

# CONFERENCE ON DIGITAL EXPERIMENTATION

@CODEConference  
#CODECON19

Hosted by the MIT Initiative on the Digital Economy

## Friday, November 1

8:00am Registration, Breakfast, Opening Remarks (7th Floor)

9:00am Plenary Session 1 (7th Floor)

Session Chair: Dean Eckles (MIT)

**Multiple Randomization Designs for Interference.** Guido Imbens (Stanford University)

**Top Challenges from the first Practical Online Controlled Experiments Summit.** Ronny Kohavi (Previously at Microsoft)

10:10am Coffee Break (6th Floor)

10:30am Parallel Sessions (6th Floor)

### A: Experiments with Spillovers (DR 3+4)

Session Chair: Guido Imbens

**Minimax Crossover Designs for Digital Experimentation.** Guillaume Basse (Stanford), Yi Ding (University of Chicago) and Panos Toulis (Chicago Booth School of Business).

**Randomized Graph Cluster Randomization.** Johan Ugander (Stanford), Hao Yin (Stanford).

**Variance Reduction in Bipartite Experiments through Clustering.** Jean Pouget-Abadie (Google Research), Kevin Aydin (Google Research), Warren Schudy (Google Research), Kay Brodersen (Google), Vahab Mirrokni (Google).

**Efficient Design and Estimation for Time-split Experiments.** MJ Lee (Lyft), Sean J. Taylor (Lyft), Cameron Bruggeman (Lyft), Keshav Puranmalka (Lyft).

### B: Incentives, Bias, and Algorithms (DR 5)

Session Chair: Ronny Kohavi

**Biased Programmers? Or Biased Data? A Field Experiment about Algorithmic Bias.** Bo Cowgill (Columbia Business School), Fabrizio Dell'Acqua (Columbia Business School).

**Manipulation Proof Machine Learning.** Daniel Björkegren (Brown), Joshua Blumenstock (UC Berkeley).

**Media and motivation: The effect of performance pay on writers and content.** Jared Gars (OECD) Emilia Tjernstrom (UW Madison) Ivan Balbuzanov (U Melbourne)

**Management by AI-Bot: A Field Experiment of Algorithm Coaching on Employee Performance.** Nan Jia (USC); Zheng Fang (Sichuan University); Xueming Luo (Temple University).

11:45am Lunch (7th Floor)

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## Friday, November 1

12:45pm **Plenary Session 2 (7th Floor)**

Session Chair: Erik Brynjolfsson (MIT)

**The Long-term and Spillover Effects of Price Promotions on Retailing Platforms: Evidence from a Large Randomized Experiment on Alibaba.** Hengchen Dai (UCLA)  
**Algorithmic Bias?: Is there a role for digital experimentation?** Catherine Tucker (MIT)

2:00pm **Coffee Break (6th Floor)**

2:30pm **Parallel Sessions (6th Floor)**

### C: Advertising and Data (DR 3+4)

Session Chair: Hengchen Dai

### D: Markets & Platforms (DR 5)

Session Chair: Ronny Kohavi

**Consumer Consent and Firm Targeting after GDPR: The Case of a Large Telecom Provider.** Miguel Godinho de Matos (Catolica Lisbon School of Business and Economics), Idris Adjerid (Virginia Tech).

**Agency and Homophily: Evidence from a Two-Sided Audit.** Bo Cowgill (Columbia Business School), Patryk Perkowski (Columbia Business School), Dan Wang (Columbia Business School).

**Search Advertising and Information Discovery: Are Consumers Averse to Sponsored Messages?** Navdeep Sahni (Stanford), Charles Zhang (Stanford).

**Job Search Behavior with Signals of Congestion.** Monica Bhole (Facebook), Andrey Fradkin (Boston U.), John Horton (MIT).

**The Value of Personal Data in Internet Commerce: A High-stake Field Experiment on Data Regulation Policy.** Tianshu Sun (USC), Zhe Yuan (Alibaba), Chunxiao Li (Alibaba), Kaifu Zhang (Alibaba).

