

**MICHIGAN STATE UNIVERSITY**  
Department of Statistics and Probability

# COLLOQUIUM

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## The Promises of Parallel Outcomes

Thursday, February 9, 2023  
10:20 AM - 11:10 AM [Eastern Time](#)  
C405 Wells Hall, Simulcast to Zoom

### Abstract

A key challenge in causal inference from observational studies is the identification and estimation of causal effects in the presence of unmeasured confounding. In this talk, I will introduce a novel approach for causal inference that leverages information in multiple outcomes to deal with unmeasured confounding. The key assumption in this approach is conditional independence among multiple outcomes. In contrast to existing proposals in the literature, the roles of multiple outcomes in the key identification assumption are symmetric, hence the name parallel outcomes. I will show nonparametric identifiability with at least three parallel outcomes and provide parametric estimation tools under a set of linear structural equation models. The method is applied to a data set from Alzheimer's Disease Neuroimaging Initiative to study the causal effects of tau protein level on regional brain atrophies.

### Bio

Ying Zhou is a fifth-year Ph.D. student in Statistics at the University of Toronto. She received her M.A. in Mathematics of Finance from Columbia University, and B.S. in Mathematics and B.A. in Economics from Wuhan University. She has received the IMS Hannan Graduate Student Travel Award in 2021. Her research interests focus on causal inference and interdisciplinary data science.

Zoom details can be found at: <https://stt.natsci.msu.edu/stt-colloquium-zoom-info2/>

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