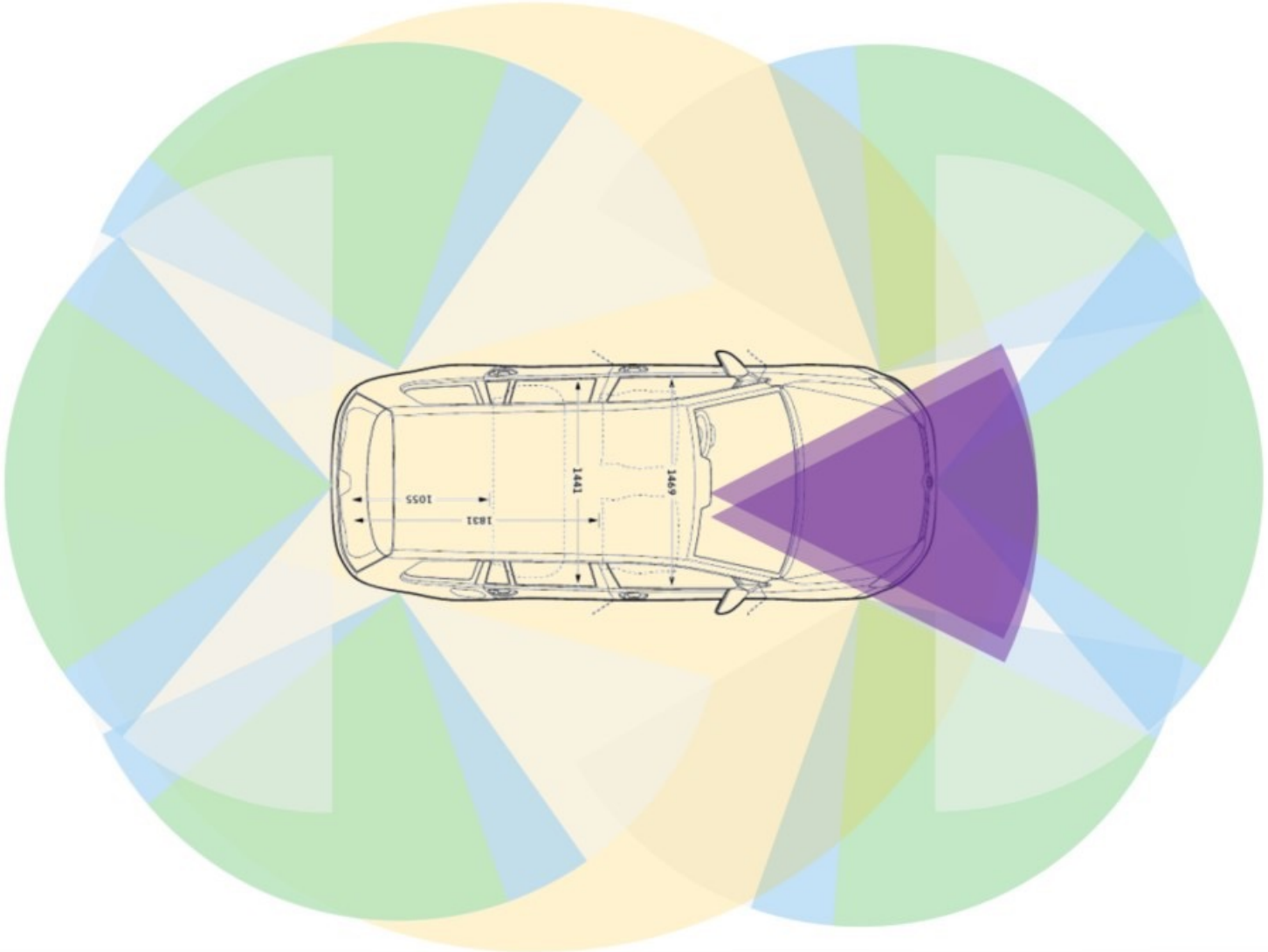
KI Data Tooling Final Event | 05/06 December 2023

Deep Dive #2
Real Data

Andrea Kraus | Valeo

Recording Cars

Recording Cars - Bosch



- 6x Bosch Imaging Radar
- -10dB @ +/- 35°
- -20dB @ +/- 50°
- Az.-unambiguity +/-90°

