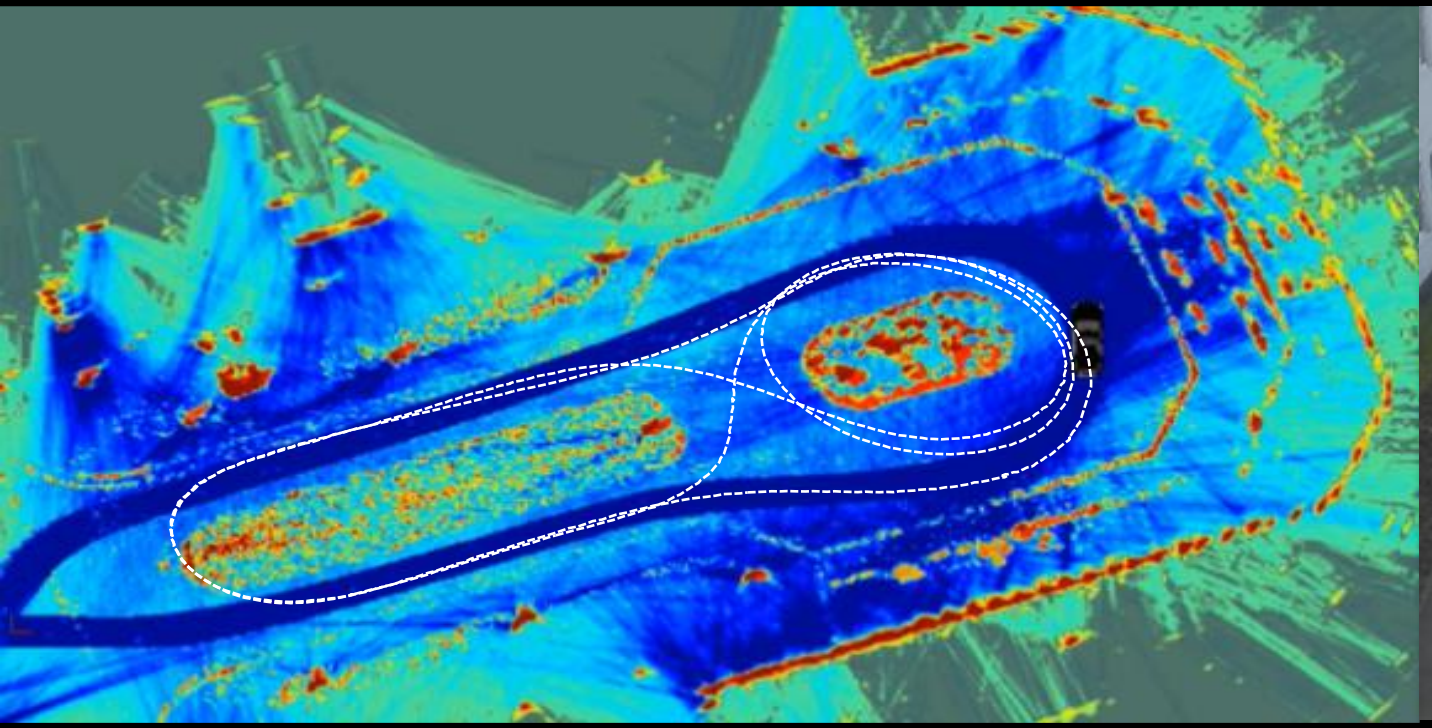


SLAM technologies for parking applications part II: A showcase AdaptIVe

AdaptIVe
Automated Driving

Dr. Markus Hahn

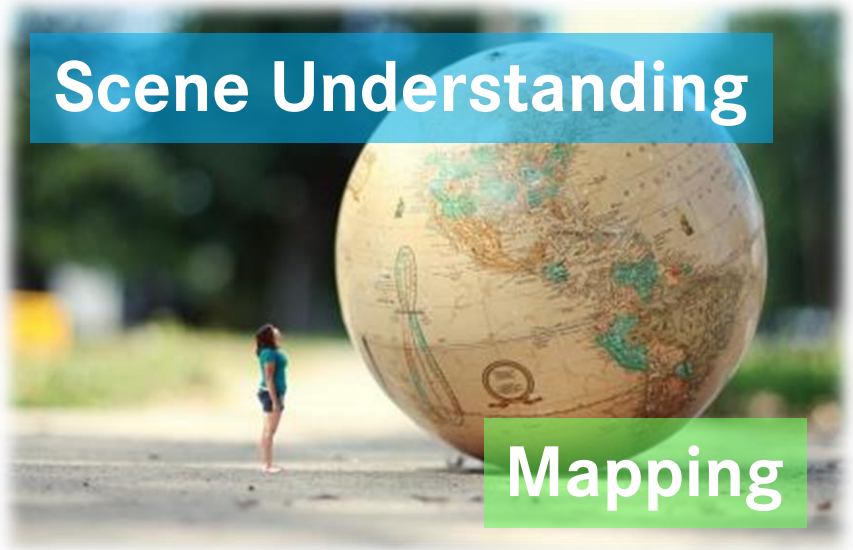
Principal Engineer, Daimler AG

Mercedes-Benz
The best or nothing.

