

The Hong Kong University of Science and Technology

Department of Information Systems, Business Statistics and Operations Management

Seminar Announcement



Causal Decision Making and Causal Effect Estimation Are Not the Same... and Why It Matters

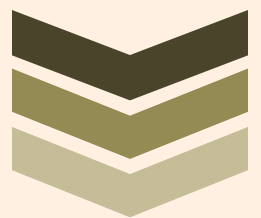
by

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The Hong Kong University of Science & Technology

Date : **Wednesady, 27 April 2022**
Time : **9:30 am - 11:00 am (Hong Kong Time)**
[Click here to join Zoom](#)
Zoom Details : **Meeting ID: 983 0368 4362**
Passcode: 187956



Abstract:

Causal decision making (CDM) at scale has become a routine part of business, and increasingly, CDM is based on machine learning. Businesses algorithmically target offers, incentives, and recommendations to affect consumer behavior. Recently, we have seen an acceleration of research related to CDM and causal effect estimation (CEE) using machine-learned models. This article highlights an important perspective: CDM is not the same as CEE, and counterintuitively, accurate CEE is not necessary for accurate CDM. Technically, the estimand of interest is different, and this has important implications both for modeling and for the use of statistical models for CDM. In this talk, I will highlight three implications. (1) We should carefully consider the objective function of the causal machine learning, and if possible, optimize for accurate “treatment assignment” rather than for accurate effect-size estimation. (2) Confounding affects CDM and CEE differently. The upshot here is that for supporting CDM it may be just as good or even better to learn with confounded data as with unconfounded data. (3) Causal statistical modeling may not be necessary at all to support CDM because a proxy target for statistical modeling might do as well or better. This third observation helps to explain at least one broad common CDM practice that seems “wrong” at first blush—the widespread use of noncausal models for targeting interventions. The last two implications are particularly important in practice, as acquiring (unconfounded) data on both “sides” of the counterfactual for modeling can be quite costly and often impracticable. These observations also open substantial research ground that I will discuss at the end of the talk.

Bio:

Carlos Fernández-Loría is an Assistant Professor of Information Systems at the HKUST Business School. His research focuses on the use of data-driven models to make better targeting decisions. He has worked on research projects with companies in various industries, including Spotify (music), Via (ridesharing), Dstillery (digital advertising), and BAC Credomatic (banking). The results of his research have been presented at multiple conferences worldwide and published in top academic journals such as Information Systems Research, MIS Quarterly, and the Journal of Machine Learning Research. Before conducting his doctoral studies, he worked as a software engineer on projects for several multinational corporations, such as Procter & Gamble, Real Madrid, Disney, Zynga, and Nissan. Carlos received his PhD in Information Systems from the NYU Stern School of Business.