

EPIC Meeting on FMCW LiDAR Systems

Laser World of Photonics 2022

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Teamlead Hardware Systems, Munich | 29. April 2022

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1. Who we are
2. What we do
3. Community

1. About LiangDao GmbH



German-Chinese start-up
founded 2018 in Munich



60+ Employees



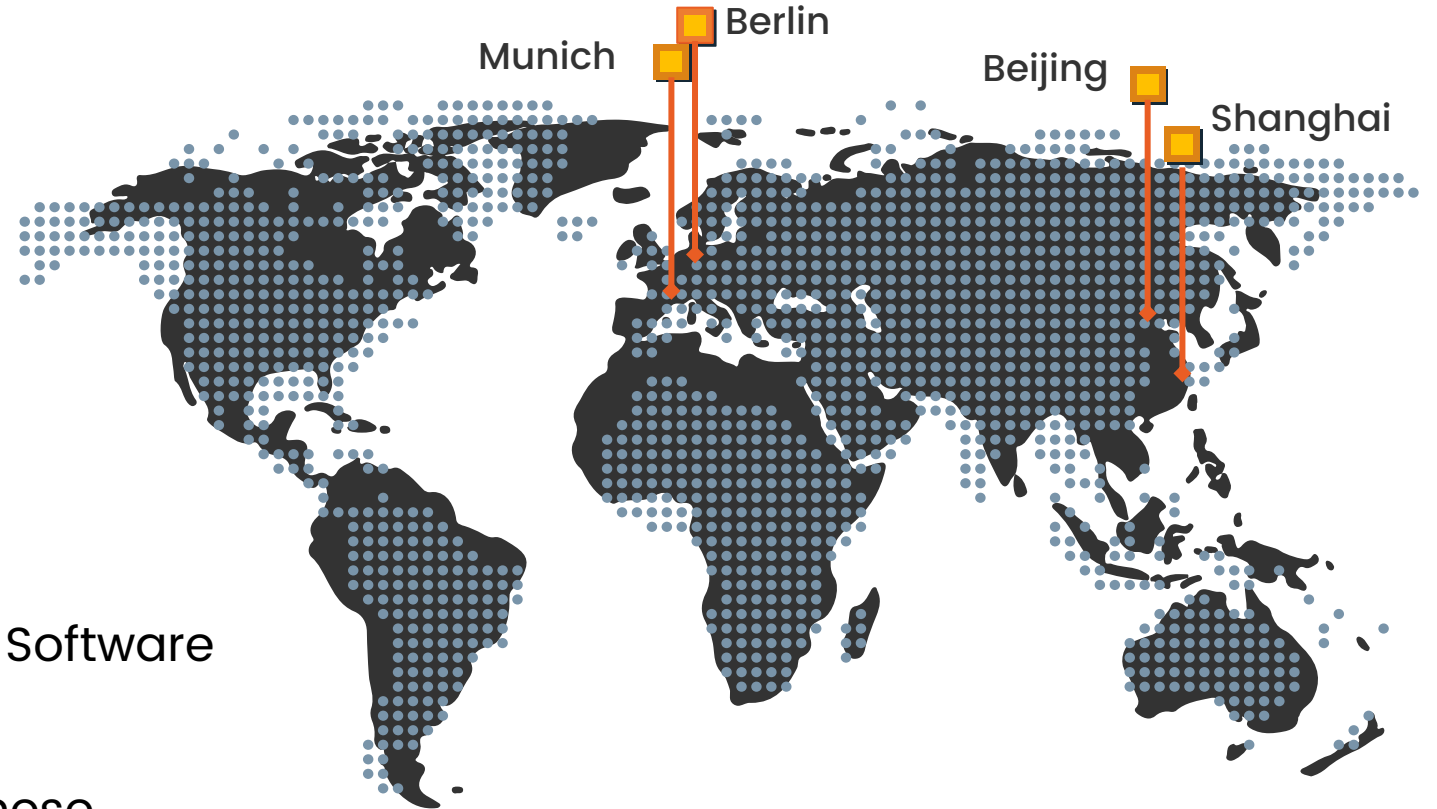
Hardware independent LiDAR
Sensor System provider