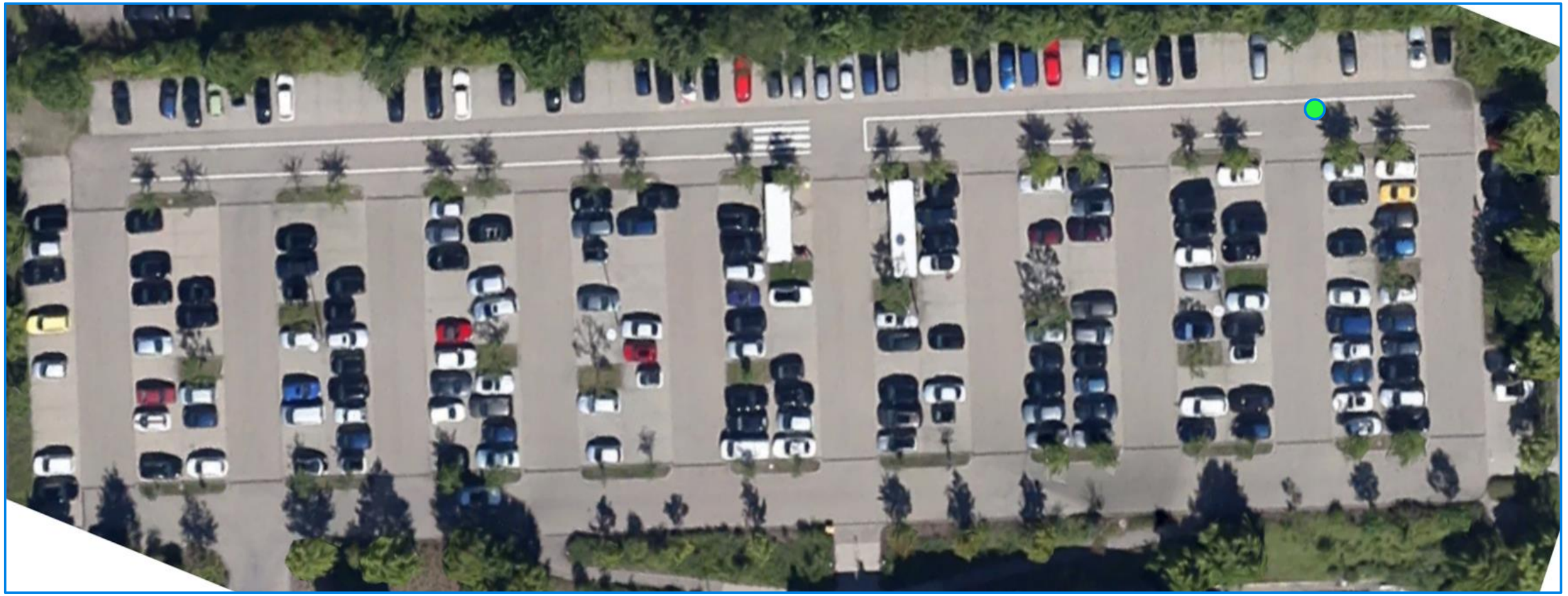
Demonstrator and Sensors

Approaches

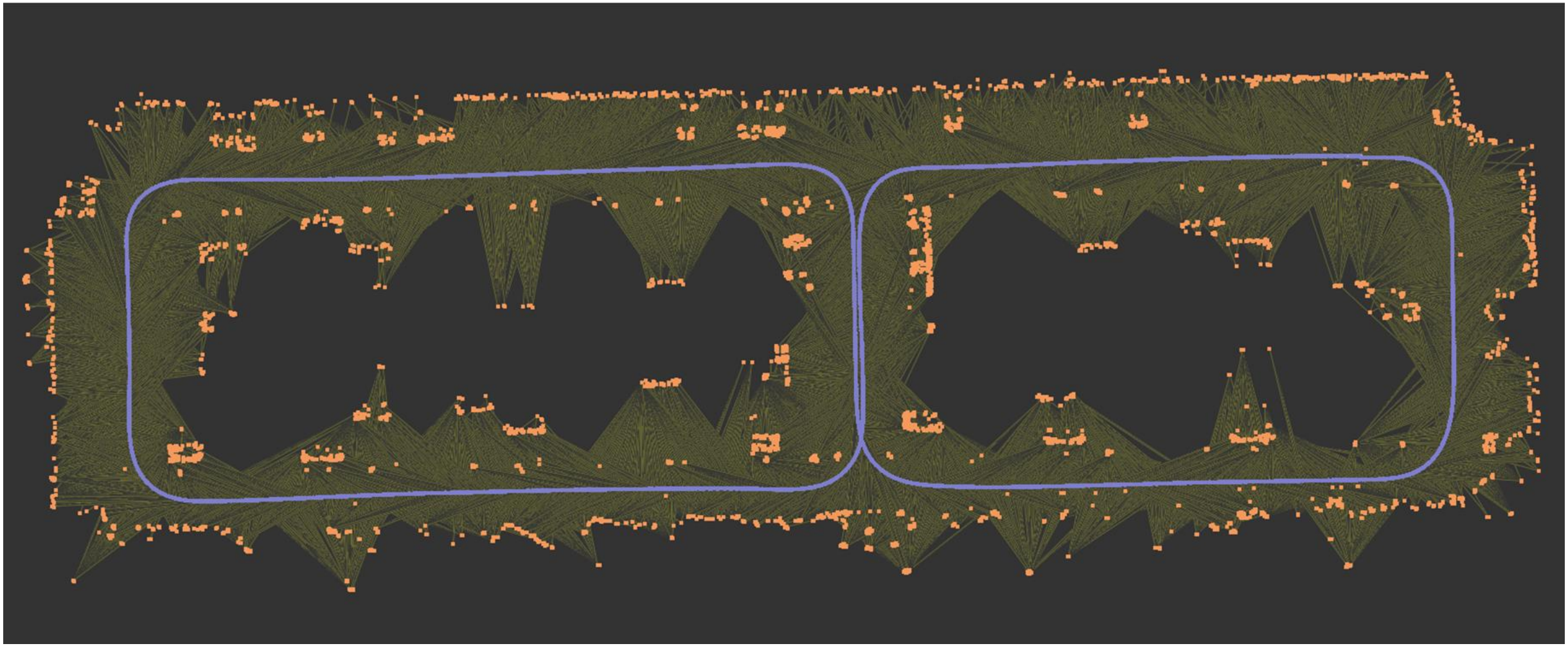
- Mapping based on dead reckoning
- Mapping based on dead reckoning + radar odometry
- Scan matching
- Scan matching + radar odometry
- EKF SLAM
- Fast-SLAM
- Grid-based SLAM
- Graph-SLAM