**The Secret to Finding Love: A Field Experiment of Choice Structure in Online Dating Platform.** Jaehwuen Jung (Temple), Hyungsoo Lim (HKUST), Dongwon Lee (HKUST), Chul Kim (CUNY).

**Display Advertising Pricing in Exchange Markets.** Hana Choi (University of Rochester), Carl F. Mela (Duke University).

**Your Preference or Mine? A Randomized Field Experiment on Recommender Systems in Two-sided Matching Markets.** Lanfei Shi (UVA), Siva Viswanathan (UMD), Kunpeng Zhang (UMD).

3:45pm **Coffee Break (6th Floor)**

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Friday, November 1

4:15pm Parallel Sessions (6th Floor)

**E: Methods (DR 3+4)**

Session Chair: Michael Zhao (MIT)

**SoftBlock: Efficient and Optimal Treatment Assignment for Experiments.** David Arbour (Adobe Research), Drew Dimmery (Facebook), Anup Rao (Adobe Research).

**Machine Learning for Compliance-Weighted Wald Estimators.** Dominic Coey (Facebook), Nihar Shah (Facebook).

**Variance-weighted estimators to improve sensitivity in online experiments.** Kevin Liou (Facebook), Sean J. Taylor (Lyft).

**Calibration of Heterogeneous Treatment Effect Models.** Yan Leng (MIT), Drew Dimmery (Facebook).

**F: Networks & Information (DR 5)**

Session Chair: Yuan Yuan (MIT)

**Information gerrymandering and undemocratic decisions.** Alexander J. Stewart (University of Houston), Mohsen Mosleh (MIT), Marina Diakonova (Oxford), Antonio A. Arechar (MIT), David G. Rand (MIT), Joshua B. Plotkin (University of Pennsylvania).

**The Power of Open Networks: Evidence from LinkedIn Experiments.** Karthik Rajkumar (Stanford University), Guillaume Saint-Jacques (LinkedIn), Iavor Bojinov (Harvard Business School).

**How Emotions Impact Online Content Spread: Evidence from a Massive Online Social Network.** Yifan Yu (UW), Shan Huang (UW), Yuchen Liu (UW), Yong Tan (UW).

**Rumors on Social Networks.** Kristen M. Altenburger (Stanford).

5:30pm Fireside Panel (7th Floor)

7:00pm Reception (7th Floor)



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## Saturday, November 2

8:30am Registration, Breakfast, Opening Remarks (7th Floor)

9:30am Plenary Session 3 (7th Floor)

Session Chair: Dean Eckles (MIT)

**Almost Matching Exactly.** Cynthia Rudin (Duke University)

**Surrogate Metrics for Evaluating Experiments.** Susan Athey (Stanford)

10:30am Coffee Break (6th Floor)

10:45am Parallel Sessions (6th Floor)

### G: Education, Labor & Innovation (DR 3+4)

Session Chair: Cynthia Rudin

**The Limits of Scalable Interventions: Evidence from 248 Online Courses.** Rene Kizilcec (Cornell), Justin Reich (MIT), Michael Yeomans (Harvard), Emma Brunskill (Stanford), Christoph Dann (CMU), Glenn Lopez (Harvard), Dustin Tingley (Harvard).

**What Motivates Innovative Entrepreneurs? Evidence from a Field Experiment.** Jorge Guzman (Columbia University), Jean Oh (Columbia University), Ananya Sen (Carnegie-Mellon University).

**Economic Cost of Monitoring.** Chen Liang (University of Connecticut), Jing peng (University of Connecticut), Yili Hong (Arizona State University), Bin Gu (Arizona State University).

**Workplace Attributes and Women's Labor Supply Decisions: Evidence from a Randomized Experiment.** Nivedhitha Subramanian (Duke University).

**Broadening Participation with Diversity Statements: Evidence from a Longitudinal Matched Pairs Design.** Rene Kizilcec (Cornell University), Andrew Saltarelli (Stanford University).