Core know-how in AI perception Software



Partnerships with German & Chinese
OEMs, Tier 1 suppliers and municipals



1. Smart mobility requires reliable sensor data



Autonomous Driving



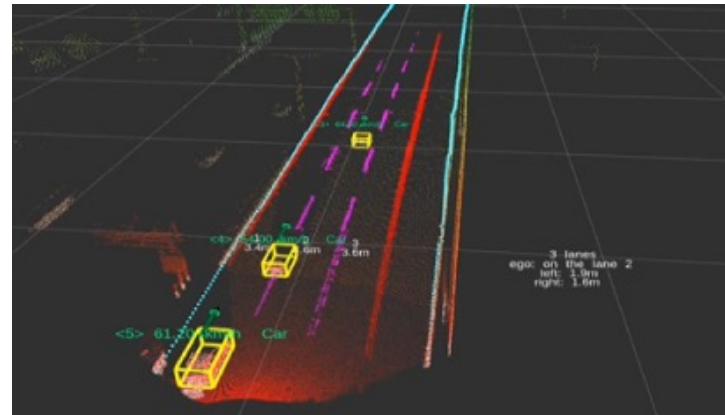
Urban Mobility



Road Safety



Commercial Vehicles

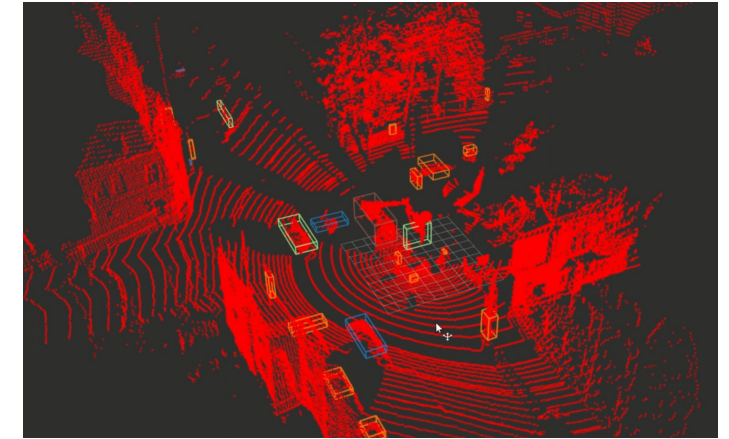
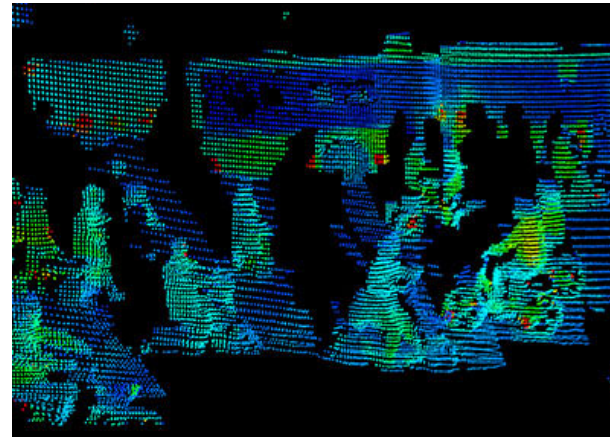
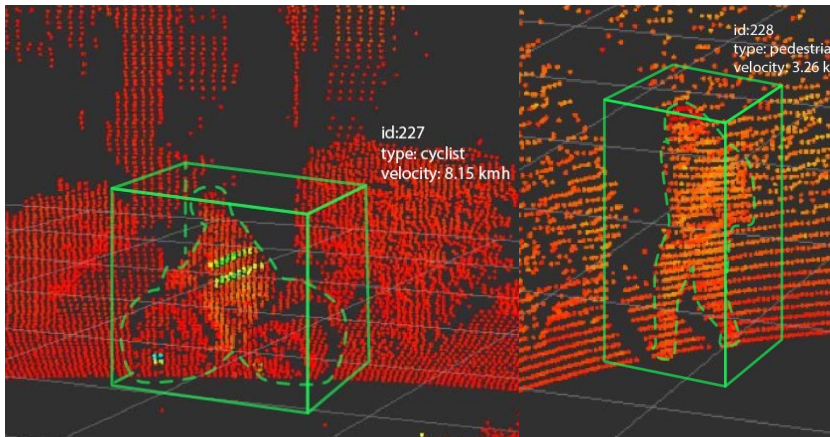


Vehicle to everything (V2X)



Smart Infrastructure

1. LiDAR as a better data source for future mobility



Realtime capabilities

Detection of **single person** / person groups

Static object detection

ID / speed / size / trajectory of **dynamic objects**

3D high resolution near & far (up to 140m)

All weather and light conditions

High reflection intensity

Data **privacy compliant** (DSGVO)

