

**Causal machine learning Masterclass**

In collaboration with the Centre for Statistical Methodology and London School of Hygiene and Tropical Medicine

3 March 2020

**Agenda**

The British Library   
96 Euston Road, NW1 2DB, UK

The Alan Turing Institute is located on the first floor of the British Library and can be accessed via the main doors from 9:30 onwards. Please allow 10 minutes for queuing when planning your journey.

10:00 - 10:30 Registration, tea and coffee

**10:30 – 12:00 Session One: What?**

* Introduction
* Estimating the average treatment affect (ATE)
* Super Learner
* Why naïve machine learning is problematic
* Targeted maximum likelihood estimation (TMLE) for the ATE

**12:00 – 13:00 Lunch**

**13:00 – 14:30 Session Two: Why?**

* Asymptotic reasoning for the plug-in bias, and for why doubly robust estimators are less vulnerable
* The broader picture: plug-in estimators for conditional average treatment effects
* Comparison of TMLE for the ATE with machine-learning plug-in doubly robust estimators and the role of sample splitting

**14:30 – 14:45 Coffee break**

**14:45 – 16:00 Session 3: Generality of TMLE**

* Generality of TMLE/CV-TMLE
* Highly Adaptive Lasso (HAL)
* Standard survival setting and optimal dynamic treatment for survival

**16:00 – 16:15 Comfort break**

**16:15 – 17:30 Session 4: TTMLE for causal inference with longitudinal data with intercurrent events**

* Expanding the survival setting to longitudinal data with time-dependent confounding
* TMLE in this setting