Approaches



Approaches



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Teaching an Environment

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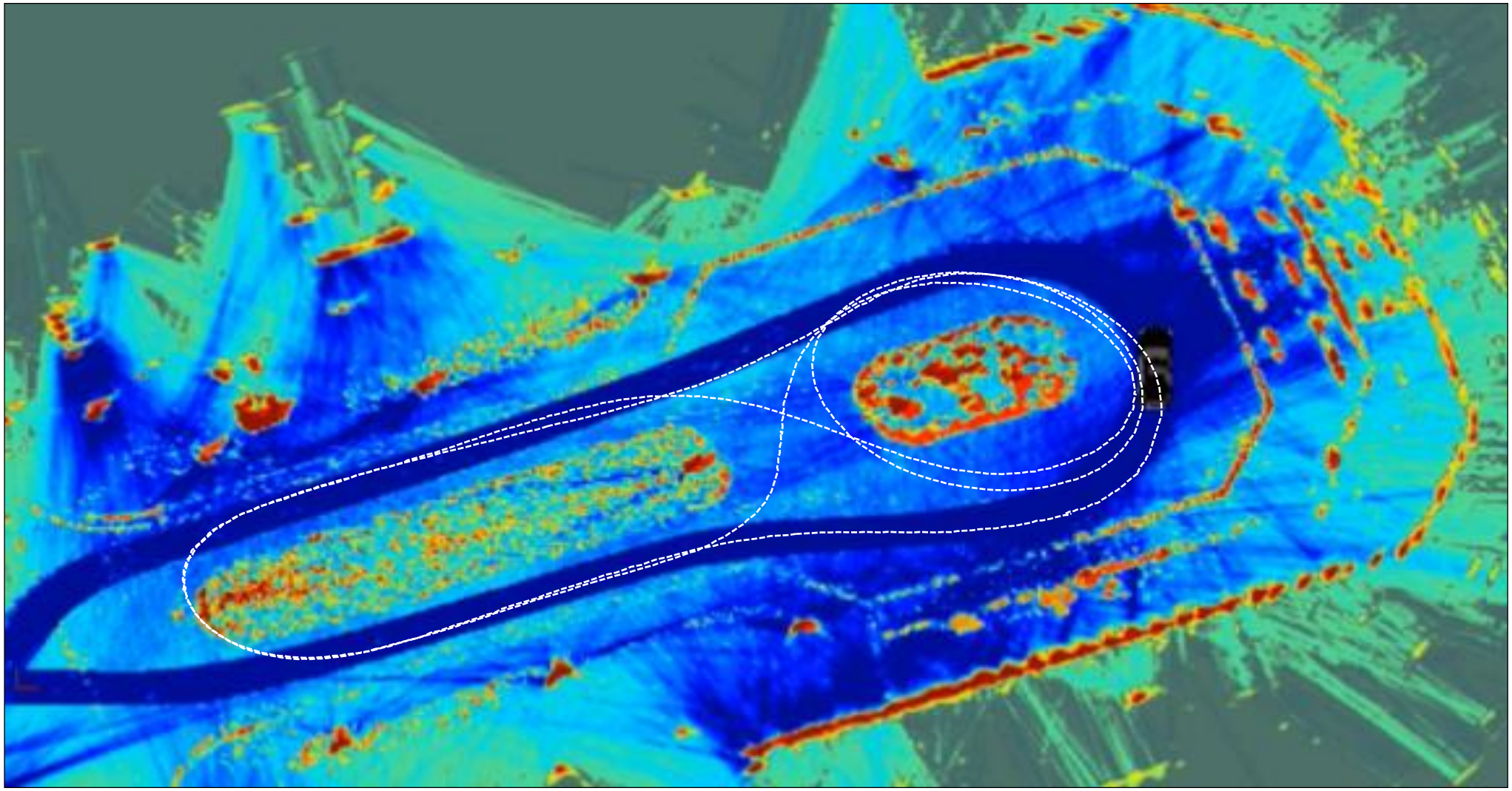
Radar grid of Environment



