Seminar on Causal Inference

**Topic**: Causal Inference in Statistics and ML

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**Typical examples** are (Pearl, 2009):

- What was the death cause of a given individual, in a specific incident?
- What fraction of crimes could have been avoided by a given policy?
- What is the effect of smoking on mortality in a given population?
- Take for example the latter: Using, e.g., Cox regression, we can predict survival probabilities of a current smoker.
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- Take for example the latter: Using, e.g., Cox regression, we can predict survival probabilities of a current smoker. But this does not tell us anything about the causal smoking effect on mortality as smoking is not a factor that can be assigned in randomized experiments (and smokers and non-smokers can usually not only be distinguished by smoking status).
However, there has been a lot of work on causal inference in the past decades and

the aim of this seminar is to jointly work out

- some of its basic concepts and ideas
- and to understand methods for quantifying causal effects.

The seminar is based on the following open-access books

Registration

- The seminar is eligible for Master students in Statistics, Data Science and Econometrics who have a decent understanding of probabilistic and statistical concepts and linear algebra.
- Moreover, some of the early topics are suitable for interested statistics students in their last Bachelor year.
- Binding Registration is already possible by mail to: sia.statistik@tu-dortmund.de with matriculation number and degree program.