

# Analyzing Traffic Flow Data using Sensors at Signalized Intersections

## Master's Thesis of Kseniia Vinogradova

### Mentor:

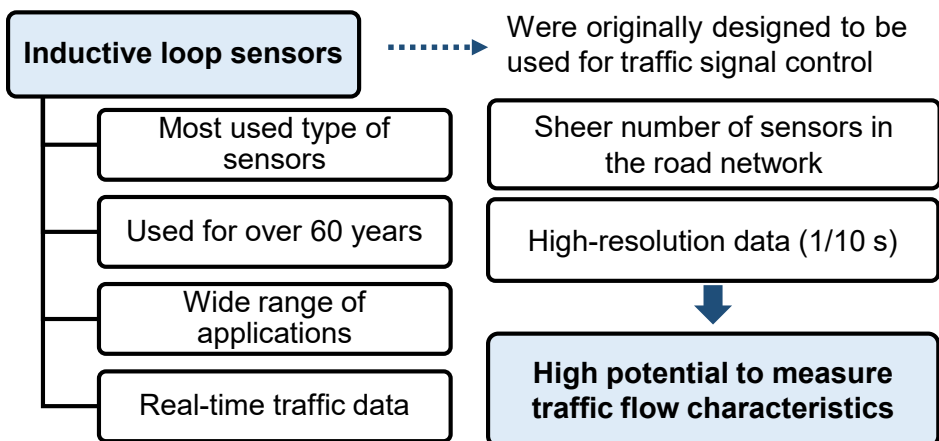
Dr.-Ing. Matthias Spangler (TUM)

### External mentors:

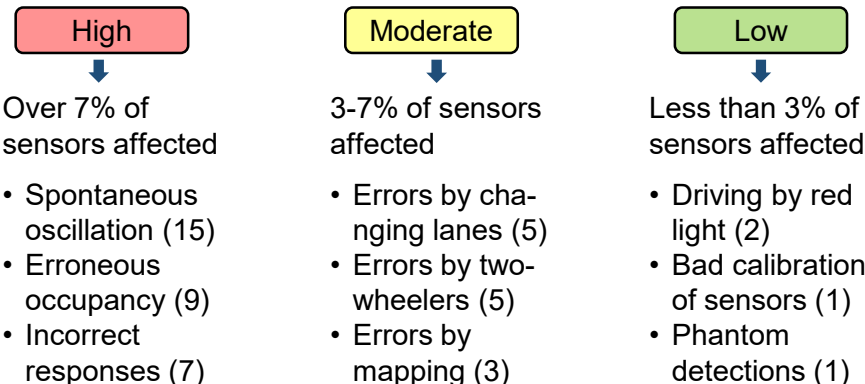
Dr.-Ing. Thomas Riedel (Verkehrs-Systeme AG)

Dr.-Ing. Jonas Lüßmann (GEVAS software GmbH)