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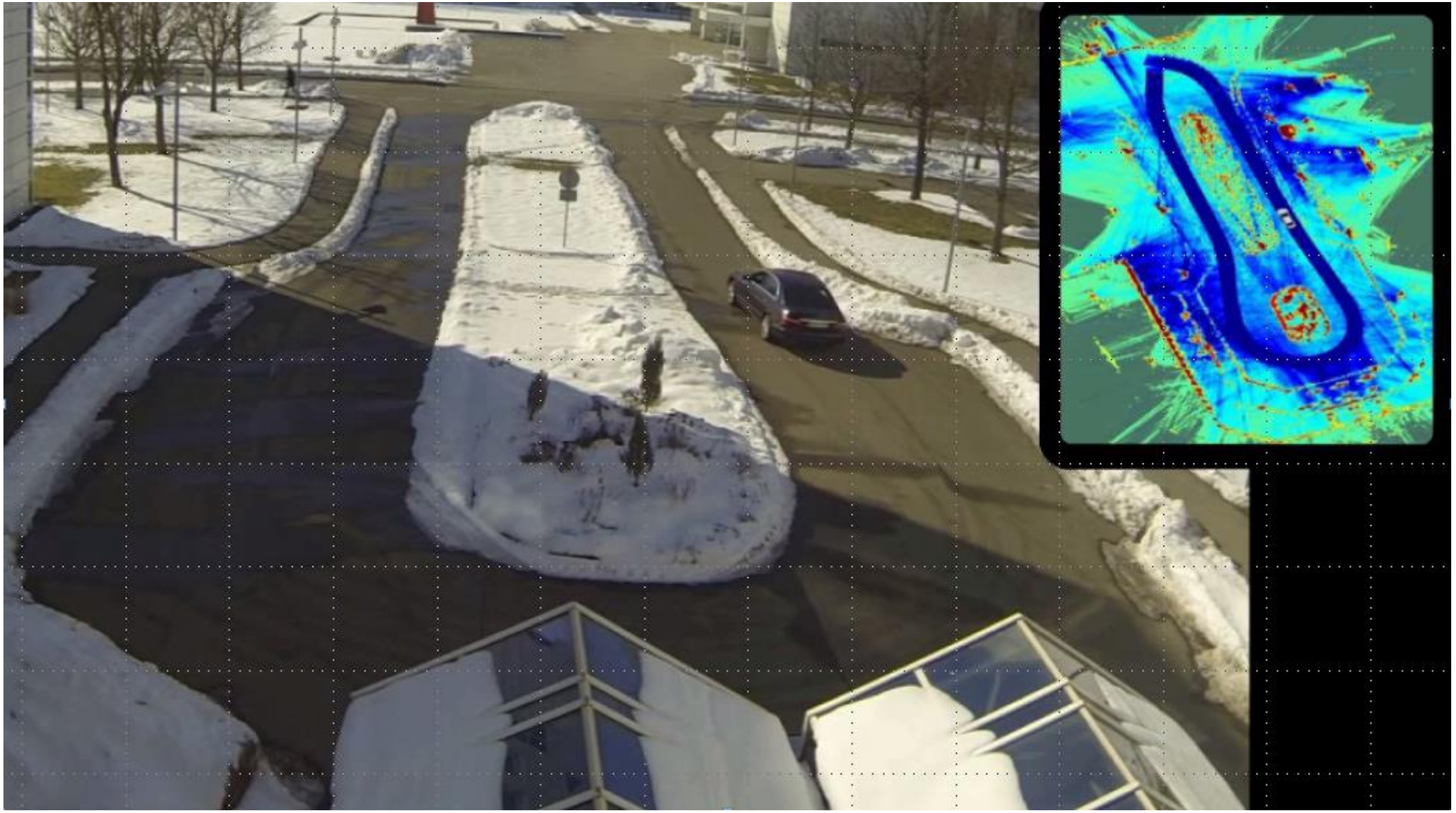
Localisation



