IVT – Assignments

Head:	Prof. Dr. K.W Axhausen
Topic:	**Understanding biking shares in Swiss cities based on cycling network topologies**
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Registration:	www.ivt.ethz.ch/en/studies/downloads/assignments.html#registration

This study has the goal of evaluating cycling network metrics using graph theory methods to study the effects of different cycling network topologies on bike ridership. The students are also expected to control for other variables such as topography, socioeconomic structure and accessibility by other modes. This data is to be used to estimate regression models, using bike ridership as the dependent variable. Ideally the students estimate statistical models, in order to gain understanding of how much the independent variables influence the choices. At the same time, prediction accuracy should also be evaluated and models based on machine learning methods are also to be estimated. The students can work in R or in Python, although R is recommended especially for the model estimation by using the tidymodels framework. The data sources which are to be used are Open Street Maps as well as the Swiss Mobility Microcensus.

Tasks:

- Literature review and OSM cycling network data review. Result: definition of metrics to be used in the study.
- Development of a script to calculate the necessary network metrics. Result: Working script to calculate network metrics.
- Estimation of regression models using bike ridership as the dependent variable and network metrics as well as socioeconomic data as dependent variables. Result: Estimated models.
- Discussion of policy-relevant results for cycling promotion. Result: Policy recommendations for further developments of cycling infrastructure in Switzerland

Links:	The missing link: bicycle infrastructure networks and ridership in 74 US cities
Additional remarks:	Prior experience with the programming language R or Python is necessary.
Minimum credits:	24 ECTS
Recommended lectures:	- Transport Planning Methods - GIS - Fuss- und Veloverkehr - Readings in Transport Policy