

At the Chair of **Logistics and Supply Chain Management** of TUM School of Management and the Chair of **Automotive Technologies** at the Department of Mechanical Engineering we are looking for an interested and qualified student to conduct his/her

Interdisciplinary Project

on the topic:

Data Analytics for Mobility: The Influence of Expected Travel Time on Modal Split between Carsharing, Taxi and Public Transportation

The academic literature usually assumes that the choice of a transportation mode (e.g., carsharing, taxi, or public transportation) depends on the travel time and transportation cost. In our database, we observe that the modal share of taxi and carsharing increases, if the underground or suburban rail is delayed. To extend our analysis to modal choice, we need travel times per mode at any given point in time. This includes two consecutive tasks: First, the possible routes for any mode at any given point in time must be established. For public transportation, this amounts to building a proper time expanded network. For road-based transportation modes, this amounts to implementing the data-driven approach of Ruch et al. (2019) for network speed estimation to build up a routing graph. Second, the actual travel times per mode for any time interval must be established by performing shortest path problems on the graph from task (1).

Selected research tasks:

- to perform a literature analysis on carsharing, taxi and public transportation
- Computation of travel times per mode
- Data analytics to establish the impact of increased travel times
- Approximation of a modal split function

Requirements:

The thesis is for Master students of the study-program Informatics. The ability to work independently as well as analytical skills are required. Proficiency in a programming language and data analytics tools (preferably Python), and knowledge of SQL are mandatory. Supervision is possible in German or English. The report should be written in English.

Begin: as soon as possible

Advisor: Layla Martin (Logistics and Supply Chain Management), Michael Wittmann (Automotive Technologies)

Application: Email with curriculum vitae and transcript of records to logtheses.wi@tum.de (TUM-BWL) or michael.wittmann@tum.de (Mechanical Engineering)

Related Literature:

Ruch, C., Hörl, S., Hakenberg, J., & Frazzoli, E. (2019). The Impact of Fleet Coordination on Taxi Operations. Working Paper