1. Each use case requires different sensor systems

- Resolution
- Design
- Reliability
- Price
- Performance
- Range

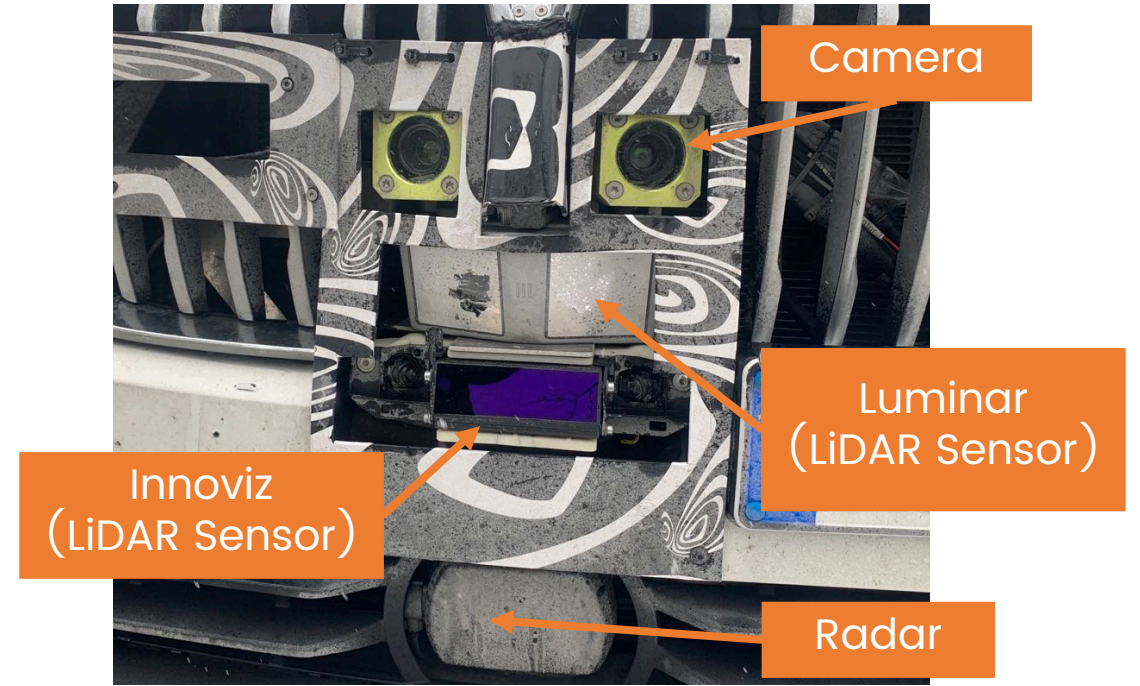
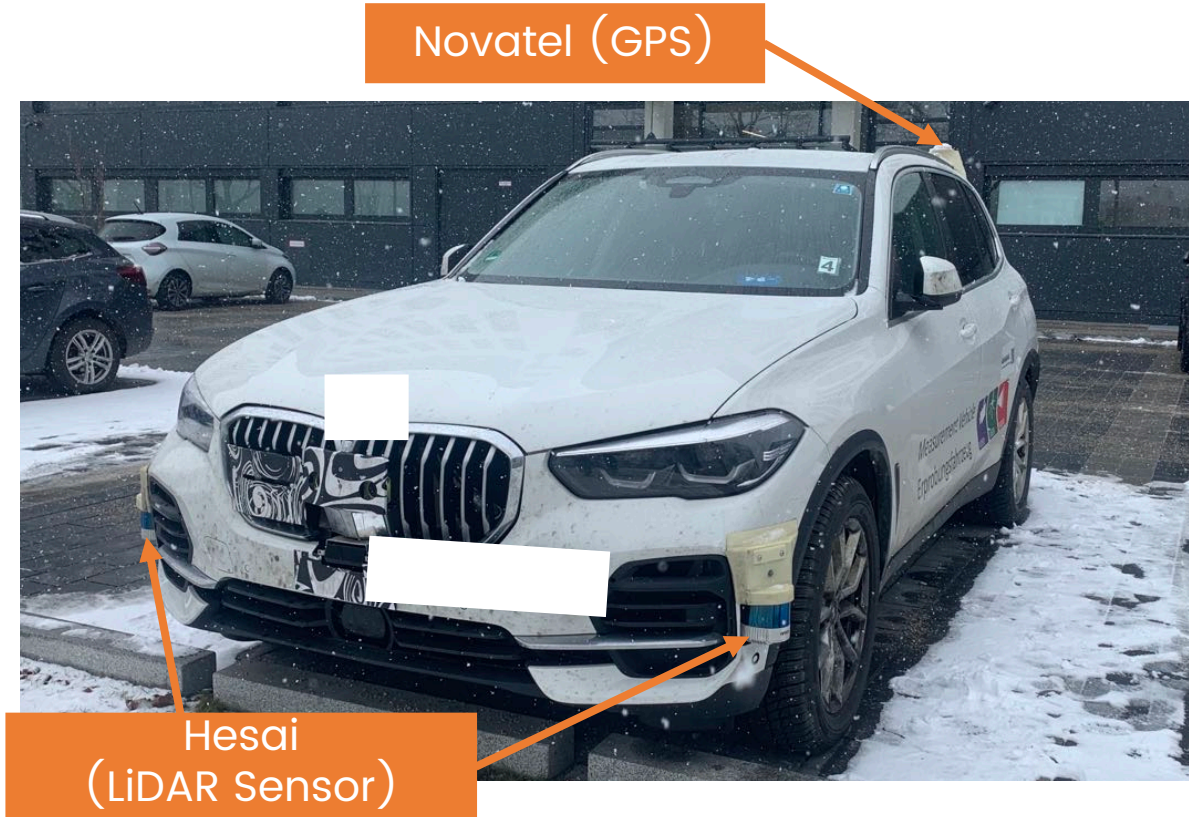