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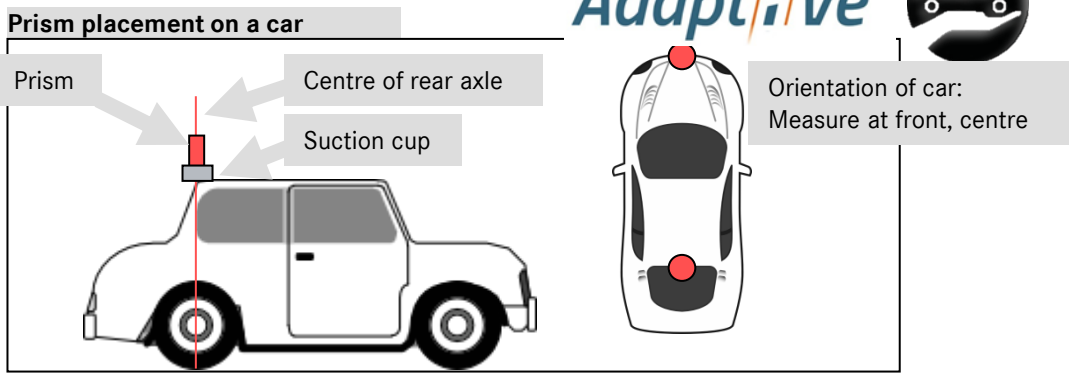
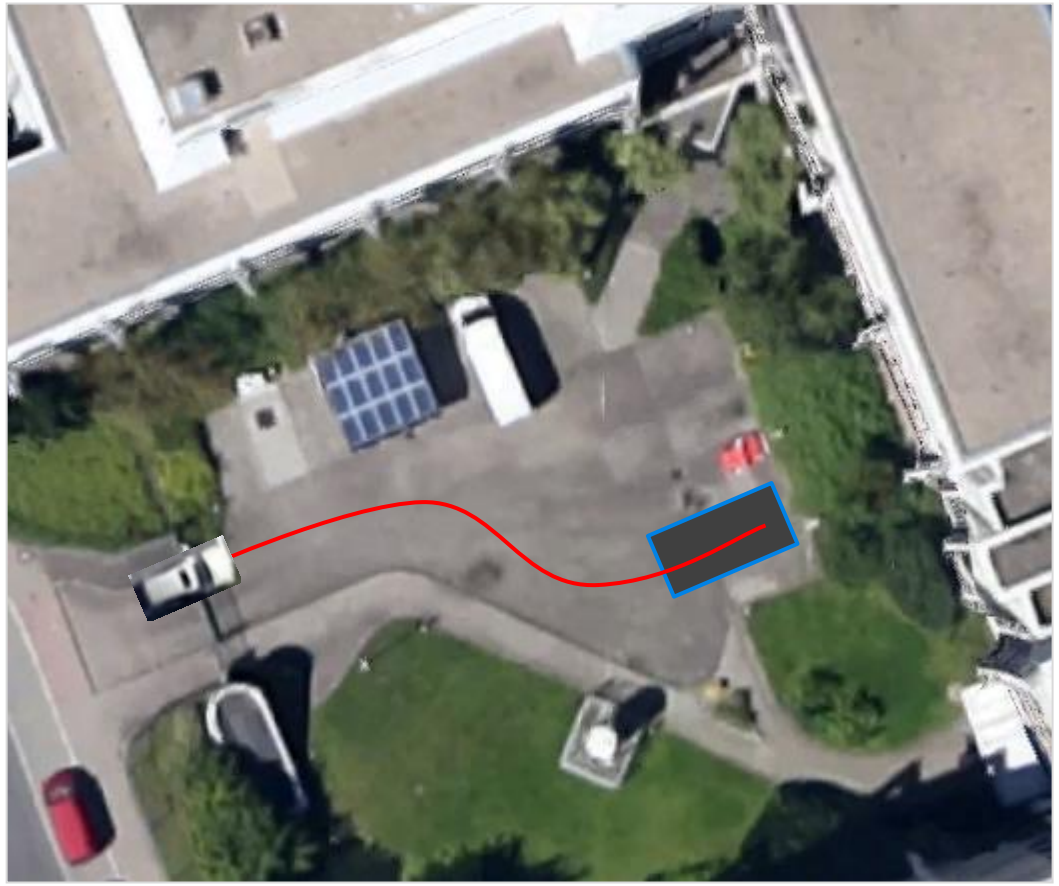
Evaluation of Localisation



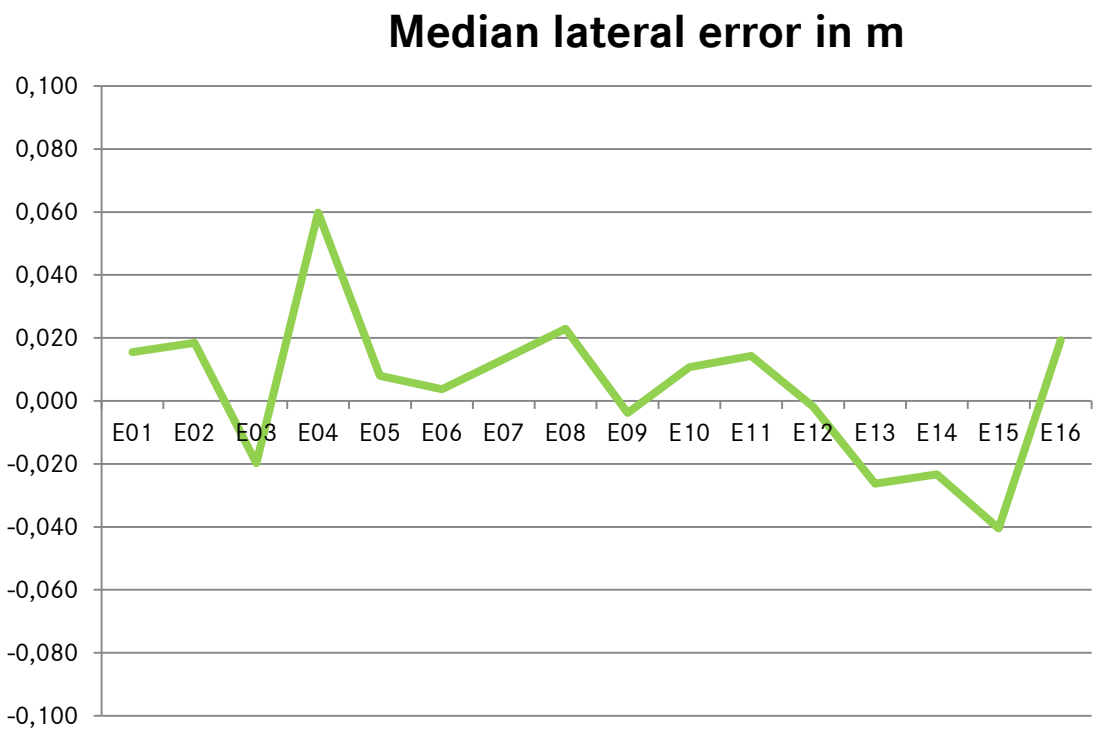
- Tachymeter Leica MS50 as ground truth system
- Prisms are placed on car
- 16 environment sets
- 5 trajectories per environment set
- Environment set was changed during the drives:
  - Parked cars
  - Pedestrians
  - Garbage cans

