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Kevin Josey
CU Anschutz

Title: Causal Inference using Variables Measured with Error

Abstract: In both the scientific application and development of causal inference methods, it is often implicitly assumed that all relevant variables are measured without error. However, in many contexts obtaining error-free measurements of an outcome, exposure, or confounding variable may be unreasonable or even impossible. In these scenarios, the presence of measurement error can subsequently invalidate fundamental assumptions necessary for causal inference. Despite the extensive literature studying the impact of measurement error in associational studies, the development of methods at the intersection of measurement error and causal inference is in a relatively early stage. This presentation will first examine a variety of methods for addressing measurement error in causal analyses. Subsequently, we propose implementing a class of estimators applicable to general causal quantities that is conventionally used for unmeasured confounding to instead address bias induced by measurement error. Under standard double sampling schemes, the proposed estimator is shown to be competitive with existing approaches in a simulation study. We illustrate our method with observational electronic health record data on HIV outcomes from the Vanderbilt Comprehensive Care Clinic.