Sensor Hardware	Edge Computing Unit	We build high-performing data protection compliant sensor system solutions
Perception Software		

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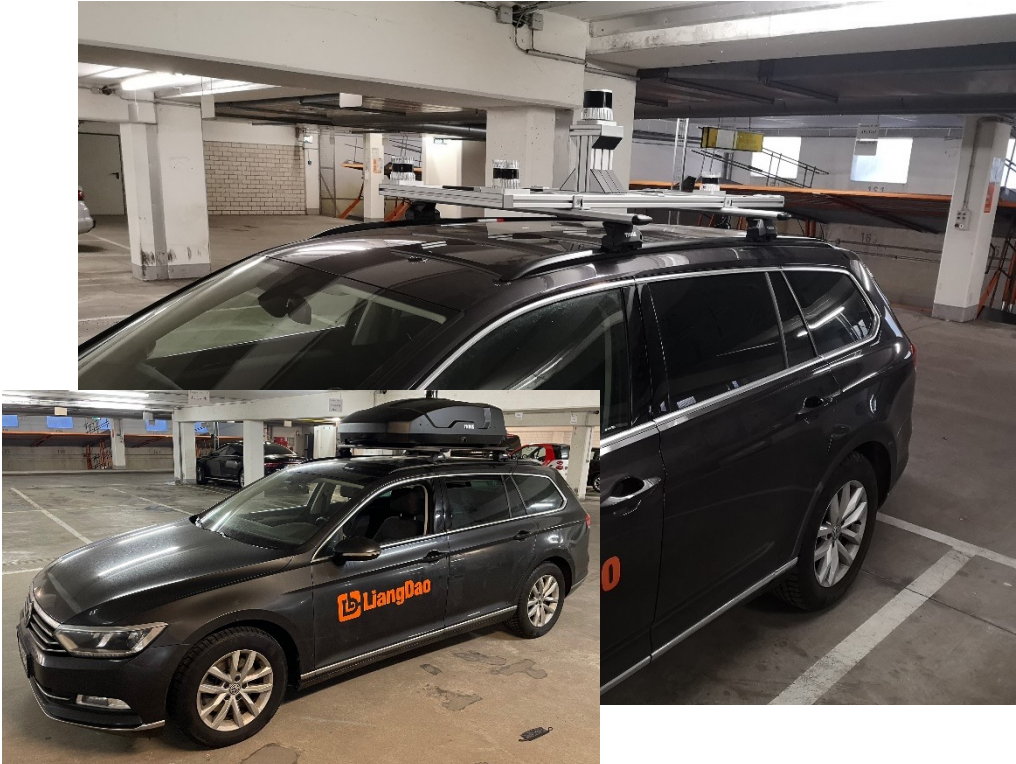
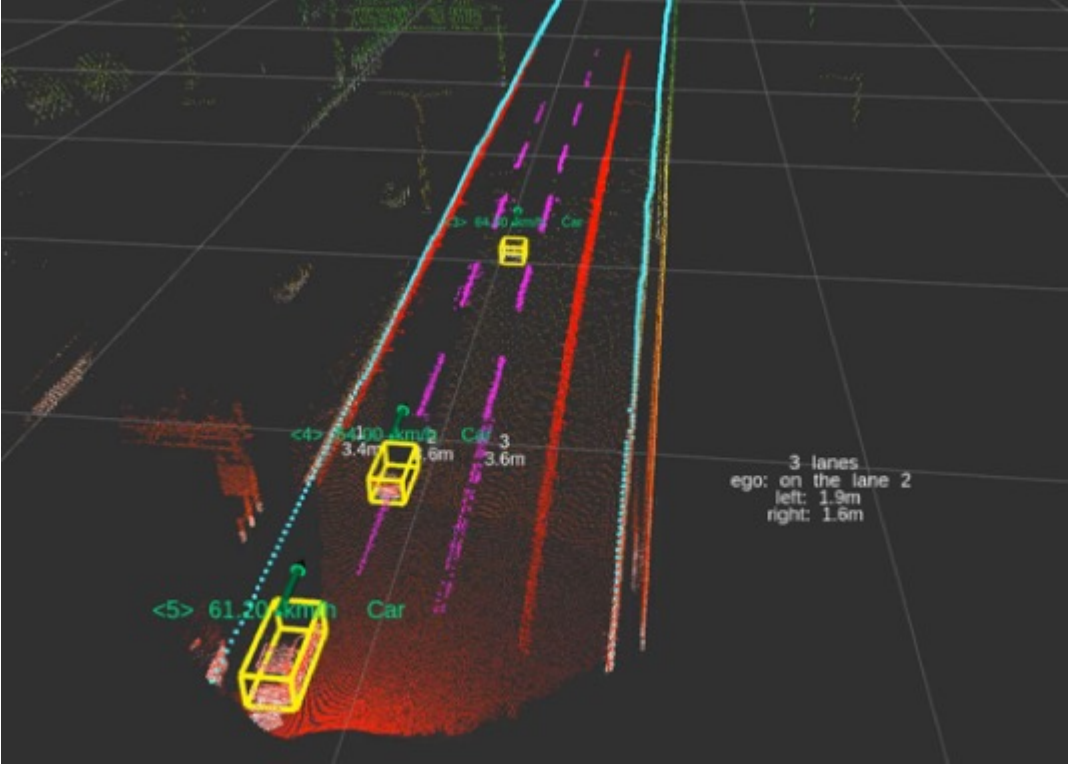
1. Who we are
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2. Test vehicle equipped with sensors for sensing the world



