Interdisciplinary Project (IDP)

Big data analytics & machine learning:
modeling the influence of weather on bikesharing usage

Bikesharing is considered one of the most promising solutions for sustainable urban transportation. For Bikesharing operators, it is crucial to understand usage patterns in order to provide an attractive service and to optimize operations of the system. Performance can only be assessed when the influences of external factors are known. While previous studies have demonstrated a strong correlation between usage patterns and factors like weather, precipitation, or wind, it is unclear how weather intercorrelates with other factors like day of week, holidays, or strikes in public transport.
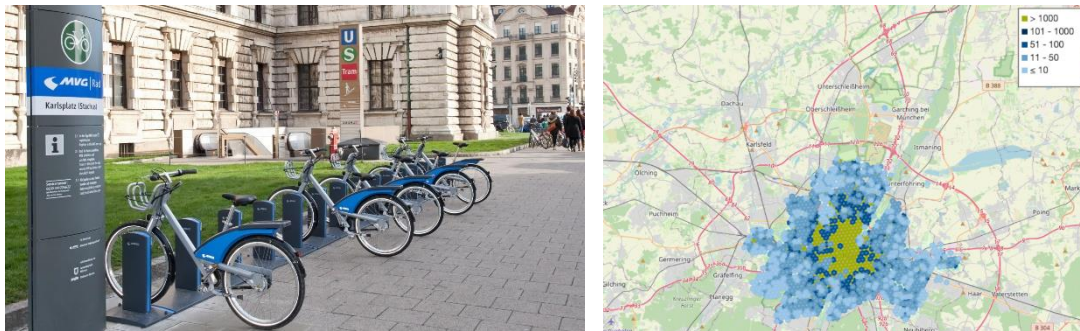
Together with experts from the MVG (operator of the Munich bikesharing-system MVG Rad), it is the goal of this IDP to analyze the factors influencing the usage of bikesharing and build a model allowing the quantitative assessment of the systems usage. The model should yield meaningful indicators and be easy to interpret by MVG employees. The goal is to be able to isolate and/or exclude factors from the performance analysis and to measure the level of influence of weather on a scale. Data of MVG (trip data of MVG Rad) and FTM (trip data of 267 bikesharing systems (26 Mio. Trips) and secondary data like weather for all cities) will be available. Further data can be collected if necessary.

The main tasks within the scope of this IDP comprise:

- Literature review on influencing factors in shared micromobility and statistical modeling
- Analysis of available data (trips and secondary data), collecting further secondary data if necessary
- Development and implementation (Python) of a model quantifying the effects of external factors on the usage of bikesharing systems
- Development of a normalized scale that reflects the level of suitability of the weather for cycling
- Applying the methodology to MVGRad as a case study and presenting the results

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