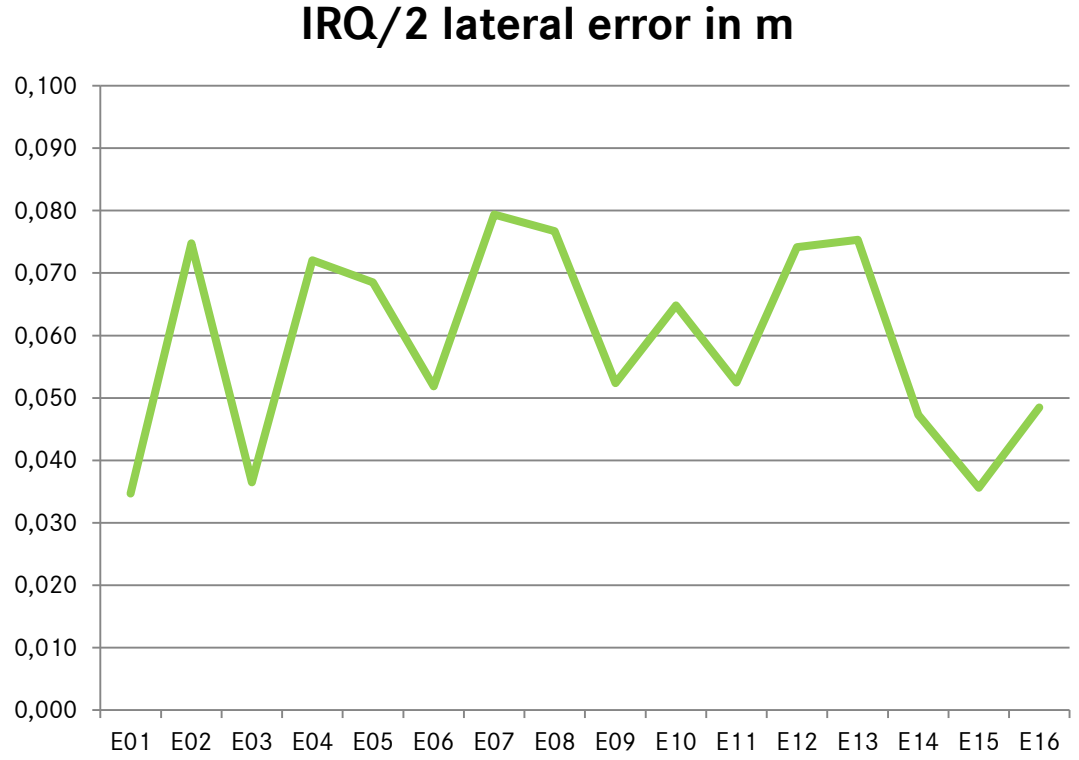
- Cross validation with all trajectories of environment set