LiangDao Software enables the **automotive** industry to use best in class **multi sensor setups** for **autonomous, advanced driving** and **assistant systems**

2. Reference system to provide accurate ground truth data



LiangDao **Compass reference system** for **ground truth** test and validation

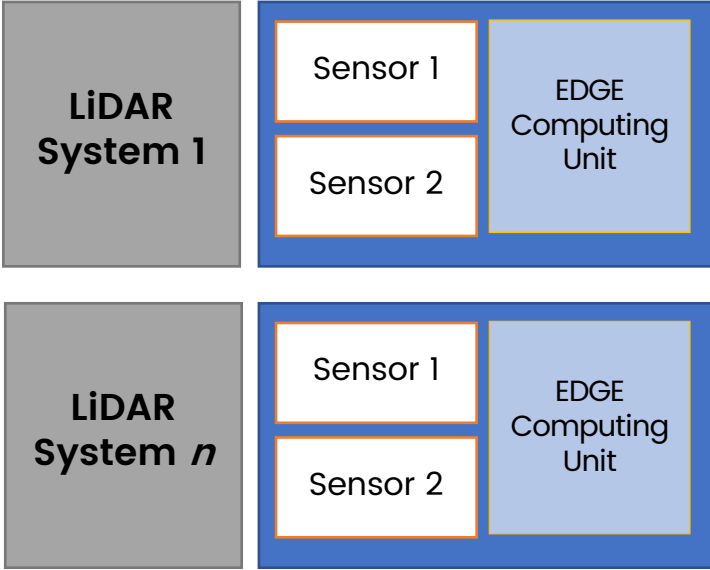
2. Solutions for LiDAR-based Smart City applications



