Head:	Dr. A. Kouvelas
Topic:	**Perimeter control for urban road networks utilizing speed measurements from autonomous vehicles**
Assistant:	K. Chavoshi
Registration:	https://www.ivt.ethz.ch/en/studies/downloads/assignments.html#registration

Description

Perimeter control (or gating) is an effective real-time traffic management scheme that deals with congestion in urban environments. The idea is that we can identify a critical urban area (zone) that needs to be protected (e.g. city center). Then, the traffic lights at all the entrances (gates) of this zone can be regulated in an efficient way. In order to achieve this, we use the concept of the Macroscopic Fundamental Diagram (MFD) which is defined for urban zones. This empirical congestion tool can be utilized for an urban region in order to design real-time perimeter control schemes. In this work we investigate how the utilization of new sources of data (i.e. sensors of autonomous vehicles) can enhance the performance of the controller. New technologies are emerging in the area of connected and driverless vehicles, that can offer new real-time information (e.g. geo-located velocities) and improve our traffic control methodologies. This thesis involves extensive microsimulation experiments in order to assess the impact of this new data source.

Recommended lectures:	Road Transport Systems (Verkehr III)
Credits:	24 ECTS
Requirements:	Basic coding skills in Matlab, Python, R, or another similar programming language are required.
Extra:	Group work possible (max. 2 persons)