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Hana Choi

Ph.D. Candidate, Quantitative Marketing
Duke University

CONTACT

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EDUCATION

PhD	**Duke University**, Quantitative Marketing	2013 - 2019 (expected)
MA	**University of Pennsylvania**, Economics	2012
BS	**Yonsei University**, Dual Business Administration and Economics	2007

RESEARCH INTERESTS

Digital Economy, Advertising, Consumer Search, Two-Sided Markets, Startup Business, Applied IO

WORKING PAPERS

- **Display Advertising Pricing in Exchange Markets**
  with Carl F. Mela
  Job Market Paper
- **Monetizing Online Marketplaces**
  with Carl Mela
  Revising for 2nd round at *Marketing Science* (at final proof-reading stage for submission)
  Previously titled “Online Marketplace Advertising”
- **Online Display Advertising Markets: A Literature Review and Future Directions**
  with Carl F. Mela, Santiago Balseiro, Adam Leary
  Revising for 2nd round at *Information Systems Research*

WORK IN PROGRESS

- **Display Advertising Pricing, Allocation, and Information Sharing in Dual Channel**
  with Carl F. Mela
  Data collected, analysis in progress
- **Long-Term Effect of SMS Retargeting: Balancing Opt-Out and Short-Term Direct Responses**
  Data collected, analysis in progress

INDUSTRY EXPERIENCE

- **CBS Interactive, Data Science Team**, San Francisco, CA
  Academic Research Fellow — June 2015 - Present
- **The-Nuvo**, Seoul, Korea
  CMO — Feb 2013 – Aug 2013
  Data Analyst (Part Time) — Nov 2011 – Jan 2013
- **Ernst & Young, Transfer Pricing Division**, Manhattan, NY
  Intern — Summer 2012

HONORS AND AWARDS

Dissertation Research Travel Award, Duke University, $2000	2017
MSI Research Grant, co-PI with Carl Mela, Santiago Balseiro, Adam Leary, $5000	2016
Graduate Fellowship, Duke University	2013
Korea Foundation for Advanced Studies (KFAS) Fellowship	2007
BK 21 Research Scholarship	2007
DK Korea Fellowship	2006
Higher Civil Service National Examination Scholarship	2005
Yonsei University Scholarships	2003

PRESENTATIONS

- **Monetizing Online Marketplaces**
  NBER Summer Institute IT and Digitization, Boston — 2017
  Marketing Science Conference, Johns Hopkins — 2015
- **Display Advertising Pricing in Exchange Markets**
  Duke-UNC Brownbag — 2017
  CBS Interactive, San Francisco — 2015, 2016

CONFERENCE PARTICIPATION

Marketing Science Conference, Temple	2018
ISMS Doctoral Consortium, Temple	2018
NBER Summer Institute, Boston	2017
Quantitative Marketing and Economics, Northwestern	2016
Quantitative Marketing and Economics, MIT	2015
Marketing Science Conference, Johns Hopkins	2015
Marketing Science Conference, Emory	2014
ISMS Doctoral Consortium, Emory	2014
Workshop on Quantitative Marketing and Structural Econometrics, Duke	2013

TEACHING EXPERIENCE

- **Duke University, Teaching Assistant**
  Strategy and Tactics of Pricing (MBA), taught by Wilfred Amaldoss 2017
  Marketing Core (MBA), taught by Carl Mela and Bryan Bollinger 2015, 2016
  Product Management (MBA), taught by Carl Mela 2014
- **University of Pennsylvania, Teaching Assistant**
  Microeconomic Foundations (MBA) 2012
  Advanced Topics in Managerial Economics (MBA) 2012
  Business Economics and Public Policy (undergraduate course) 2012
  Managerial Economics (undergraduate course) 2010, 2011
- **University of Pennsylvania, Instructor**
  Intermediate Microeconomics (undergraduate, summer course) 2010
- **Yonsei University, Teaching Assistant**
  Intermediate Microeconomics (undergraduate course) 2007

CONTACTS FOR LETTERS

Carl F. Mela (Chair)
T. Austin Finch Foundation Professor of Marketing
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Bryan Bollinger
Assistant Professor of Marketing
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Santiago R. Balseiro
Assistant Professor of Decision, Risk, and Operations
Columbia University
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Hema Yoganarasimhan
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SELECTED RESEARCH ABSTRACTS

- **Display Advertising Pricing in Exchange Markets**
  With Carl F. Mela

Abstract: This paper considers how a publisher (e.g., Wall Street Journal) should set reserve prices for real-time bidding (RTB) auctions when selling display advertising impressions through ad exchanges, a $40 billion market and growing. Through a series of field experiments, we find that setting the reserve price increases publisher's revenues by 32%, thereby affirming the importance of reserve price in maximizing publisher's revenues from auctions. Further, we find that advertisers increase their bids in response to an experimental increase in reserve price, and show this behavior is consistent with the use of a minimum impression constraint to ensure advertising reach.

Based on this insight, we construct an advertiser bidding model and use it to infer the overall demand curve for advertising as a function of reserve prices. Using this demand model, we solve the publisher pricing problem. Incorporating the minimum impression constraint into the reserve price

setting process yields a 50% increase over a solution that does not incorporate the constraint, and an additional increase in profits of nine percentage points.

- **Monetizing Online Marketplaces**
  with Carl F. Mela

Abstract: This paper considers the monetization of online marketplaces. These platforms trade-off fees from advertising with commissions from product sales. While featuring advertised products can make search less efficient (lowering transaction commissions), it incentivizes sellers to compete for better placements via advertising (increasing advertising fees). We consider this trade-off by modeling both sides of the platform. On the demand side, we develop a joint model of browsing (impressions), clicking, and purchase. On the supply side, we consider sellers' valuation and advertising competition under various fee structures (CPM, CPC, CPA) and ranking algorithms.

Using buyer, seller, and platform data from an online marketplace where advertising dollars affect the order of seller items listed, we find that ranking items by consumer utility lowers platform's profits as it leads to more lower price item purchases. Combining a ranking algorithm that sorts items by expected sales revenue with a CPC auction limited to the top 5 positions improves profits the most, because this practice monetizes the highest valuations for advertising on top, while enhancing the transaction revenues in the lower positions.

- **Online Display Advertising Markets: A Literature Review and Future Directions**
  with Carl F. Mela, Santiago Balseiro, Adam Leary

Abstract: This paper summarizes the display advertising literature, organizing the content by the agents in the display advertising ecosystem, and proposes new research directions. In doing so, we take an interdisciplinary view, drawing connections among diverse streams of theoretical and empirical research in marketing, economics, operations, and computer science. By providing an integrated view of the display advertising ecosystem, we hope to bring attention to the outstanding research opportunities in this economically consequential and rapidly growing market.