Stationary
LiDAR-System



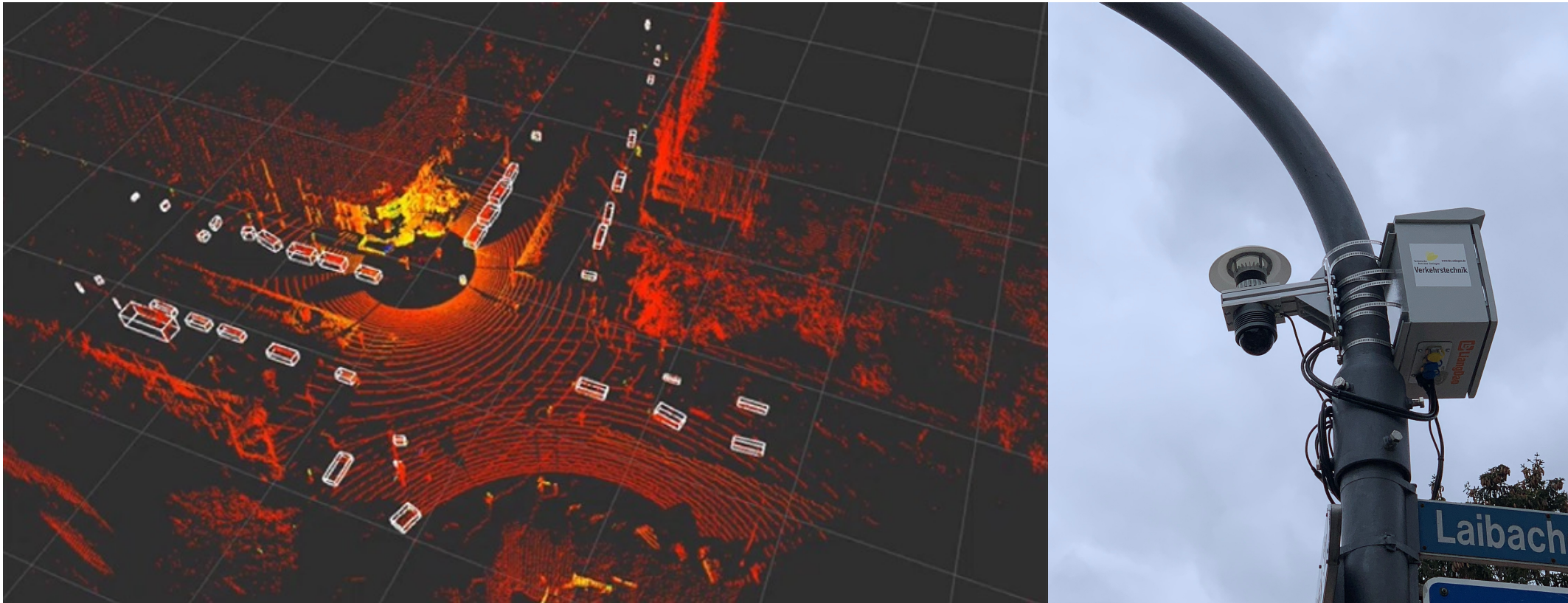
Mobile
LiDAR-Station



Fusioned
LiDAR-System

2. Stationary LiDAR-System Point Cloud with Object detection

FMCW LiDARs can detect moving & static objects in a single frame



Stationary LiDAR sensor system:
multi lane recognition, **360°** perspective, **object classification**, modular system setup

