ABS23: BAYESIAN CAUSAL INFERENCE

DiSIA - Department of Statistics, Computer Science, Applications - viale Morgagni 59, Firenze

12-16 June 2023

Monday 12

13.00	Registration
14.00-16.00	Lecture: Introduction to the potential outcomes framework; Fisher's and Neyman's perspectives
16.00-16.30	Coffee break
16.30-18.00	Lecture: The Frequentists' world (part 1) on randomized experiments: covariate adjustment, stratified RCT, imputation
18.00-19.00	Practical session: analysis of randomized experiments

Tuesday 13

9.00-10.30	Lecture: The Frequentists' world (part 2) on observational studies: propensity score, matching, weighting, outcome modeling, double-robust estimation
10.30-11.00	Coffee break
11.00-12.30	Practical session 1: common frequentists methods, e.g. matching and weighting, PSweight (including weighting and DR) and matching packages
12.30-14.00	Lunch
14.00-15.00	Lecture: Basic structure of Bayesian causal inference
15.00-15.15	Comfort break
15.15-16.30	Practical session 2: Basics of Bayesian causal inference, including RCT imputation, different versions of estimands and complex estimands
16.30-17.00	Coffee break
17.00-19.00	Participants' posters

Wednesday 14

9.00-9.30	Lecture: Role of PS
9.30-10.30	Practical session 1: Basics of Bayesian causal inference (Veronica Ballerini)
10.30-11.00	Coffee break
11.00-12.00	Heterogeneous treatment effects/machine learning
12.00-12.15	Comfort break
12.15-13.15	Practical session 2: practice of methods for heterogeneous treatment effects (Giacomo Petrillo)
13.15-	Free afternoon and evening

Thursday 15

9.00-10.30	Lecture: Sensitivity analysis
10.30-11.00	Coffee break
11.00-12.30	Lecture: Instrumental variables
12.30-14.00	Lunch
14.00-15.30	Lecture: Principal Stratification
15.30-16.00	Coffee break
16.00-18.00	Practical session: inference of principal stratification and PStrata
19.30-	Farewell dinner

Friday 16

9.00-10.30	Lecture: Causal inference with Bayesian time series models (Fiammetta Menchetti)
10.30-11.00	Coffee break
11.00-12.30	Practical session: Causal inference with Bayesian time series models
12.30-13.00	Wrap up

IMPORTANT NOTE

It is important to have your own PC for the practical lessons. Remember to take it with you before leaving. Please install the following software on your PC in advance to start your lessons smoothly:

- R and R packages: PSweight, PStrata, Matching
- Stan

REFERENCES

1. Ding P, Li F. 2018. Causal inference: a missing data perspective. Statistical Science. 33(2), 214-237.

2. Li F, Ding P, Mealli F. 2022. Bayesian causal inference: a critical review. Philosophical Transactions of the Royal Society A. 381 (2247). 2022.0153 arXiv:2206.15460.

3. Linero AR, Antonelli JL. 2022. The how and why of Bayesian nonparametric causal inference. Wiley Interdisciplinary Reviews: Computational Statistics, e1583.