Localisation: Current Results

Error in lateral direction along whole trajectory, around 400 drives

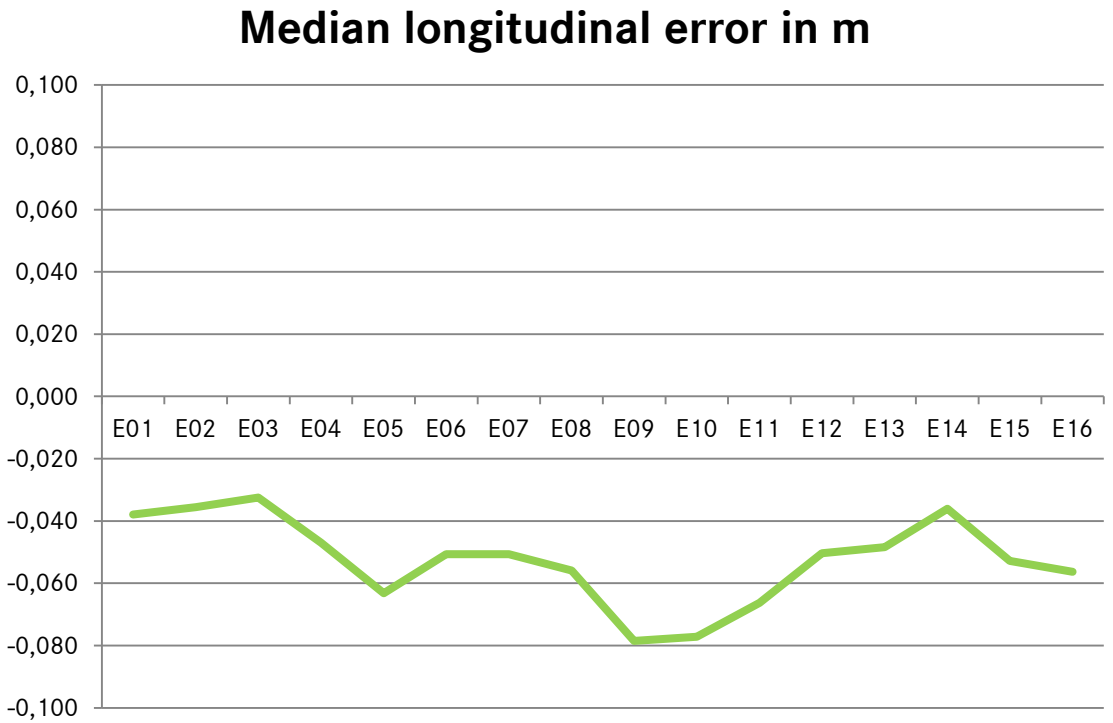


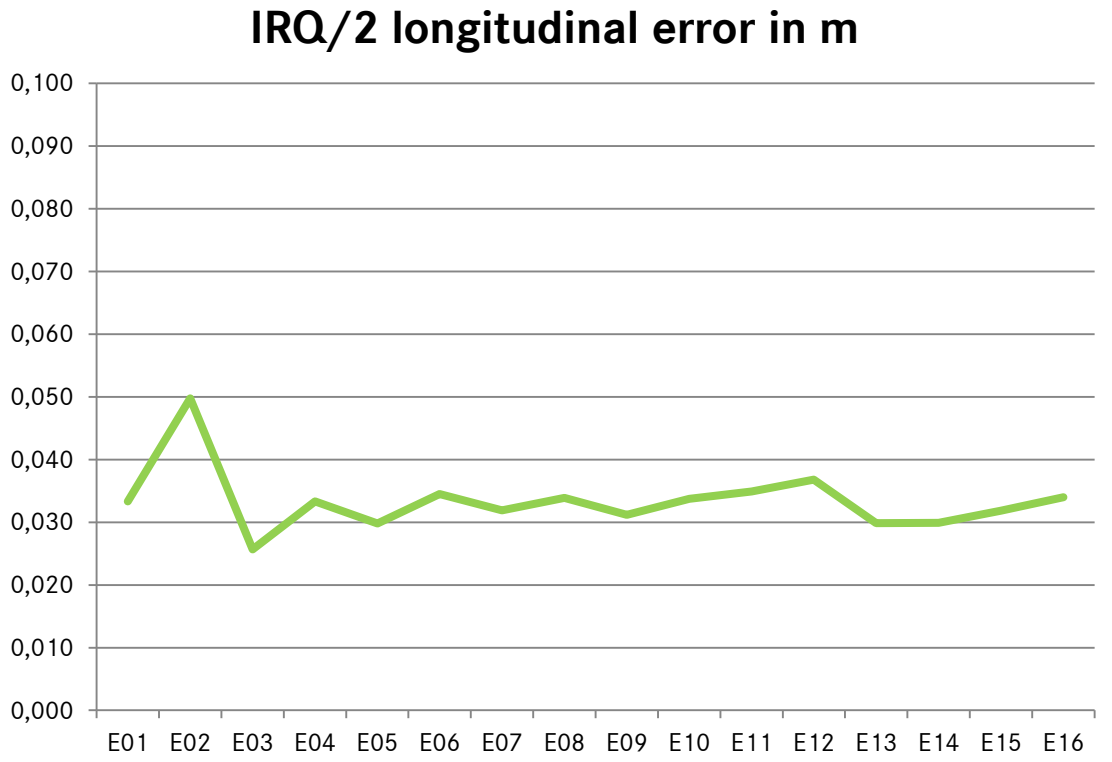


IQR → interquartile range, measure of statistical dispersion, being equal to the difference between the upper and lower quartiles

Localisation: Current Results

Error in longitudinal direction along whole trajectory





IQR → interquartile range, measure of statistical dispersion, being equal to the difference between the upper and lower quartiles

Automated Driving in a Taught Environment

Mercedes-Benz

Automated Driving in a Taught Environment

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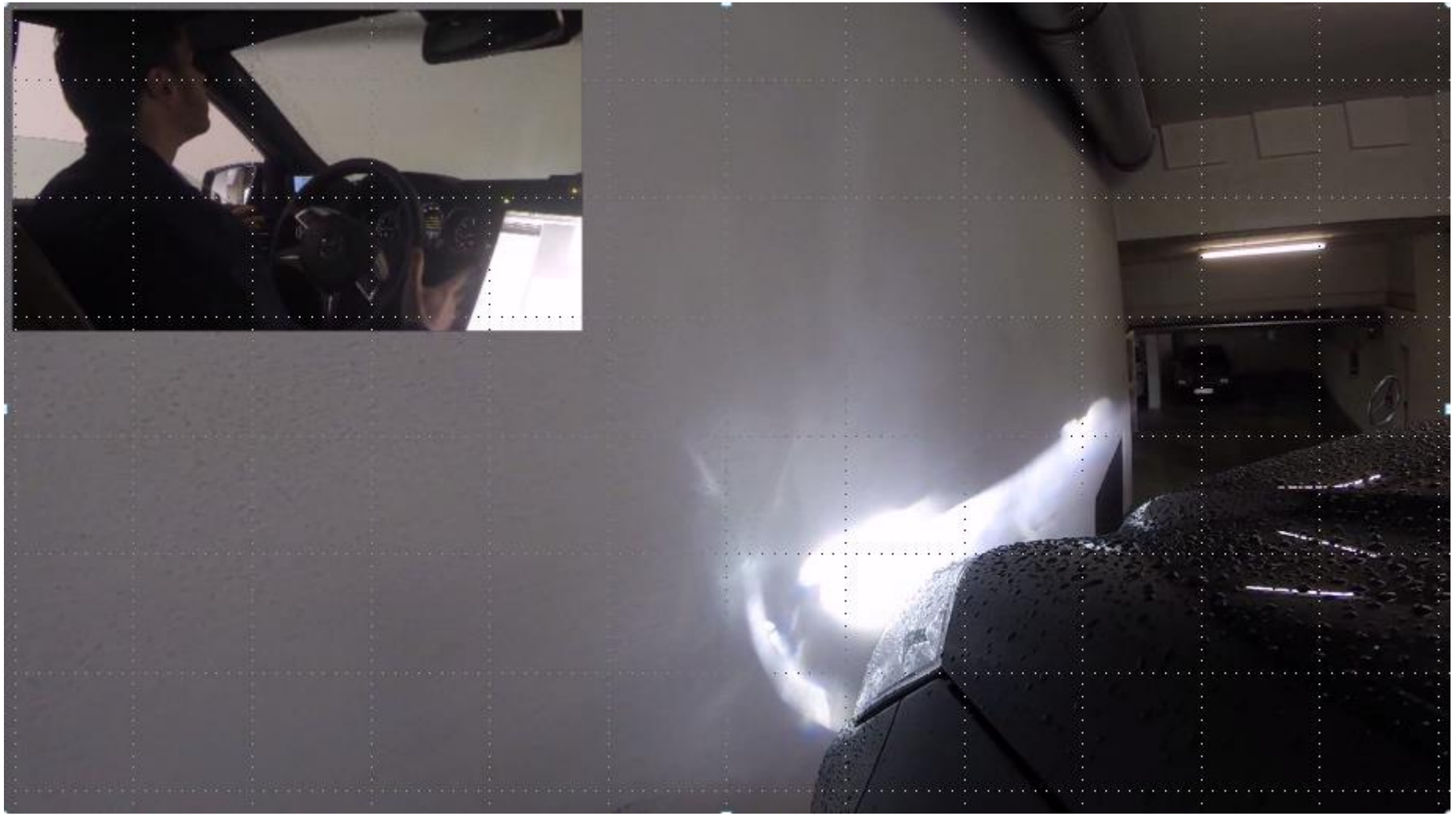
Automated Driving in a Taught Environment