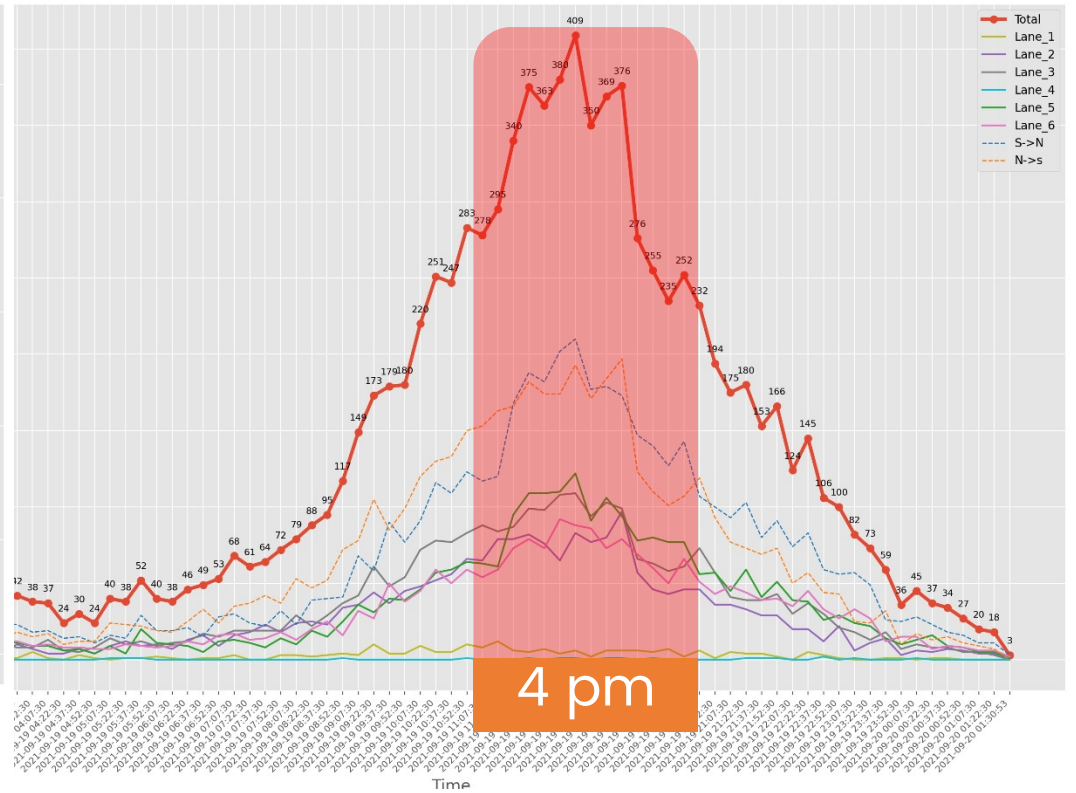
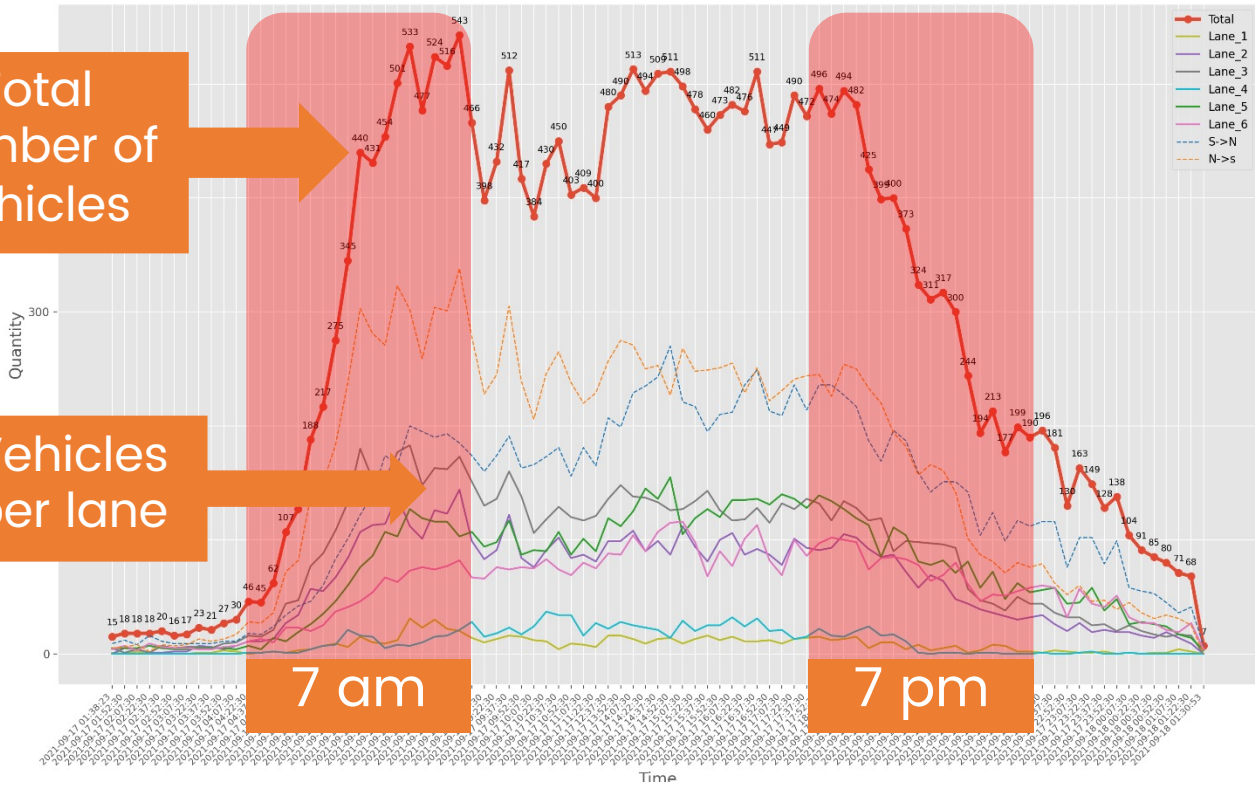
2. Traffic Data Analysis over time, by lane and direction