## Introduction



## Frequency of errors (in terms of number of sensors affected)

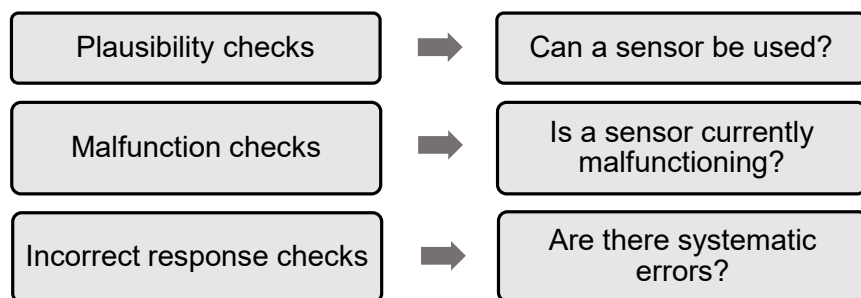


## Goals

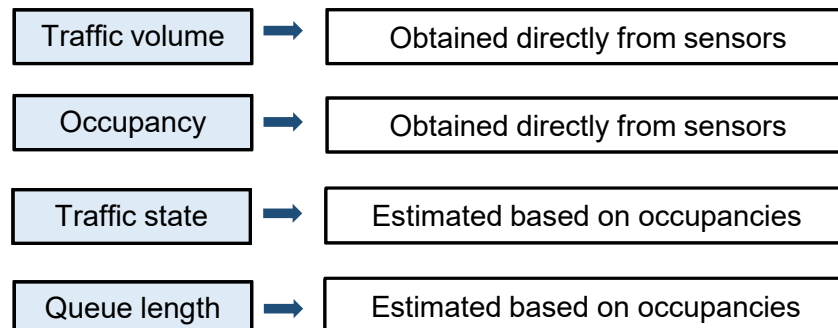
- To find which relevant traffic flow parameters can be derived from traffic signal sensors.
- To analyze quality aspects of the data and traffic flow parameters derived from it.

## Data and test methods

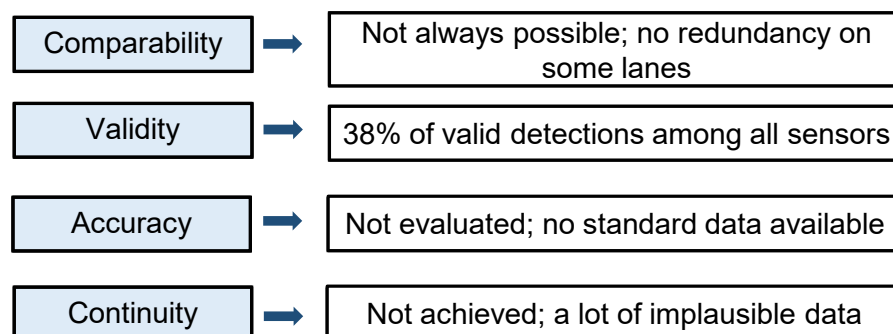
- Data from four intersections of Frankfurt on Main
- Total of 79 sensors (77 inductive loops and two video)



## Derived traffic flow parameters



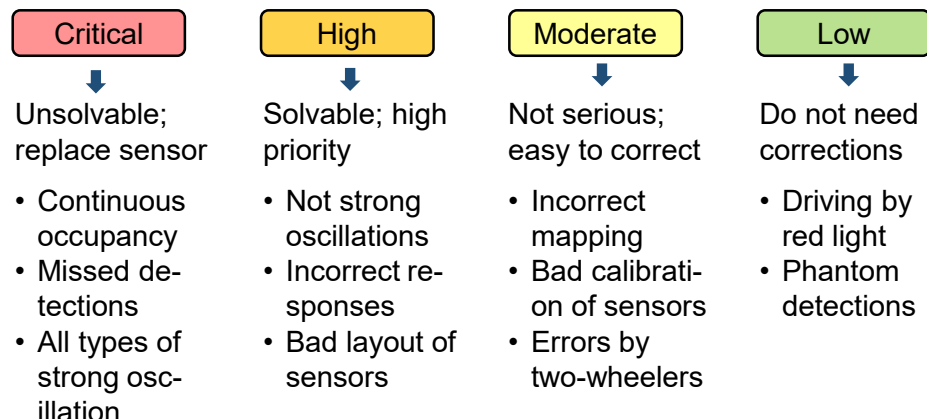
## Considered quality aspects



## Results of the analysis

Data analysis showed that over half of detections made by given sensors were implausible. As a summary, all the investigated types of errors were grouped into two kinds of classifications.

### Severity of errors



## Recommendations

- More data to get statistically reliable results
- Video recordings or live observations to find the reasons for sensors' errors
- Redundant detectors to check the comparability and then the plausibility of detections
- Standard data to find the degree of accuracy of detections
- Data from another type of sensors for evaluation of the data quality

## References

- Federal Highway Administration. [1997]: *FHWA Study tour for European traffic monitoring programs and technologies. FHWA's scanning program*, Washington D.C., USA
- Riedel, T., & Erni, K. [2016]: Do My Loop Detectors Count Correctly? A Set of Functions for Detector Plausibility Testing. In: *Journal of Traffic and Transportation Engineering*, 4(3), pages 117-130. <https://doi.org/10.17265/2328-2142/2016.03.001>