INSTITUTE OF STATISTICAL SCIENCE

Orientation Seminar

Title：Proximal Causal Inference

Speaker：Dr. Andrew Ying
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Time：10:30 AM~12:00 PM, Wednesday, Jan 11, 2023

Place：Auditorium, B1F, Institute of Statistical Science

Abstract

Unmeasured confounding is the central complication of causal inference resulting from unknown common operating mechanism over both uncontrolled treatment received and response. It contaminates association between treatment and response, rendering which useless for causal interpretation. Therefore, a standard assumption for causal inference is that one has measured sufficient covariates to ensure that within covariate strata, subjects are exchangeable across observed treatment values, also known as ``no unmeasured confounders (NUC)''. NUC is often criticized as it requires one to accurately measure all confounders. Realistically, measured covariates can rarely capture all underlying confounding resources with certainty. Often covariate measurements are at best proxies of confounders, thus invalidating inferences under NUC. In this talk, I will introduce the proximal causal inference (PCI) framework that is designed to tame such confounding, with examples starting from point exposure observational studies to longitudinal studies. The PCI offers an opportunity to learn about causal effects in settings where NUC based on measured covariates fails, by formally accounting for the covariate measurements as imperfect proxies of underlying confounding mechanisms. Based on PCI, I establish nonparametric causal identification with a pair of proxies upon which I construct estimators including doubly robust estimators. Finally, I briefly discuss how the proximal framework can be generalized to cover fields outside of causal inference.

※Online live streaming through Cisco Webex will be available.
※ The tea reception will be held at 10:10.