### H: Accelerating Experimentation (DR 5)

Session Chair: Susan Athey

**Test & Roll: Profit-Maximizing A/B Tests.** Elea McDonnell Feit (Drexel) & Ron Berman (Wharton).

**The Upworthy Research Archive: A Time Series of 32,488 Experiments in U.S. Advocacy.** J. Nathan Matias (Cornell), Kevin Munger (Penn State).

**Post-Selection Inference in A/B Tests.** Alex Deng (Microsoft), Jiannan Lu (Microsoft) Yicheng Li (Microsoft).

**Active Staggered Experimental Design.** Susan Athey (Stanford), Mohsen Bayati (Stanford), Guido Imbens (Stanford), Ruoxuan Xiong (Stanford).

**Adaptive Experimentation and Off-Policy Evaluation.** Vitor Hadad (Stanford GSB), David A. Hirshberg (Stanford GSB), Ruohan Zhan (Stanford ICME), Stefan Wager (Stanford GSB), Susan Athey (Stanford GSB).

12:00pm Lunch and Poster Slam (7th Floor)



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Saturday, November 2

Tianshu Sun

1:30pm Parallel Sessions (6th Floor)

### I: Experimentation Tools & Methods (DR 3+4)

Session Chair: Seth Benzell (MIT)

**Mangrove: automated metrics calculation in a dynamic heterogeneous environment.** Craig Boucher (Microsoft), Ulf Knoblich (Microsoft), Daniel Miller (Microsoft), Sasha Patotski (Microsoft), Amin Saied (Microsoft), Venky Venkateshaiah (Microsoft).

**Efficient Computation of Linear Model Treatment Effects in an Experimentation Platform.** Jeffrey Wong (Netflix), Randall Lewis (Netflix), Matthew Wardrop (Netflix).

**Preference Learning for Multi-Objective Decision Making in Online Experiments.** Zhiyuan "Jerry" Lin (Stanford), Adam Obeng (Facebook), Eytan Bakshy (Facebook).

**Interpreting Experiments with Multiple Outcomes.** Tom Cunningham (Facebook), Josh Kim (Stanford).

**Not All Mobile Devices Are Equal: Measuring Heterogeneous Performance in Online Controlled Experiments.** Evan Chow (Snap, Inc.), Yuxiang Xie (Snap, Inc.), Xiaolin Shi (Snap, Inc.).

### J: Marketing & Competition (DR 5)

Session Chair: Dean Eckles

**The Value of Competitor Information: Evidence from a Field Experiment.** Hyunjin Kim (Harvard).

**The Effect of Voice AI on Consumer Purchase and Search Behavior.** Chenshuo Sun (NYU), Zijun Shi (HKUST), Xiao Liu (NYU), Anindya Ghose (NYU), Xueying Li (Alibaba), Feiyu Xiong (Alibaba).

**Optimizing Targeting Policies via Adaptive Experimentation: An Application to User Retention at the Boston Globe.** Jeremy Yang (MIT), Dean Eckles (MIT), Paramveer Dhillon (Michigan), Sinan Aral (MIT).

**Still Targeting Younger Customers? A Field Experiment on Digital Communication Channel Migration.** Zherui Yang (Erasmus University), Aaron Cheng (London School of Economics), Ting Li (Erasmus University).

**Dynamic Mobile App Targeting: A Combination of Deep Reinforcement Learning and Digital Field Experimentation.** Wen Wang (Carnegie Mellon University), Beibei Li (Carnegie Mellon University), Xueming Luo (Temple University).

2:45pm Coffee Break (6th Floor)



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## Saturday, November 2

3:15pm Parallel Sessions (6th Floor)

### K: Externalities and AI (DR 3+4)

Session Chair: Eytan Bakshy

### L: Behavioral Interventions (DR 5)

Session Chair: Michelle Meyer

**How Does Paid Advertising Impact Organic App Installs.** Michael Zhao (MIT), Sinan Aral (MIT)

**Carrot or Stick? : The Effect of Weather-based Mobile Interventions on Physical Activity.** Nakyung Kyung (KAIST), Sanghee Lim (JHU), Byungtae Lee (KAIST).