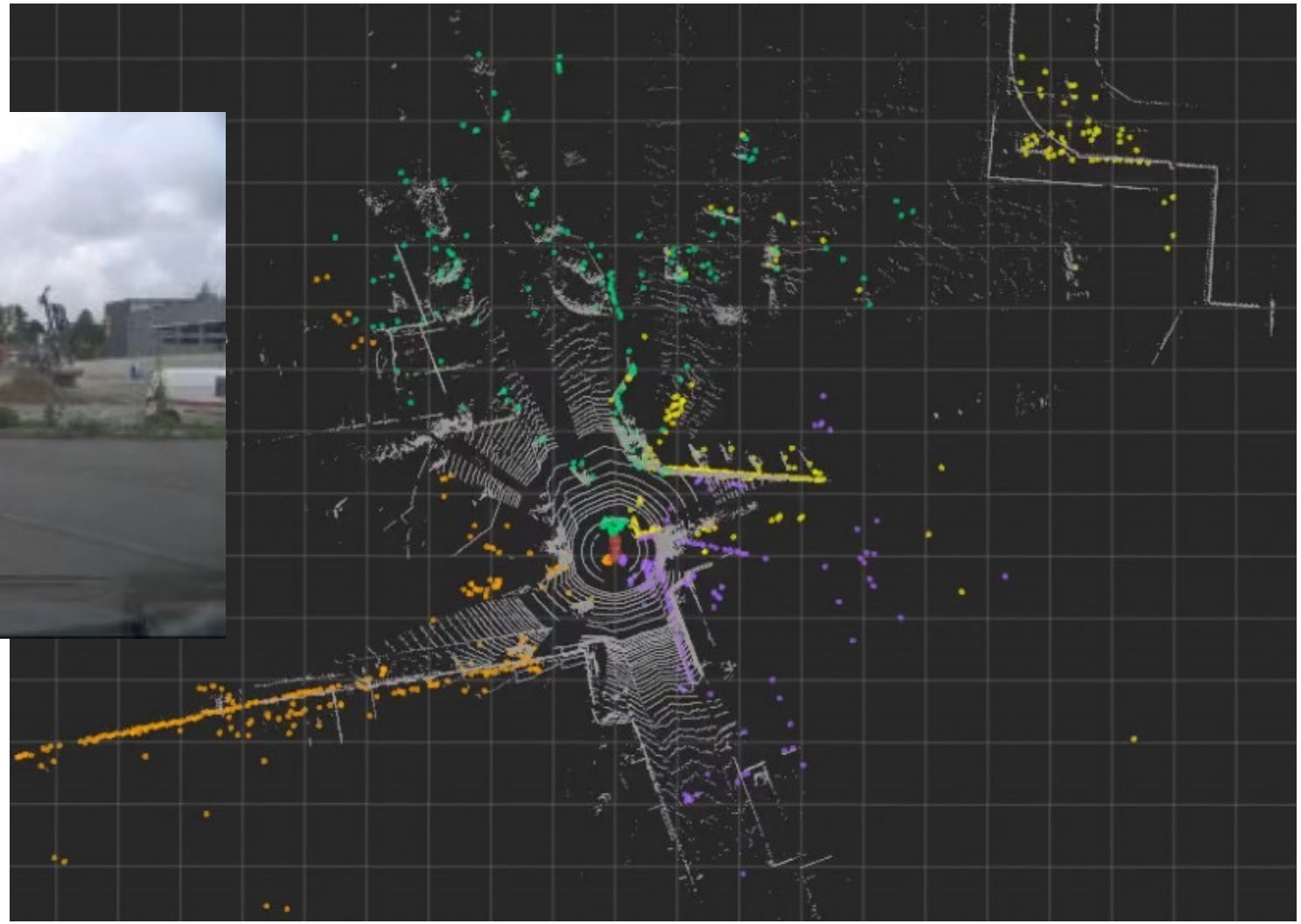
- AtomOne Stereo Cams
- Raw data mode
- Realtime H264 encoder mode as docu cam

- Hesai 360° Lidar
- Reference & documentation sensor

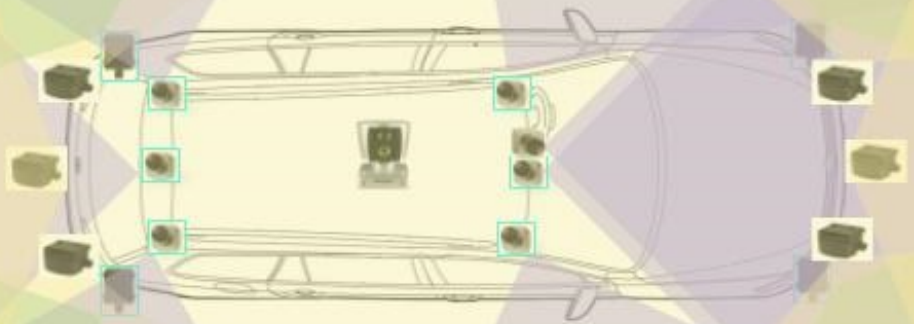
- Displays visual demonstration to up to 3 passengers

