

# DAIMLER



## Adapt*://*Ve

*Automated Driving Applications and  
Technologies for Intelligent Vehicles*

## *Classification and Localisation in Parking Scenarios*

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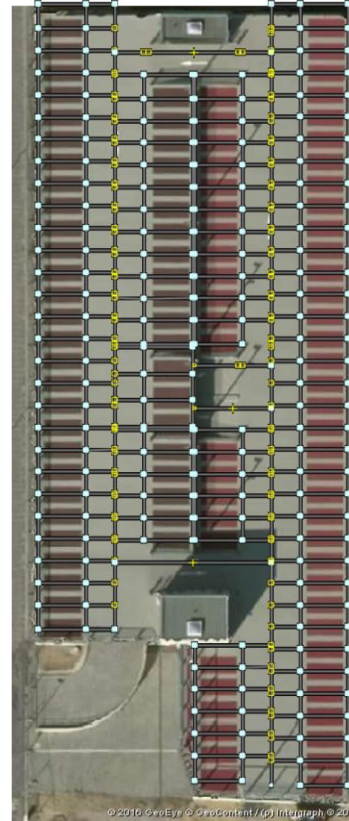


# // Daimler Focus for Automated Parking



## Trajectory Learning:

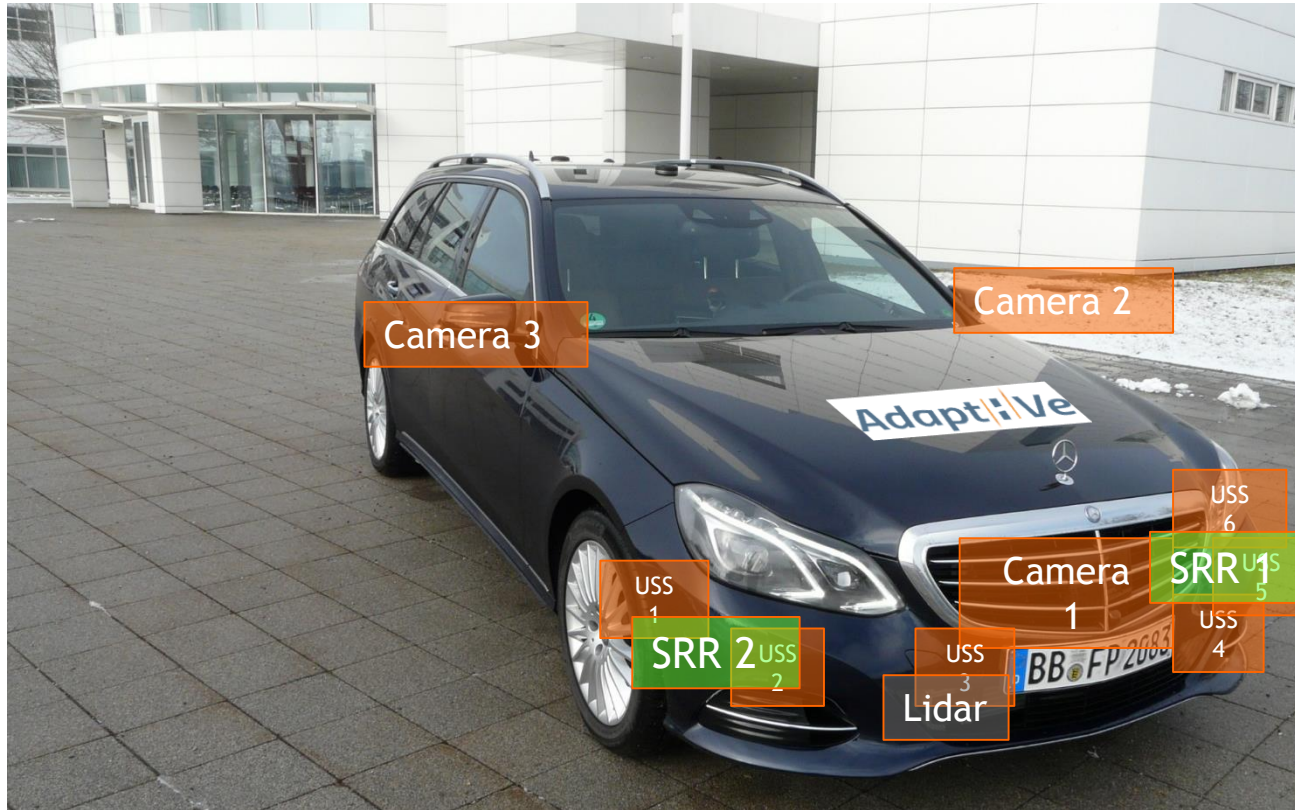
- Teach a trajectory to the car
- At least one teach drive
- Car builds its own map using onboard sensors
- After teaching, the car should be able to follow the trajectory on its own
- SLAM is useful
- Car needs to solve kidnapped robot
- Level 3 automation