**Peer Recognition Increases Content Generation but Reduces Content Novelty.** Gordon Burtch (University of Minnesota ), Qinglai He (Arizona State University), Yili Hong (Arizona State University), Dokyun "DK" Lee (Carnegie Mellon University).

**Bounded Effects of Pro-Environment Nudge: Evidence from Digitally Mediated Field Experiments and Natural Experiments.** Yuqian Chang (Temple University), Xueming Luo (Temple University), Zheng Fang (Sichuan University).

**The Editor vs. the Algorithm: Returns to Data and Externalities in Online News.** Jorg Claussen (LMU Munich), Christian Peukert (ETH Zurich), Ananya Sen (CMU).

**Social Influence and Habits in Exercise: A Field Experiment.** Christos Nicolaides (University of Cyprus & MIT), Dean Eckles (MIT).

**The Impact of Ride-Hailing Services on Congestion: Evidence from Indian Cities.** Saharsh Agarwal (CMU), Deepa Mani (ISB), Rahul Telang (CMU).

**Reducing the Spread of Information We (should) Know is Wrong.** Gordon Pennycook (University of Regina), Ziv Epstein (MIT Media Lab), Mohsen Mosleh (MIT Sloan School), Antonio Arechar (MIT Sloan School), David Rand (MIT Sloan School).

4:30pm Coffee Break (7th Floor)

5:00pm Plenary Session 4 (7th Floor)

Session Chair: Dean Eckles (MIT)

**The A/B Effect: Objecting to Experiments that Compare Two Unobjectionable Policies or Treatments.** Michelle Meyer (Geisinger Health System)

**Adaptive Experimentation at Scale.** Eytan Bakshy (Facebook)



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## Saturday, November 2

6:15pm **Poster Session and Reception (7th Floor)**

**Optimal Design For Experiments with Large Continuous Action Spaces.** Qing Feng (Facebook), Eytan Bakshy (Facebook).

**A/B Testing on Surrogate Metrics: Mistakes and Remedies.** Weitao Duan (LinkedIn Corporation), Shan Ba (LinkedIn Corporation)

**Digital Fingerprints of Cognitive Reflection: A hybrid lab-field study of sharing on Twitter.** Mohsen Mosleh (MIT), Gordon Pennycook (University of Regina), Antonio A. Arechar (MIT), and David G. Rand (MIT).

**Promoting Public Engagement Against Corruption in Mexico.** Antonio A. Arechar (MIT), Mohsen Mosleh (MIT), David Rand (MIT).

**AI Chatbot For Sales Call Automation and Quality Improvement in Voice Commerce.** Siliang Tong (Temple), Xueming Luo (Temple), Zheng Fang (Sichuan University), Zhe Qu (Fudan University).

**Attraction Effect in Online Flight Booking.** Ismael Rafai (Universite Cote d'Azur, GREDEG), Thierry Delahaye (Amadeus), Zakaria Babut-sidze (Universite Cote d'Azur, SKEMA), Nobuyuki Hanaki (Universite Cote d'Azur, GREDEG), Rodrigo Acuna-Agost (Amadeus).

**CARS: Covariate Assisted Ranking and Screening for Large-Scale Two-Sample Inference.** Tony Cai (uPenn), Wenguang Sun (USC), Weinan Wang (Snap Inc.).

**Push versus Pull Technologies in Location-Based Mobile Targeting: Evidence from Field Experiments.** Dominik Molitor (Fordham), Martin Spann (LMU Munich), Anindya Ghose (NYU), Philipp Reichhart (LMU Munich).

**Optimizing Product Recommendations with Price Information: Experimental Evidence from an Online Product Recommendation System.** Anuj Kumar (Univ. of Florida), Xiang Shawn Wan (Univ. of Florida).

**The Paradox of Openness: Efficiency vs. Exposure of APIs.** Seth G Benzell (MIT), Jonathan Hersh (Chapman), Guillermo Lagarda (Inter-american Development Bank), Marshall Van Alstyne (BU).