- High computation power due to 2 PCs partly equipped with Nvidia GPUs

Recording Cars - Bosch



Recording Cars - Valeo



- Valeo Reference Camera
- 1280 x 800 px
- jpeg compressed

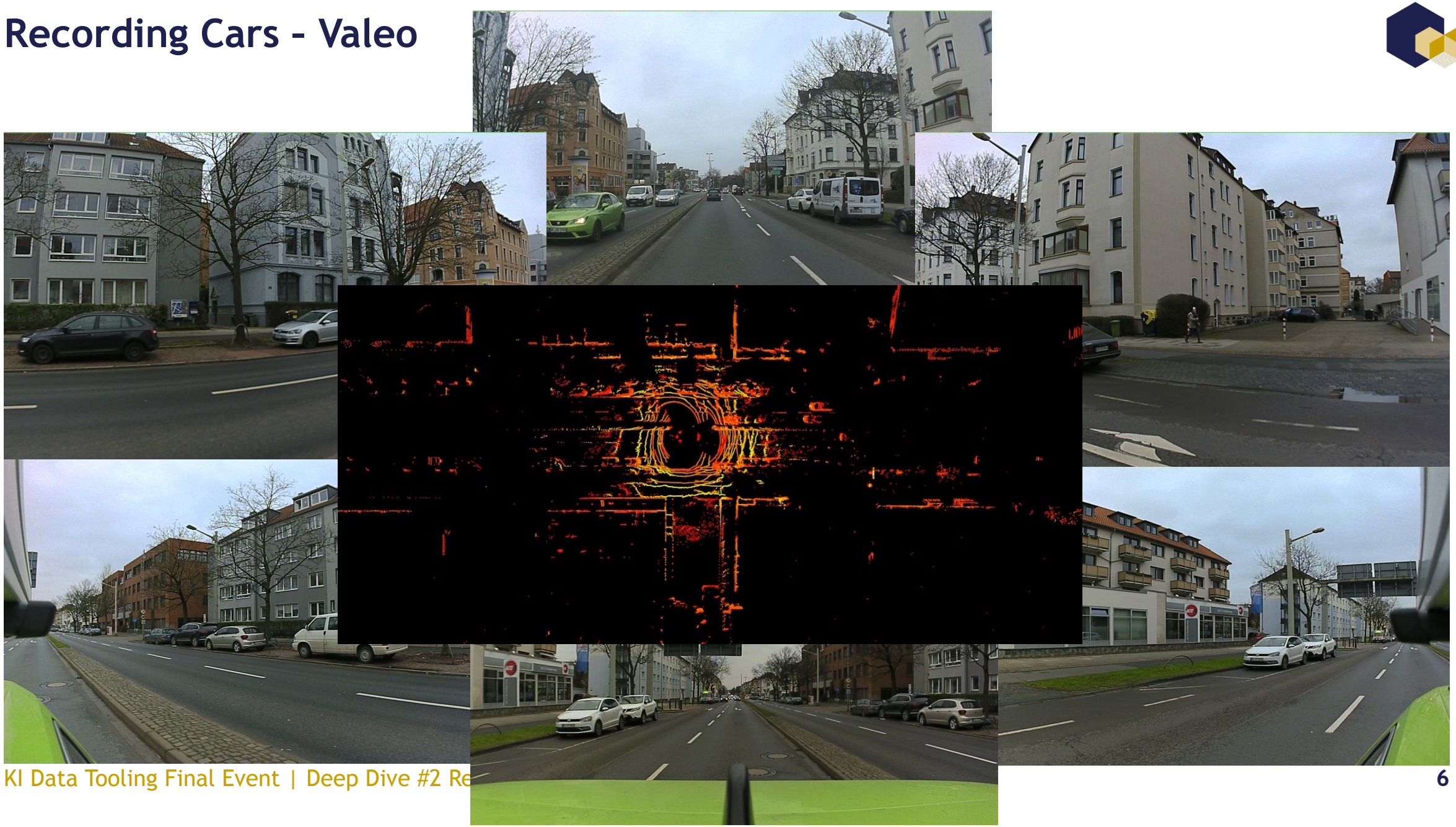
- FLIR Blackfly S GigE
- 1920 x 1200 px
- BayerBG output

