FRIEDRICH-ALEXANDER
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Lehrstuhl für Wirtschaftspolitik
FAU Erlangen-Nürnberg

Applying Unsupervised Machine Learning in Social Science Experiments

Master Thesis

Short description:
For students in mathematics, business mathematics, or business informatics, the Chair of Economic Policy offers a master thesis on empirical methods for social experiments. The goal is to implement a new method for assigning treatments and to compare it to existing methods.

Detailed description:
In a typical social science experiment, researchers take a group of participants and randomly split them into treatment and control group. Only the treatment group receives the treatment. Finally, researchers analyze this experimental data to estimate the effect of the treatment on a certain dependent variable of interest.

This thesis targets the assignment of treatments, i.e., the split into treatment and control group. Suppose each participant is characterized by a vector of known covariates such as age, gender, etc. Then, to precisely estimate the effect of the treatment, treatment and control group should be as identical as possible with respect to the covariates. This is very intuitive: We want to compare a group that did not receive the treatment to a similar (or even identical) group that did receive the treatment. If we split the groups randomly, there is always the possibility to receive groups that are not similar. Consequently, there is a demand for algorithms that ensure similar groups.

This thesis focuses on the use of unsupervised machine learning methods for the task of assigning treatments. The idea is to build clusters of participants that are similar with respect to the covariates. Within these clusters, assign exactly half of the participants to the treatment group and the other half to the control group. The thesis should compare this new approach to existing approaches via Monte Carlo Simulations as well as theoretically.

Miscellaneous:
The master thesis can be written in English or German. However, English is preferred. The thesis should comprise of 30-40 pages. All further details can be discussed with the supervisor.

Applications should contain a short CV and a transcript. For application and for all kinds of questions, please contact Tobias Aufenanger (tobias.aufenanger@fau.de, 0911 5302 226).

The application deadline is 31.03.2018; an earlier start is possible.