## Automated Parking Garage Pilot (APGP):

- Map is given from parking garage operating company
- Map is in OSM format
- Mapping sensors are different from sensors in car
- Car needs to validate map
- No need for SLAM, but could be useful
- Car needs to solve kidnapped robot
- Level 3 automation

# // Demonstrator and Sensors



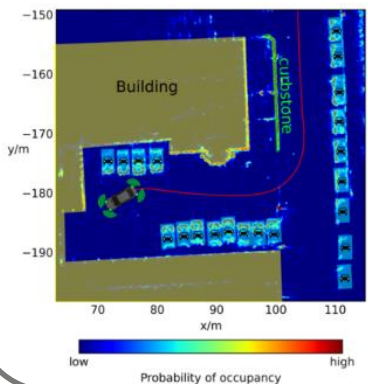
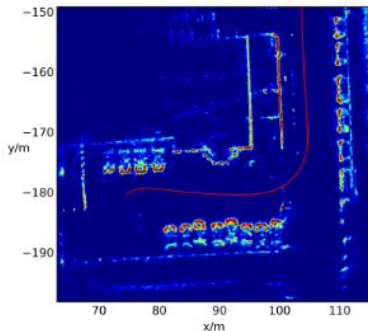
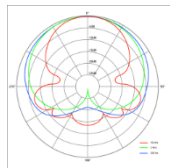


# // Radar Classification

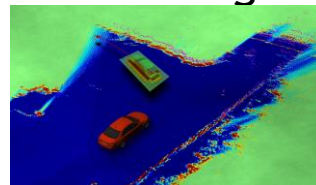
Adapted Sensing



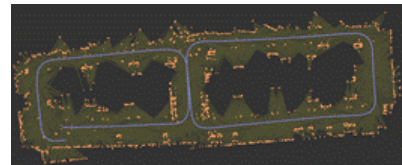
Cognitive Sensing



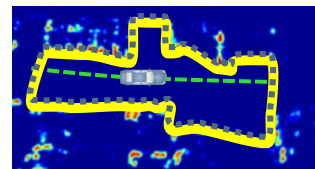
Tracking



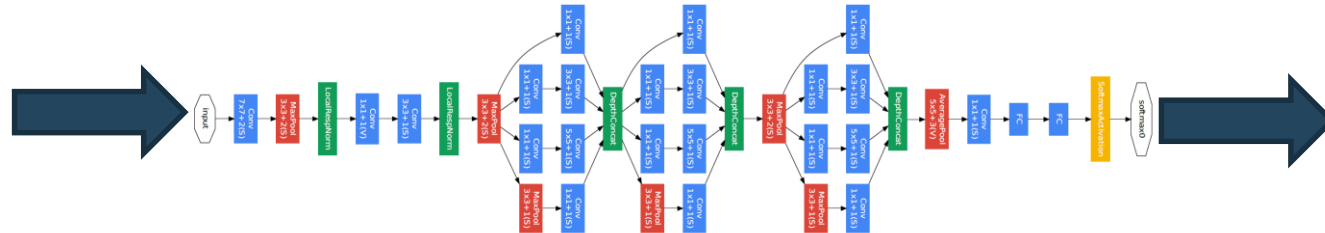
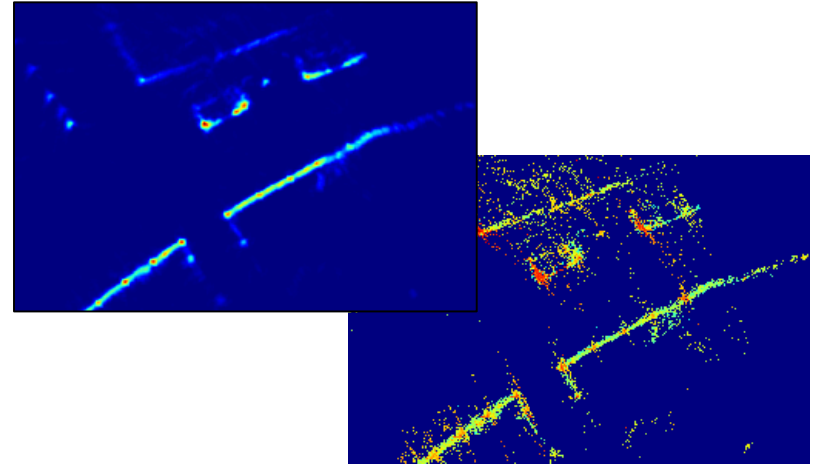
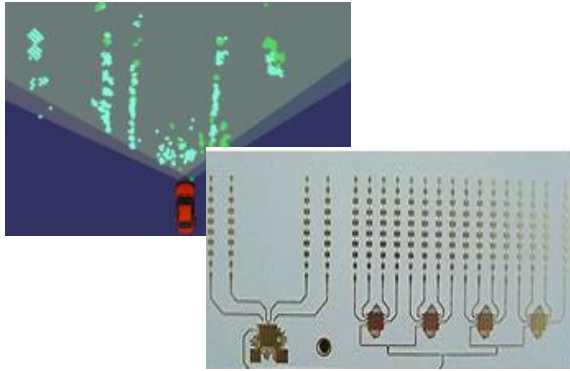
Localization



