Madhav Kumar

madhavk@mit.edu
madhavkumar.com
+1 617 971 6954

Massachusetts Institute of Technology,
E62-367, Sloan School of Management,
Cambridge, MA 02142

Academic Appointments

MIT Sloan School of Management — Cambridge
Post-Doctoral Associate, Initiative on the Digital Economy — *Jun 2022 –*

Education

Massachusetts Institute of Technology — Cambridge
Ph.D. Quantitative Marketing — *2022*
MSI Alden G. Clayton Dissertation Proposal Competition, 2021
MIT Sloan Doctoral Forum Best Dissertation Award, 2022
Focus: recommendation systems, bundling, algorithmic pricing, causal inference, experiment design, machine learning

Indira Gandhi Institute of Development Research — Mumbai
M.Sc. Economics — *2011*

Hindu College, University of Delhi — New Delhi
B.Sc. (Honors) Physics — *2008*

Publications

Identity Effects in Social Media, with S. Taylor, L. Muchnik, and S. Aral
Nature Human Behavior, 2022

How Do Successful Scholars Get their Best Research Ideas? An Exploration
Marketing Letters, 2019
with C. Cao, X. Cao, M. Cashman, A. Timoshenko, J. Yang, S. Yu, J. Zhang, Y. Zhu, and B. Wernerfelt

Under Review

Generative AI and Personalized Video Advertisements, with A. Kapoor
Major Revision, Marketing Science, 2023

The Virtualization Hypothesis: Explaining Sustained Blockchain Decentralization with Quasi Experiments, with H. Ju, E. Valavi, and S. Aral
Under Review, 2023

Are Blockchain Ecosystems Centralizing or Decentralizing? A Framework for Longitudinal Analysis, with H. Ju, E. Valavi, and S. Aral
Under Review, 2023

Scalable Bundling via Dense Product Embeddings, with D. Eckles and S. Aral
Major Revision, Management Science, 2022
Best paper nomination, WISE 2019
2022 ASA Statistics in Marketing Doctoral Research Award Finalist

Algorithmic Pricing and Consumer Sensitivity to Price Volatility, with D. Aparicio and D. Eckles
Under review, 2023
Best paper nomination, CIST 2021

Working Papers

Inclusive Recommendations and User Engagement: Experimental Evidence from Pinterest, with P. Silva, A. Singh, and A. Varmaraja
Working Paper, 2023

Challenges in Online Experimentation, with I. Bojinov, D. Holtz, R. Johari, N. Kallus, and multiple industry co-authors
Technical Report, 2023

Work in Progress

Pre-launch Demand Estimation and Optimal Product Diversity, with M. Ibragimov and A. Kapoor
Algorithmic Auditing through Targeted Experimentation, with A. Fradkin
Display Model Diversity and Product Success in Online Fashion, with A. Kapoor and P. Chintagunta
Narrative Arcs and Engaging Content in Video Advertisements, with J. Hauser and N. Wang
Efficient Treatment Effects Estimation for Long-Term Outcomes, with D. Eckles

---

Teaching & Advising

Analytics Lab, Prof. Sinan Aral — MBA, MBAn, Exec. MBA
TA (Evaluation: 6.5/7) — *Fall 2020, Summer 2020, Summer 2019*
MBAn: Masters in Business Analytics

Marketing Analytics, Prof. Dean Eckles — MBA, MBAn
TA (Evaluation: 6.5/7) — *Spring 2021, Spring 2020, Spring 2019*

Global Startup and Teaching Labs — Exec., Masters, High School
Course Developer and Instructor — *Winter 2019 (Uruguay), Summer 2017 (Germany), Winter 2016 (Israel)*
Designed and taught a hands-on deep learning course to promote AI-based entrepreneurship.
Led a technology incubator for company executives, graduate researchers, and high-school students.

MicroMasters Program in Statistics and Data Science — Masters
Masters thesis co-advisor - 3 students — *Spring 2021 (Uruguay)*

Analytics Lab Project Mentor — MBA, MBAn, Exec. MBA
Mentored group of 3-4 students for company sponsored projects — *Fall 2017, Fall 2018, Fall 2019*

Undergraduate Research Mentor — UG
Supervised data collection and annotation, and survey design — *Spring 2021, Fall 2020*

Corporate Training — Analysts, Mid-level Managers
Course Developer and Instructor — *2016, 2017, 2018*
Data Science and Machine Learning training for one of the largest insurance providers in the US.

Conferences & Seminars

Inclusive Recommendations and User Engagement: Experimental Evidence from Pinterest

- **2023**: MIT Marketing Seminar, Oct 2023; WISE, Hyderabad, Dec 2023

Generative AI and Personalized Video Advertisements

- **2023**: Social Analytics Lab, MIT, Sep 2023; 13^{th} China India Insights Conference, Stanford University, Sep 2023

Algorithmic Pricing and Consumer Sensitivity to Price Volatility

- **2023**: Munich Summer Institute, May 2023; SCECR, Bogota, Jun 2023
- **2022**: Delhi School of Economics Winter School, Dec 2022
- **2021**: CIST, LA, Oct 2021 (*Best paper nomination*); University of Chicago, Sep 2021; Boston College, Sep 2021; National University Singapore, Aug 2021; ZEW ICT Conference, Jun 2021; ISMS Marketing Science Conference, Jun 2021; Theory + Practice in Marketing, Jun 2021
- **2020:** Marketing Research Seminar, MIT, May 2021; Social Analytics Lab, MIT, Apr 2021; CODE, MIT, Nov 2020

