



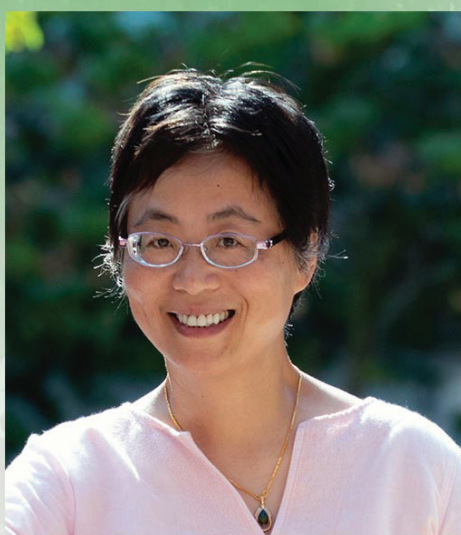
香港中文大學統計學系

Department of Statistics

THE CHINESE UNIVERSITY OF HONG KONG

DISTINGUISHED LECTURE

De-confounding Causal Inference using Latent Multiple-mediator Pathways



Professor Annie QU

Chancellor's Professor
Department of Statistics
University of California Irvine

Brad and Karen Smith Professorial Scholar by the College of LAS
at UIUC

NSF Career Award in 2004-2009

Fellow of the Institute of Mathematical Statistics

Fellow of the American Statistical Association

Fellow of American Association for the Advancement of Science

2024 IMS Medallion Award and Lecturer

Date: 6 July 2023 (Thursday)

Time: 11:00 am — 12:00 pm

Venue: LT2, Lady Shaw Building,
The Chinese University of Hong Kong

Abstract

Causal effect estimation from observational data is one of the essential problems in causal inference. However, most estimation methods rely on the strong assumption that all confounders are observed, which is impractical and untestable in the real world. We develop a mediation analysis framework inferring the latent confounder for debiasing both direct and indirect causal effects. Specifically, we introduce generalized structural equation modeling that incorporates structured latent factors to improve the goodness-of-fit of the model to observed data, and deconfound the mediators and outcome simultaneously. One major advantage of the proposed framework is that it utilizes the causal pathway structure from cause to outcome via multiple mediators to debias the causal effect without requiring external information on latent confounders. In addition, the proposed framework is flexible in terms of integrating powerful nonparametric prediction algorithms while retaining interpretable mediation effects. In theory, we establish the identification of both causal and mediation effects based on the proposed deconfounding method. Numerical experiments on both simulation settings and a normative aging study indicate that the proposed approach reduces the estimation bias of both causal and mediation effects.

★★★★★ All are welcome ★★★★★

For enquiries please contact Miss Esther TAM (Tel: 3943 7931)
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