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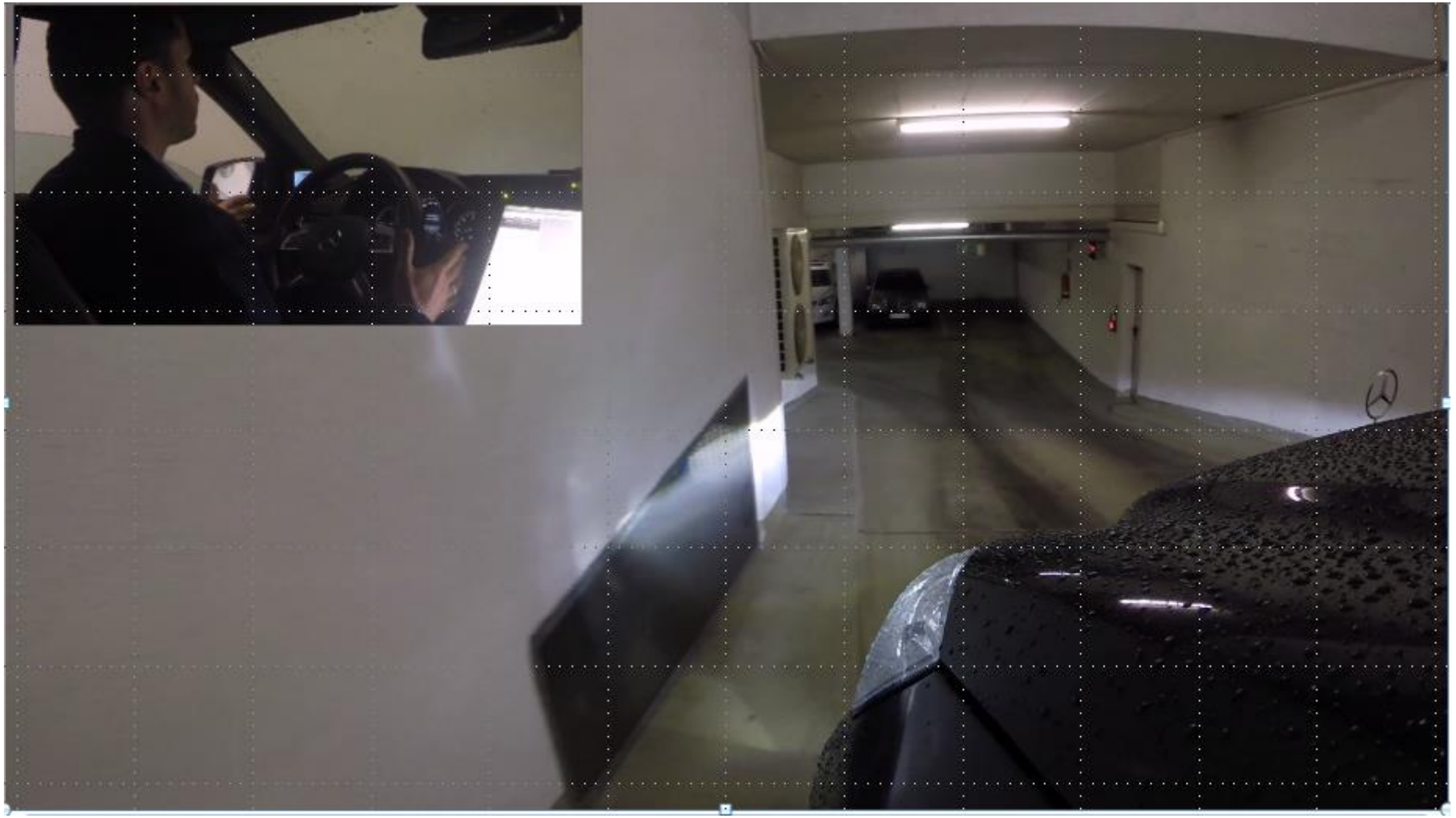
Automated Driving in a Taught Environment



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CRISTALS
Thx...