

THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Information Systems, Business Statistics and Operations Management

IS SEMINAR ANNOUNCEMENT



The Critical Challenge of Using Large-scale Digital Experimentation Platforms for Scientific Discovery

by

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TIME	10:30 am - 12:00 noon
VENUE	4/F Meeting Room (Room 4047), LSK Business Building

ABSTRACT

Robust digital experimentation platforms have become increasingly pervasive at major technology and e-commerce firms worldwide. They allow product managers to use data driven decision-making through online controlled experiments that estimate the average treatment effect (ATE) relative to a status quo control setting and make associated inferences. As demand for experiments continues to grow, orthogonal test planes (OTPs) have become the industry standard for managing the assignment of users to multiple concurrent experimental treatments in companies using large-scale digital experimentation platforms. In recent years, firms have begun to recognize that test planes might be confounding experimental results, but nevertheless, the practical benefits outweigh the costs. However, the uptick in practitioner-led digital experiments has coincided with an increase in academic-industry research partnerships, where large-scale digital experiments are being used to scientifically answer research questions, validate design choices, and/or to derive computational social science-based empirical insights. In such contexts, confounding and biased estimation may have much more pronounced implications for the validity of scientific findings, contributions to theory, building a cumulative literature, and ultimately practice. The purpose of this issues and opinions (IGO) article is to shed light on OTPs – in our experience, most researchers are unaware how such test planes can lead to incorrect inferences. We use a case study conducted at a major e-commerce company to illustrate the extent to which interactions in concurrent experiments can bias ATEs, often making them appear more positive than they actually are. We discuss implications for research, including the distinction between practical industry experiments and academic research, methodological best practices for mitigating such concerns, and transparency and reproducibility considerations stemming from the complexity and opacity of large-scale experimentation platforms. More broadly, we worry that confounding in scientific research due to reliance on large-scale digital experiments, meant to serve a different purpose, is a microcosm of a larger epistemological confounding regarding what constitutes a contribution to scientific knowledge.

BIOGRAPHY

Ahmed Abbasi is the Giovanini Endowed Chair Professor in the Department of IT, Analytics, and Operations in the Mendoza College of Business at the University of Notre Dame. He serves as Co-Director of the Human-centered Analytics Lab (HAL) and directs the PhD program in Analytics. Prior to joining Notre Dame, he was an Endowed Chair, Associate Dean, and Director of the Center for Business Analytics at the University of Virginia. Ahmed received his Ph.D. in Information Systems from the Artificial Intelligence (AI) Lab at the University of Arizona.

He has over twenty years of experience pertaining to machine learning and predictive analytics, with applications in health, online communities, and digital user experience. Ahmed's research has been funded by over a dozen grants from the U.S. National Science Foundation and industry partners such as AWS, Microsoft, eBay, and Oracle. He has also received the IEEE Technical Achievement Award, INFORMS Design Science Award, IBM Faculty Award, and Kemper Professor Award for his work on human-centered AI.

Ahmed has published over 100 articles in top journals and conferences, won best paper awards at AIS, MISQ, ISR, and WITS, and was a finalist for the AMA's Hunt/Maynard Award. His work has been featured in various media outlets including the Wall Street Journal, Harvard Business Review, the Associated Press, WIRED, CBS, and Fox. Ahmed serves as a senior or associate editor for various INFORMS, IEEE, and ACM journals, and was a past Chair of the INFORMS College on AI. He has also served as co-founder or advisory board member for multiple predictive analytics companies.