Masterclass in Bayesian Causal Inference
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Seminar Room 605, Level 6, FBE Building
111 Barry Street, Carlton, VIC 3053

Bayesian Causal Inference

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This course deals with Bayesian inference, in observational data settings, about the effect of a binary treatment variable on an outcome of interest. The goal is to provide an understanding of the role of Bayesian thinking for tackling this problem. Relevant materials, in the form of published and unpublished papers, will be circulated at the start of the course. To facilitate learning, illustration of the methods in live computer presentations will also be provided. The course will be helpful for students and researchers in economics and the social sciences, and fields that utilize observational data in their research.

Program

9:30 - 11:00 Session 1: **Bayesian and Causal Inference Precepts**

An introduction to ideas surrounding Bayesian inference techniques - prior modeling, function non-parametrics, computation, and model choice - and the issues surrounding causal inference in observational data settings.

11:00 - 11:15 Tea Time

11:15 - 12:45 Session 2: **Inference Under Conditional Ignorability**

A discussion of a Bayesian framework for estimating the average treatment effect when the treatment is independent of the potential outcomes given covariates. Comparison with frequentist propensity score matching illustrated in an example with a large number of covariates

12:45 - 14:00 Lunch

14:00 - 15:30 Session 3: **Inference with Unobserved Confounders**

Formulation of the principal stratification approach and inference for the complier average treatment effect. Framework illustrated in depth in an example dealing with panel outcomes and treatment at baseline.

15:30 - 15:45 Tea Time

15:45 - 17:15 Session 4: **Inference in the Sharp and Fuzzy RD Designs**

Bayesian approach for these designs based on nonparametric modeling of the effects of the forcing variable, novel placement of knots and smoothness prior. Illustrations and comparisons with the frequentist approach are included.