Scalable Bundling via Dense Product Embeddings

- **2023**: Theory + Practice in Marketing, Jun 2023
- **2022**: JSM, Aug 2022, *ASA Statistics in Marketing Doctoral Research Award Finalist*; Cornell University, Mar 2022
- **2021:** Emory University, Dec 2021; Wharton School, University of Pennsylvania, Dec 2021; University of Cambridge, Nov 2021; University College London, Nov 2021; Northeastern University, Oct 2021; University of Chile, Oct 2021; New York University, Oct 2021; Imperial College London, Oct 2021; WISE, Munich, Dec 2019, *Best paper nomination*
- **2020:** Guest Lecture, Analytics Lab, MIT, Nov 2020; Guest Lecture, Marketing Analytics, MIT, Mar 2020
- **2019:** Social Analytics Lab, MIT, Nov 2019; AFE, University of Chicago, Sep 2019; ZEW ICT Conference, Mannheim, Jun 2019; Marketing Science, Jun 2019; Transatlantic Doctoral Conference, LBS, May 2019; Guest Lecture, Marketing Analytics, MIT, Mar 2019
- **2018:** CODE, MIT, Oct 2018

Honors

INFORMS Marketing Science Doctoral Consortium Fellow — *Jun 2021*

AMA-Sheth Foundation Doctoral Consortium Fellow — *Jun 2020*

Best paper nomination, WISE — *Dec 2019*

INFORMS Marketing Science Doctoral Consortium Fellow — *Jun 2019*

NBER Digital Tutorial Fellow, Stanford — *Mar 2019*

NBER Economics of AI, Fellow, Toronto — *Sep 2018*

MIT Graduate Fellowship — *2016 - 2022*

Work Experience

Pinterest — Remote
Research Consultant — *Jun 2022 –*

Microsoft Research — Remote
Ph.D. Summer Research Intern — *May 2021 – Aug 2021*

Stitch Fix, Algorithms Team — Remote
Research Consultant — *Nov 2020 – Dec 2021*

Stitch Fix, Algorithms Team — Remote
Ph.D. Summer Research Intern — *Jun 2020 – Aug 2020*

Centre for Advanced Financial Research and Learning (CAFRAL), Reserve Bank of India — Mumbai
Research Associate — *Sep 2014 – Jun 2016*

Fractal Analytics — New York/Mumbai
Data Scientist — *Jun 2011 – Mar 2014*

Pre-Ph.D. Research

Customer Churn Dynamics: Identifying Drivers of Customer Churn to Predict Subscription Renewals, with H. Hariharan, T. Chakravarty, and G. Dixit
Wharton Customer Analytics Initiative

Rapid Spatial Aggregation, with M. Loecher
Communications in Computer and Information Science, Volume 499, Springer, 2015

Predicting Usefulness of Online Reviews, with S. Upadhyay
Proceedings of the 11^{th} Australasian Data Mining Conference, CRPIT, 2013

Crime Analyses using R, with A. Sengupta and S. Upadhyay
Data Mining Applications with R, Elsevier, 2013

Ensemble of Machine Learners to Predict US Census Mail Return Rates, with S. Godbole and S. Upadhyay
3^{rd} IIMA International Conference on Advanced Data Analysis, Business Analytics and Intelligence, 2013

Software

RapidPolygonLookup, with M. Loecher — R package
Efficient nearest neighbors search for fast allocation of geo-tagged points to spatial polygons — *2014*

Social Good

Selected as one of the 1000 global leaders by UNLEASH to develop high-impact solutions for the UN Sustainable Development Goals — *Aug 2017*

Analyzed 30 years of human rights violation data and identified severe cases using machine learning for Amnesty International — *Nov 2013*

Examined the difference between living wage and minimum wage for food industry employees; with New York Communities for Change — *Sep 2013*

Promoted non-formal education among school dropouts in rural areas of Jammu region with Shantineketan Bal Bhawan — *Aug – Dec 2008*

Data Mining Competitions

Liberty Mutual – Fire Peril Loss Cost, rank: 9/634 *2014*

See Click Predict Fix, rank: 5/532 *2013*

See Click Predict Fix – Hackathon, rank: 2/80 *2013*

Yelp Challenge, rank: 3/350 *2013*

U.S. Census Return Rate Challenge, rank: 7/243 *2012*

Skills & Interests

Areas: Machine Learning, Causal Inference, Econometrics, NLP, Computer Vision, Computational Social Science

Tools: R, Python, Tensorflow, PyTorch, SAS, STATA, SQL, Git, LaTeX

Languages: Hindi (native), English (fluent), Marathi (conversational), Deutsch (beginner),

Personal: Blogging on R & ML, Recreational data mining, Playing the violin, Hiking, Aimless wanderings

---

References

Sinan Aral
David Austin Professor of Management
Professor, Information Technology and Marketing
MIT Sloan School of Management
sinan@mit.edu

Dean Eckles
Mitsubishi Career Development Professor
Associate Professor, Marketing
MIT Sloan School of Management
eckles@mit.edu

John Hauser
Kirin Professor of Marketing
Professor, Marketing
MIT Sloan School of Management
hauser@mit.edu