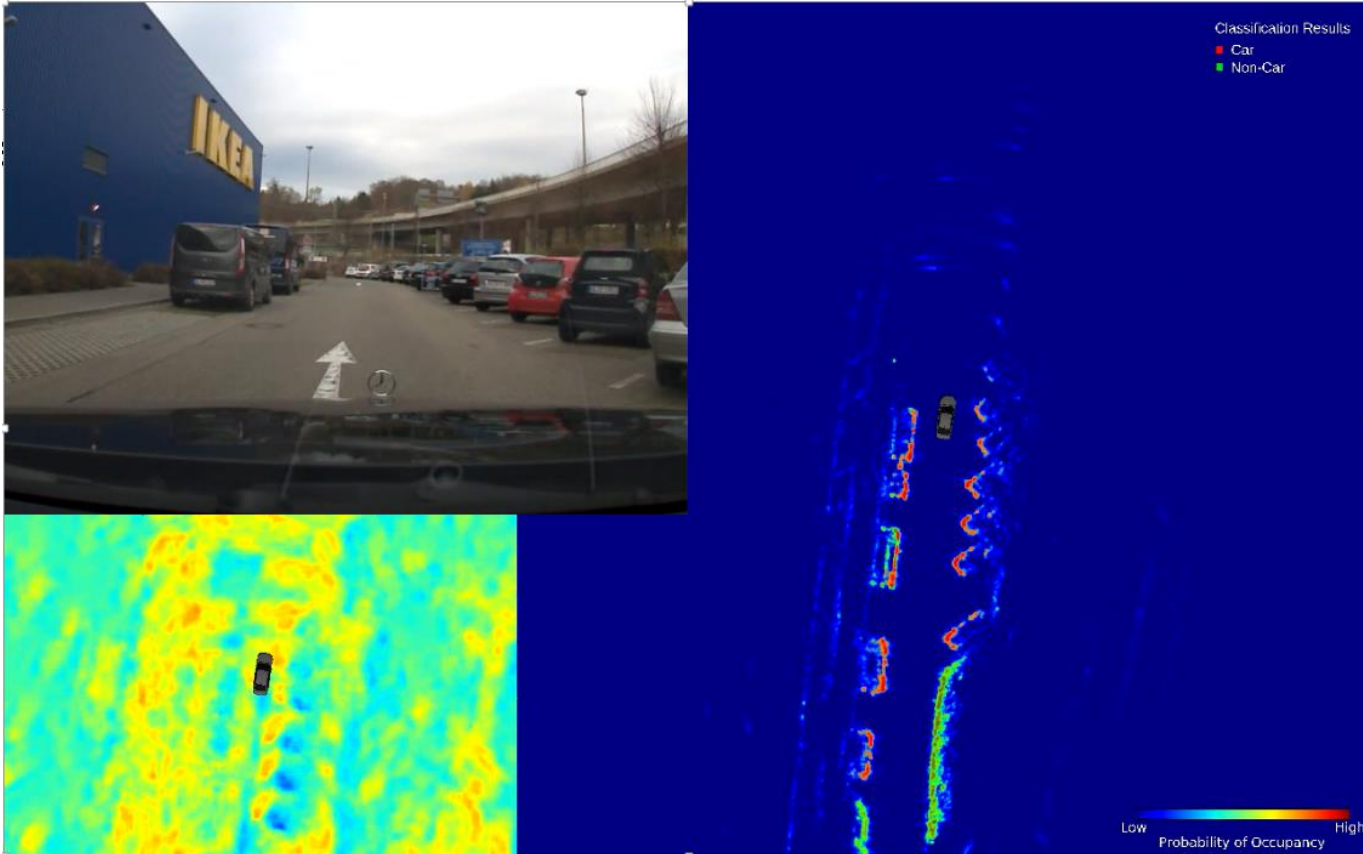
Path Planning



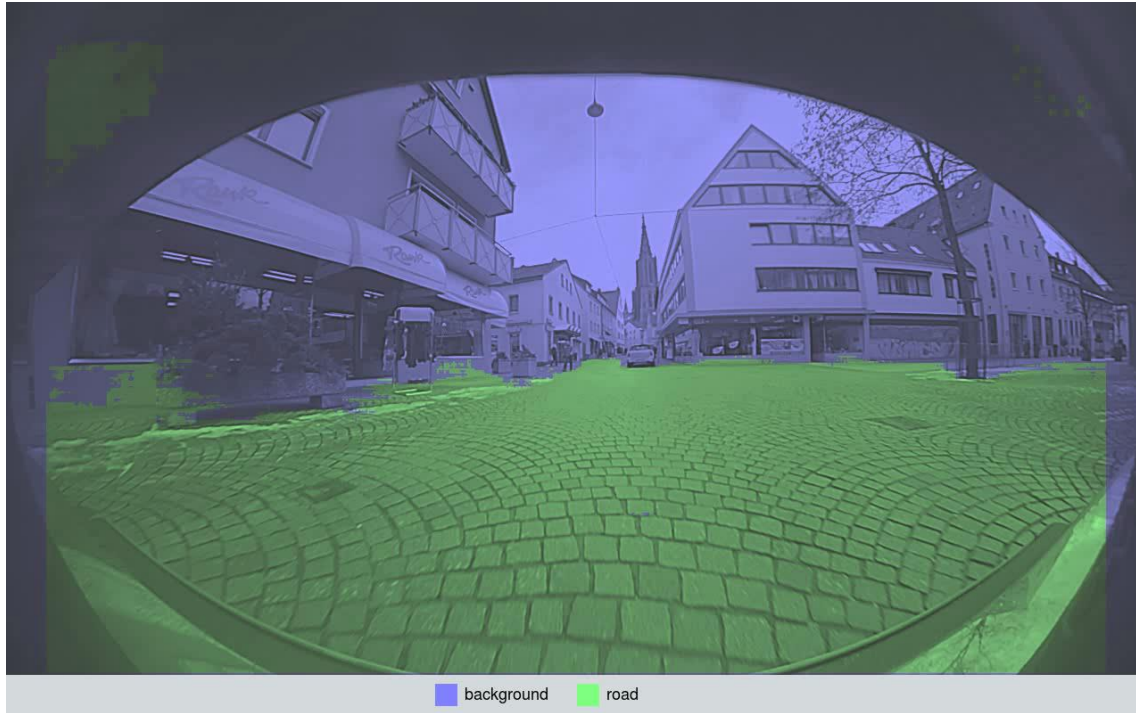
# // Radar Classification



# // Radar Classification



# // Image Classification Surround View Cameras



# // SLAM technologies for parking applications

...Grid-Maps, Landmarks, Semantic-Grids and Localization

