

**University of Chicago and Toyota Technological Institute at Chicago  
Machine Learning Seminar Series**

**PRESENTS:**



**Yixin Wang, PhD Student  
Columbia**

**Title:** The Blessings of Multiple Causes

**Abstract:** Causal inference from observational data is a vital problem, but it comes with strong assumptions. Most methods assume that we observe all confounders, variables that affect both the causal variables and the outcome variables. But whether we have observed all confounders is a famously untestable assumption. We describe the deconfounder, a way to do causal inference from observational data allowing for unobserved confounding.

How does the deconfounder work? The deconfounder is designed for problems of multiple causal inferences: scientific studies that involve many causes whose effects are simultaneously of interest. The deconfounder uses the correlation among causes as evidence for unobserved confounders, combining unsupervised machine learning and predictive model checking to perform causal inference. We study the theoretical requirements for the deconfounder to provide unbiased causal estimates, along with its limitations and tradeoffs. We demonstrate the deconfounder on real-world data and simulation studies.

**Bio:** Yixin Wang is a PhD student in the Statistics Department of Columbia University, advised by Professor David Blei. Her research interests lie in Bayesian statistics, machine learning, and causal inference. Prior to Columbia, she completed undergraduate studies in mathematics and computer science at the Hong Kong University of Science and Technology. Her research has received several awards, including the INFORMS data mining best paper award, student paper awards from American Statistical Association Biometrics Section and Bayesian Statistics Section, and the ICSA conference young researcher award.

**Host:** Karen Livescu

**Friday, February 07, 10:30 – 11:30 am  
TTIC Rm 526  
(Remote broadcast at JCL Rm 390)**