Weekdays

Weekend

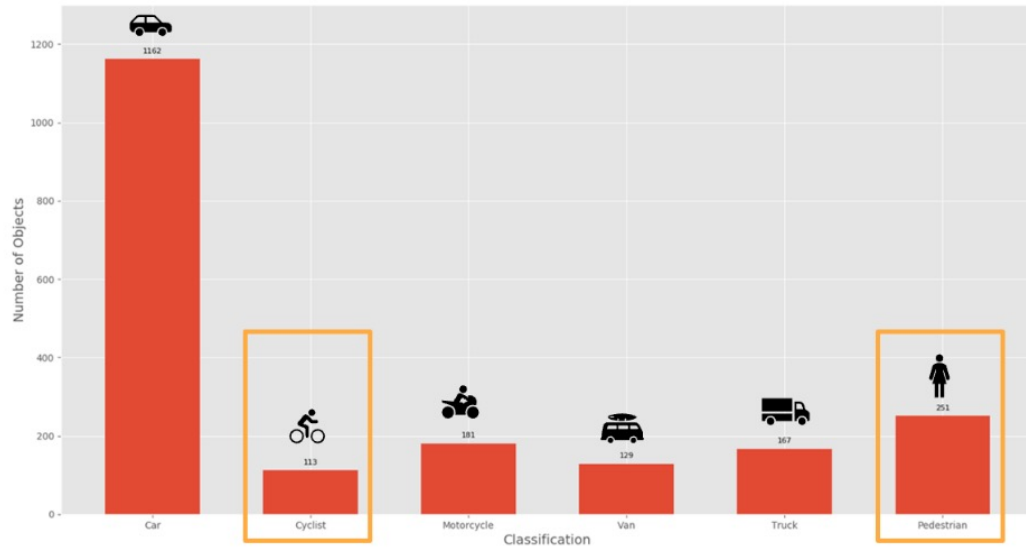
Total number of vehicles

Vehicles per lane

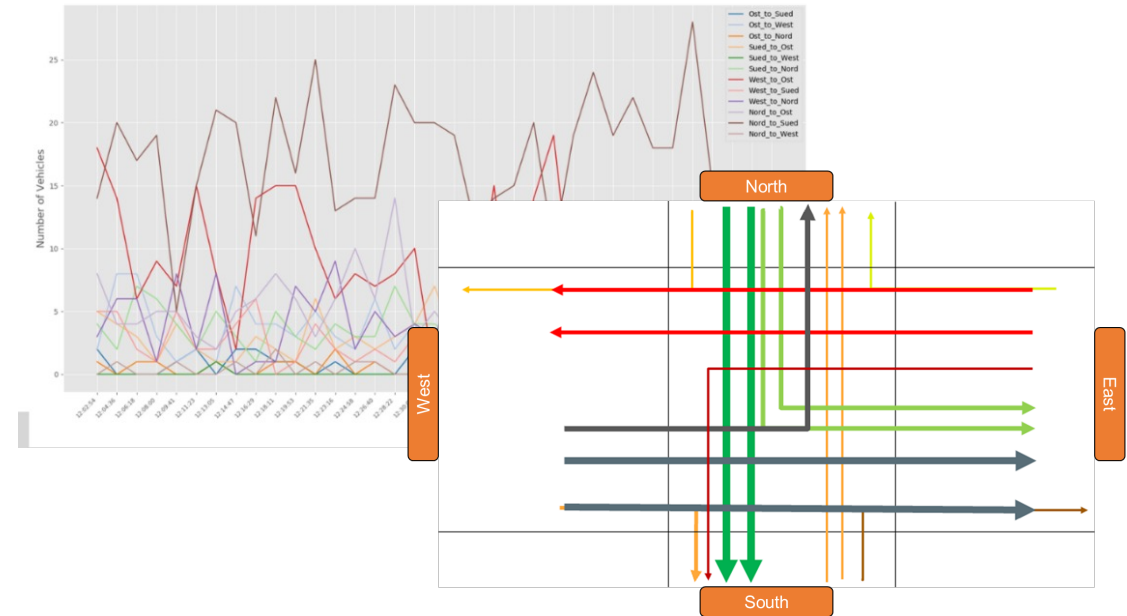


Several traffic analysis schemes total and per lane

2. Traffic Data Analysis over time, by lane and direction



Traffic object identification and counting



Traffic direction detection

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KIsSME



Supported by:



- Focus in AI for environmental perception with the aim to develop AI for future mobility

Consortium partners:



ASIMOV



- Focus on Digital Twins with AI-agent for accelerating autonomous driving

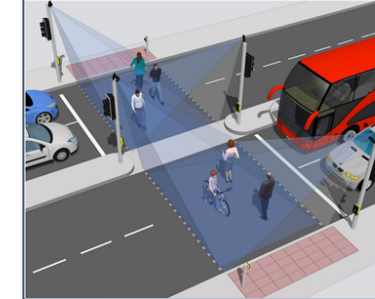
German partners:



Supported by:



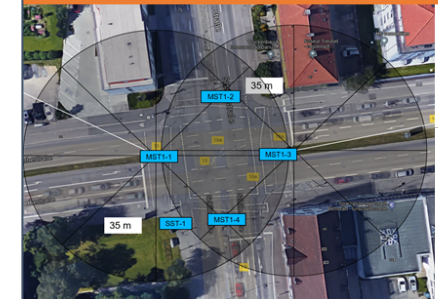
Contactless Pedestrian Crossing



5GoIng: vehicle to everything V2X



KIVI: Sensor fusion



3. Customers & Partners & Awards

Customers



Partners



Awards



Winner of Munich City Innovation Award 2021



1. What can we do for the community?

We provide LiDAR-based system solutions for intelligent mobility (automotive & smart city)

2. What can the community do for us?

We need support with various customization of LiDAR hardware to fit customer's needs.
e.g. optics, housings and mechanical studies, manufacturing, validation, certification, etc.

THANKS

ENLIGHTEN
FUTURE
MOBILITY