**Dynamic Field Experimentation of Algorithm or Human Recommendation and Promotion on A Digital Platform.** Han Chen (Temple University), Xueming Luo (Temple University), Hanbing Xue (University of Science and Technology of China), Yongjun Li (University of Science and Technology of China).

**Fear of Losing Financial Information? Testing the Enhanced APCO Framework in the Context of Mobile Banking.** Marco Terlizzi (Fundação Getulio Vargas), Laura Brandimarte (University of Arizona), Otavio Prospero Sanchez (Fundação Getulio Vargas), Sue Brown (University of Arizona).

**How to Design AI Chatbot for Health Care Marketing.** Xueming Luo (Temple University), Haizhong Wang (Sun Yat-sen University), Yajing Huang (Sun Yat-sen University).

**The instructor reads what you write: Encouraging introductory programming students to engage in self-explanation online.** Jaemarie Solyst (Toronto), Yuya Asano (Toronto), Joseph Jay Williams (Toronto).

**Effects of Content Sourcing Strategy on Online News Subscription.** Xiaoli Yang (Boston University), Nachiketa Sahoo (Boston University).

**Does Mobile Use Reduce Cognitive Accuracy? It Depends on Cognitive Load.** Naama Ilany-Tzur (Ben-Gurion University) and Lior Fink (Ben-Gurion University).

**Online Surveys and Digital Demography in the Developing World: Facebook Users in Kenya.** Katherine Hoffmann Pham (NYU Stern School of Business), Francesco Rampazzo (University of Southampton and Max Planck Institute for Demographic Research), Leah R. Rosenzweig (Institute for Advanced Study in Toulouse and MIT GOV/LAB).



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**AI Resistance and Price Discrimination.** Yi Liu (Wharton), Pinar Yildirim (Wharton), John Zhang (Wharton).

**The Impact of an Augmented-Reality Game on Local Businesses: A Study of Pokémon Go on Restaurants.** Vandith Pamuru (Purdue University), Warut Khern-am-nuai (McGill University), Karthik Kannan (Purdue University).

**Conversational Receptiveness: Improving Engagement with Opposing Views.** Michael Yeomans (HBS), Julia Minson (HKS), Hanne Collins (HBS), Frances Chen (UBC) & Francesca Gino (HBS).

**How Does Big Data Impact Small Investors' Decision Quality? Evidence from a Natural Experiment.** Taha Havakhor (Temple), Mohammad Saifur Rahman (Purdue), Tianjian Zhang (Oklahoma State), Chenqi Zhu (UC Irvine).

**How to Get a Good Deal When You Buy a Car via Email: A Randomized Field Experiment.** Tawfiq Alashoor (University of Notre Dame) Vitali Mindel (Virginia Tech), Roberto Mora Cortez (Southern Denmark University).

**An Interpretable Approach of Predicting Consumer's Omnichannel Activity Leveraging Trajectory Data.** Chenshuo Sun (NYU), Anindya Ghose (NYU), Xueming Luo (Temple).

**Building Features Which Benefit Every Member: Measuring Inequality in the Individual Treatment Effects in Online Experiments.** Amir Sepehri (LinkedIn), Guillaume Saint-Jacques (LinkedIn).

**Cross-Sampling Physical Products Through E-Commerce Warehouses: Experimental Evidence from Alibaba.** Brian Rongqing Han (USC), Leon Chu (USC), Tianshu Sun (USC), Lixia Wu (Alibaba).

**Sequential Social Media Advertising.** Parshuram Hotkar (The University of Texas at Austin), Rajiv Garg (The University of Texas at Austin).

**Ax: A domain-agnostic platform for adaptive experimentation.** Eytan Bakshy (Facebook), Lili Dworkin (Facebook), Brian Karrer (Facebook), Konstantin Kashin (Facebook), Benjamin Letham (Facebook), Ashwin Murthy (Facebook), Shaun Singh (Facebook).



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