# Challenges



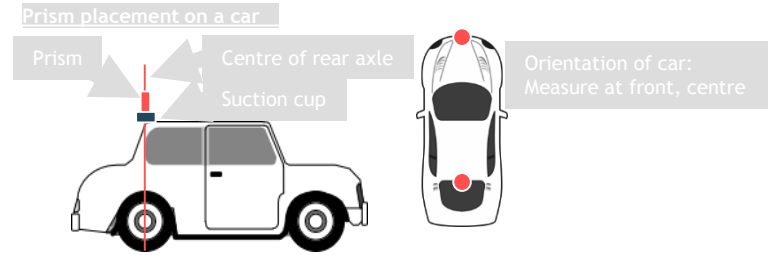


# // Teaching an Environment



# // Evalutaion 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



### Median lateral error in m



### IRQ/2 lateral error in m



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

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# // Final Video



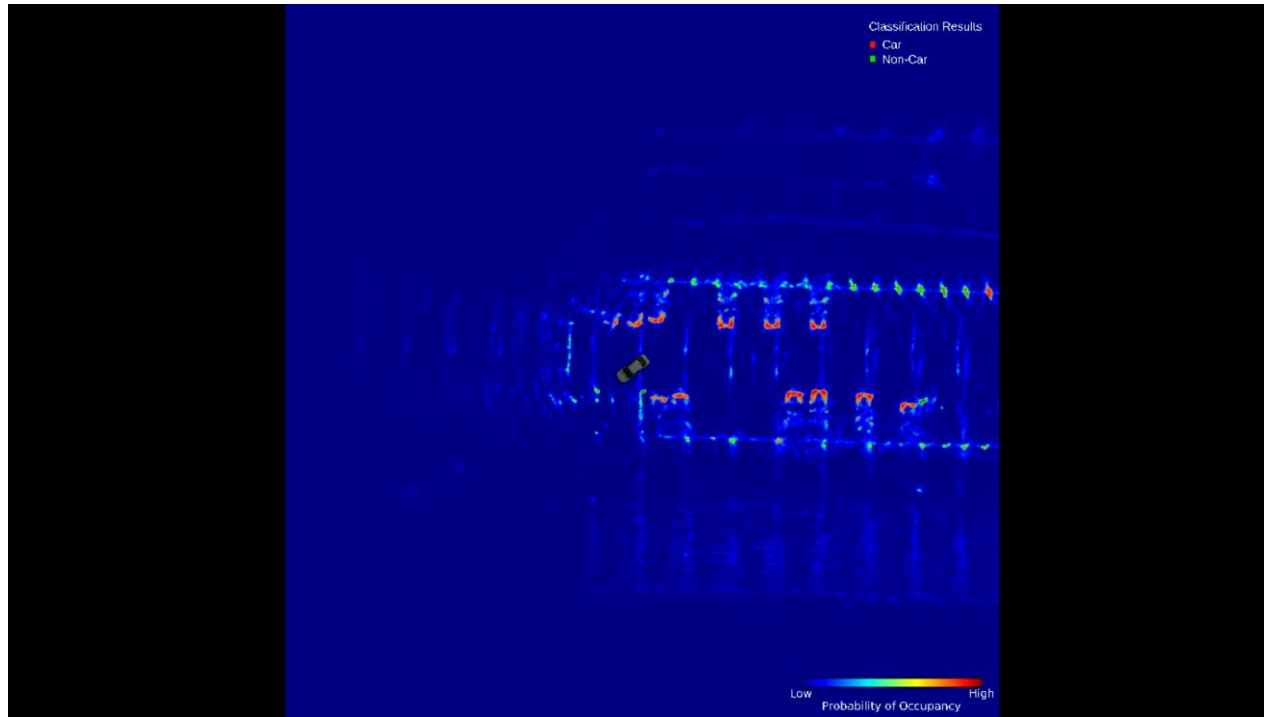
## // Final Video



## // Final Video

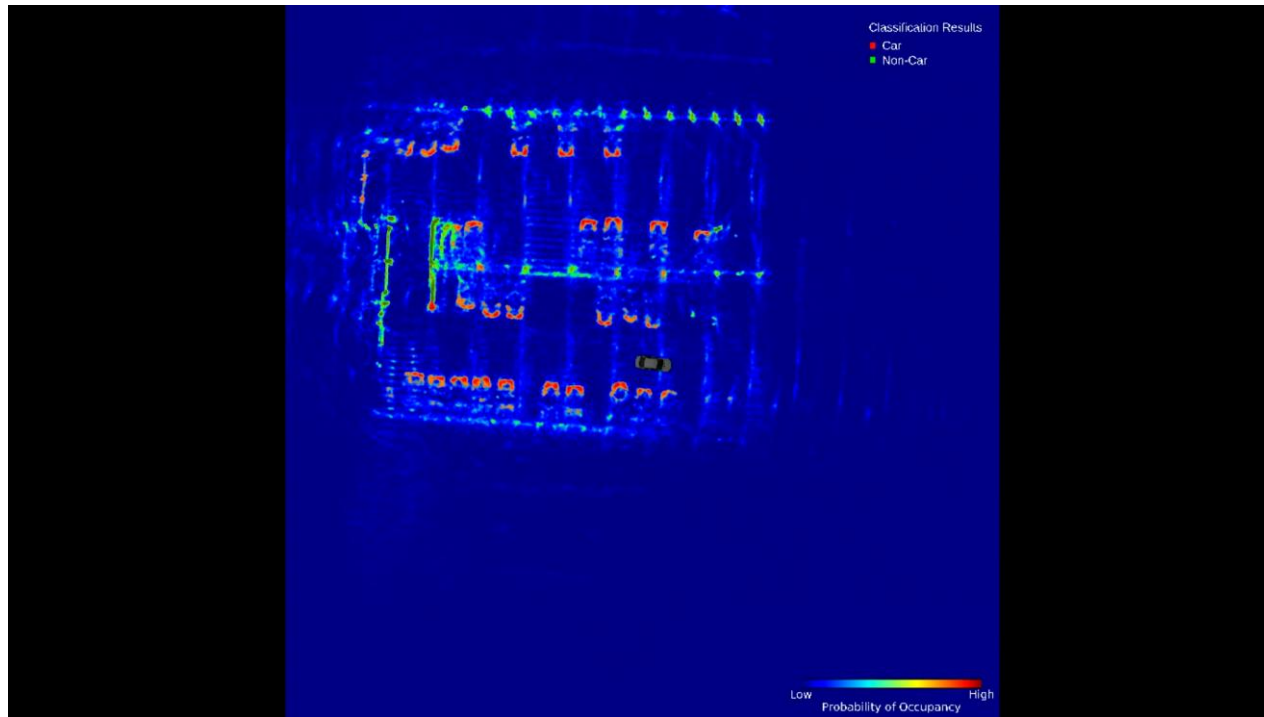


# // Final Video





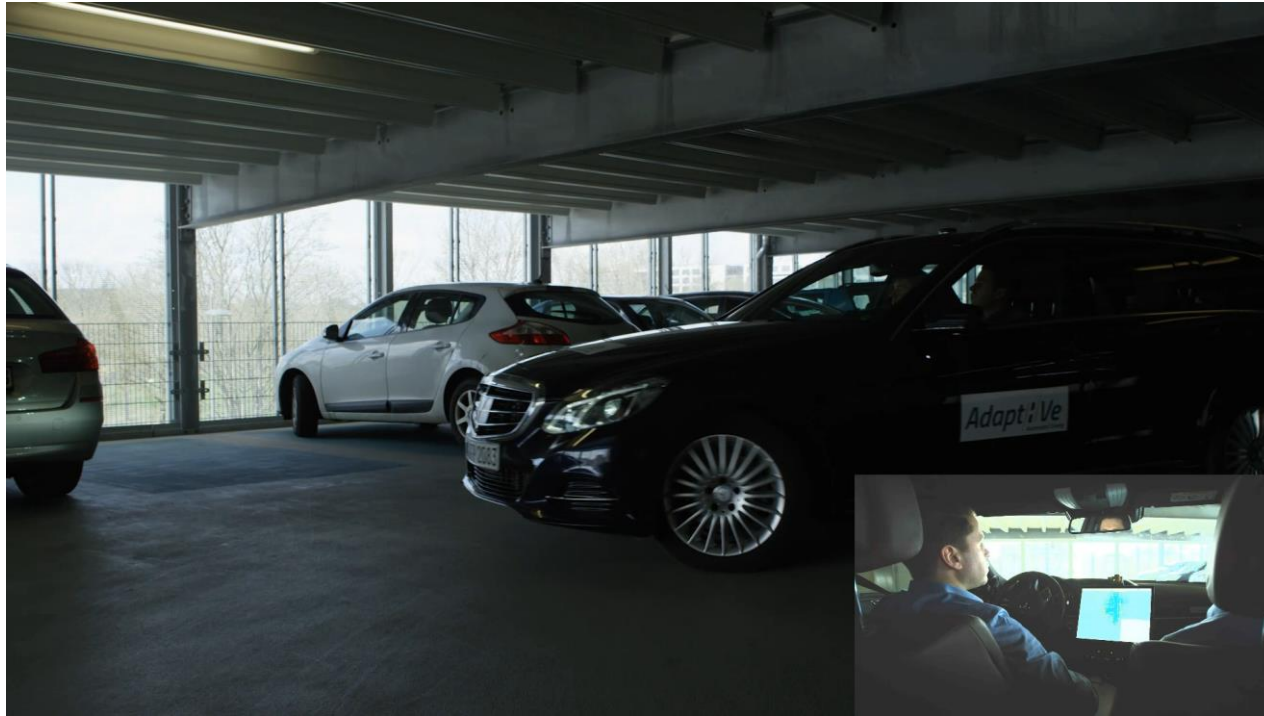
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## // Final Video







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# *Adapt//Ve*

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*Thank you.*

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