KI DATA TOOLING
The Data Kit for Automotive AI

Multi Trajectory and Context Recording

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Acquisition, Curation and Refinement of Real Data

Data Recording

The THAB Public Research Intersection in Aschaffenburg is one of the two used research intersections in the Data-Tooling project. The goal is to created shared data from different recording agents, perspectives and sensor modalities. The data is especially used to create identical synthetic cloned scenes based on the real-world recordings from the intersection measurement campaigns.

Fig.1: Multiple sensor positions and types at the Aschaffenburg Research Intersection.

Provided Data

The intersection is equipped with several high resolution cameras and LiDAR scanners to perceive and classify all road user's current location and movement. The classification system can differentiate between 8 classes, support of newer means of transport such as e-scooters are included. Moreover, a weather station and a traffic light signal status logger provide additional context data of the current ongoing situation. All road user's trajectories are provided to auto-animate object movements within the synthetic-clone world.

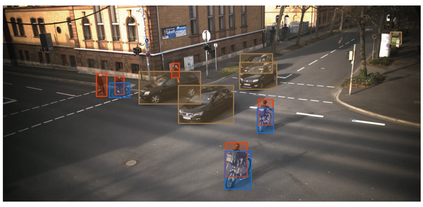

Fig.2: Camera view example, including object classification illustration.

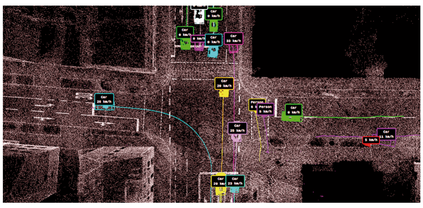

Fig.3: Illustration of combined LiDAR point clouds, with object classification and tracking.

Measurement campaigns

A total of two measurement campaigns have taken place in Aschaffenburg, collecting 350 cooperative scenarios at different seasonality, weather and daytime conditions. The data includes over 12 hours of real-world data, 2,000 VRU- and 10,000 vehicle tracks.

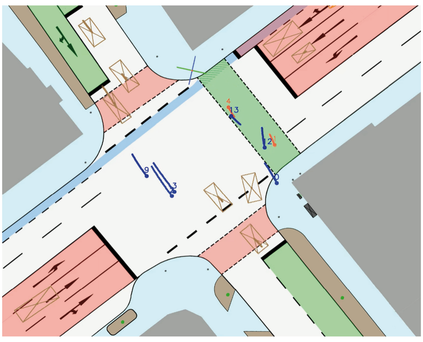

Fig.4: Representation of a fixed moment in time within an ongoing scene. Colored lines illustrate past movement routes, colored dots marked current object locations and boxes vehicle dimensions. Red are pedestrians, blue cyclist, and brown represent current vehicle locations. All traffic light status are illustrated by green, yellow and red highlighted lanes.

Lessons Learned

Arrangement and timing of all recording instances at everyday traffic is a critical component to ensure high quality recorded real data. In the beginning, the probability of sensor failures or false communication between actors leads to multiple broken scenes. Important steps learned:

- Knowledge of the immediate environment, traffic light- and traffic flow behavior.
- Usage of clear and short commands for communication
- Allow dynamic flexibility, do not insist completely on the script

The steep learning curve helped to plan and coordinate all following recording days and campaigns.

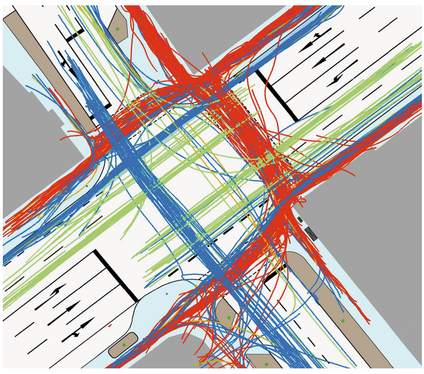

Fig.5: Illustration of all VRU trajectories recorded at the two KIDT measurement campaigns in Aschaffenburg. Different color illustrate different VRU subclasses.

Publications:

[1] M. Hetzel, H. Reichert, G. Reitberger, E. Fuchs, K. Doll and B. Sick, "The IMPTC Dataset: An Infrastructural Multi-Person Trajectory and Context Dataset," 2023 IEEE Intelligent Vehicles Symposium (IV), Anchorage, AK, USA, 2023, pp. 1-7
[2] M. Hetzel, H. Reichert, K. Doll and B. Sick, "Smart Infrastructure: A Research Junction," 2021 IEEE International Smart Cities Conference (ISC2), Manchester, United Kingdom, 2021, pp. 1-4

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IMPTC Trajectory Dataset
github.com/kav-institute/imptc-dataset

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