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Freie Universität Berlin

Fachbereich Wirtschaftswissenschaft
Univ.-Prof. Dr. Viktor Steiner
Empirische Wirtschaftsforschung und Wirtschaftspolitik
Boltzmannstr. 20 • D-14195 Berlin

Tel.: 030 838 54371
Fax: 030 838 54873
Email: viktor.steiner@fu-berlin.de
Web: http://www.fu-berlin.de/wifo/

„Aktuelle FF der Ökonometrie / Empirischen FiWi und Wipo“ („Topics in Applied Microeconometrics / Empirical Public Economics”) SS 2018

Prof. Viktor Steiner, Benjamin Fischer, Dominik Hügle

Aim of the seminar

The seminar is on **Machine Learning (or Statistical Learning)** applications in applied microeconometrics. ML is a well-established field in statistics and mainly concerned with statistical methods for producing optimal out-of-sample predictions by data driven selection of the included set of explanatory variables, functional form of regression equations and classification (e.g., logit) models. More recently, ML applications have also become popular in the estimation of “causal effects”, i.e. “treatment effect” estimation. Standard ML methods are implemented in STATA and, especially, R. A brief introduction to the seminar and possible research topics (see list below) are presented by the organizers at the preliminary meeting (“Vorbesprechung”).

Research topics:

1. Applications of ML regression methods to the estimation of hedonic price equations (rents, wages)
2. Applications of ML classification methods to the estimation of discrete-choice models (labor supply, educational choice, overeducation/educational mismatch, marriage/divorce, fertility)
3. ML estimation of heterogenous treatment effects under selection on observables
4. ML and Instrumental Variable estimation of treatment effects

References

James et al., An introduction to statistical learning, Springer Texts in Statistics (all the methods covered in the seminar are contained at an intermediate level in this standard reference; for a summary of ML see Ch. 2.1 and 2.2.);
free legal download: http://www-bcf.usc.edu/~gareth/ISL/ISLR%20First%20Printing.pdf

Cameron, A.C., Machine Learning for Microeconometrics (concise summary of the main topics covered in the seminar, and more):
http://cameron.econ.ucdavis.edu/e240f/trmachinelearningseminar.pdf

Mullainathan, S., J. Spiess, Machine Learning: An Applied Econometric Approach, J. Economic Perspectives, 31/2, 87-106.

Athey, S., G. Imbens, Machine Learning Methods for Estimating Heterogenous Causal Effects.
https://pdfs.semanticscholar.org/86ce/004214845a1683d59b64c4363a067d342cac.pdf

Belloni, A. et al., High-Dimensional Methods and Inference on Structural and Treatment Effects. J. Economic Perspectives, 31/2, 29-50.

Requirements

Knowledge of microeconometrics at the level of the MSc Economics course "Applied Microeconometrics" is assumed. Each student is expected to write an empirical paper applying one of the ML methods from the list of suggested research topics and present it in the seminar. Own research topics may also be suggested by the student if appropriate for the seminar. In addition to the preliminary meeting, there will be two meetings: In the first of these 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 results. In the second meeting completed papers will be presented and discussed. The final paper is due a couple of weeks after this second meeting. The paper and the presentation may be in English or German. The grade will be made up of the final paper, the presentation of the paper, and the participation in the seminar. The paper should be about 15 pages including figures and tables. Relevant supplementary material can be included in an Appendix.

Time table

- ***Preliminary meeting***: Tuesday, 18 April, 16:00 – 17:30, Kaminzimmer, Boltzmannstr. 20

- ***Second meeting***: Friday, 8 June, 9:00 – 16:00, Kaminzimmer, Boltzmannstr. 20

- ***Third meeting***: Thursday, 12 July, 9:00 – 17:00, Henry-Ford-Bau/K III Konferenzraum and Friday, 13 July, 9:00 - 16:00, Kaminzimmer, Boltzmannstr. 20

- ***Completed paper due***: Mid-August

Inquiries about the seminar to: dominik.huegle@fu-berlin.de or
benjamin.fischer@fu-berlin.de