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„Aktuelle FF der Ökonometrie"
(„Topics in Applied Microeconometrics")
SS 2022

Prof. Viktor Steiner

Aim of the seminar

The topic of the seminar is "**Machine Learning Methods in Applied Microeconometrics**". ML-Methods are mainly used for producing good out-of-sample predictions, although recent developments in "causal" ML aimed at estimating "structural" parameters and "treatment" effects are becoming increasingly popular among economists. Examples of ML applications in empirical economics include:

- Estimation of hedonic price equations (house prices, rents, wages, ...)
- Demand system estimation with many goods and prices
- Credit scoring
- Predicting unemployment and health risks
- Modeling nonresponse in household surveys
- Selecting control variables for the estimation of "treatment" effects
- Selecting instrumental variables for endogenous regressors

A good introductory survey of ML methods in economics is: *S. Mullainathan.& J. Spiess* (2017): Machine Learning: An Applied Econometric Approach. Journal of Economic Perspectives 31(2), 87–106.
A good introductory textbook (downloadable from the internet free of charge) is: *G. James et al.* (2017): An Introduction to Statistical Learning. Springer Texts in Statistics.

In the first meeting, I will provide an introduction to ML methods relevant for the seminar.

Requirements
Basic knowledge of microeconometrics at the level of our MSc Economics course "Applied Microeconometrics" is assumed. All topics require the use of a statistical software package such as Stata or R. (Stata is made available by the university free of charge, R is an open-access package with more powerful ML tools than Stata).
Each student is expected to write a term paper applying ML-methods to an ecnomic application and present her/his on-going work in two seminar presentations. The paper may be a replication of an earlier study form the above list of topics based on data used in the reference study or alternative data sets, or an original study (more difficult). Access to data from the Socioeconomic Panel of DIW Berlin will be provided. Own research topics applying ML-methods may also be suggested by the student, if appropriate for the seminar. The paper should be about 15 pages

including figures and tables, relevant supplementary material can be included in an Appendix. Grading will be based solely on the paper. The paper and the presentations may be in English or German.

Timetable

Due to the on-going Corona crisis, the seminar will be in the form of three Webex meetings:

- The **first meeting** on **Wednesday, 20th April, 2 – 3.30 p.m.** will provide an introduction to ML and presentation of potential topics for seminar papers.
- In the **second meeting** on **Friday, 27th May, 9 a.m.- 1 p.m.**, students will briefly present their research topic including a summary of previous research, the proposed methodology, data to be used, and perhaps already some preliminary descriptive analyses (~20 min).
- In the **third meeting** on **Friday, 8th July, 9 a.m.- 4 p.m.**, a fairly complete version of the seminar paper will be presented and discussed (~30 min).
- The *final paper* is due on **31th Ausgust**.

Inquires about the seminar to: viktor.steiner@fu-berlin.de