory instruments to incentivize firms and consumers to foster a sustainable future.

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 machine 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. Experiments show the estimator works well in practice.