- Valeo Mobility Kit Scala
- 16 layer
- 360° HFov, 10° VFoV

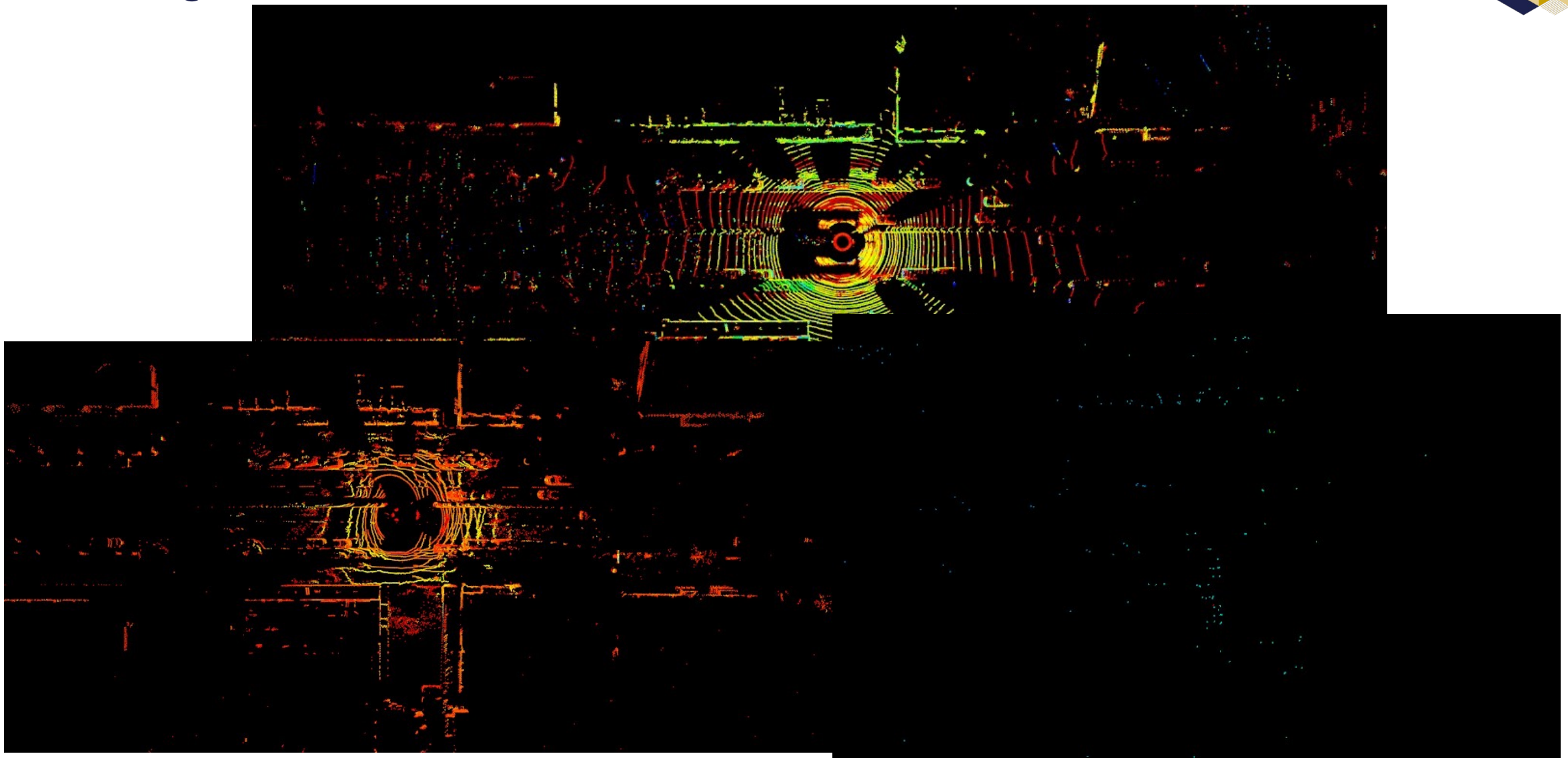
- Velodyne HDL-64E
- 64 layer
- 360° HFoV, 26.9° VFoV

- Valeo Radar Cocoon
- 130° HFoV, 24° VFoV
- 70m range

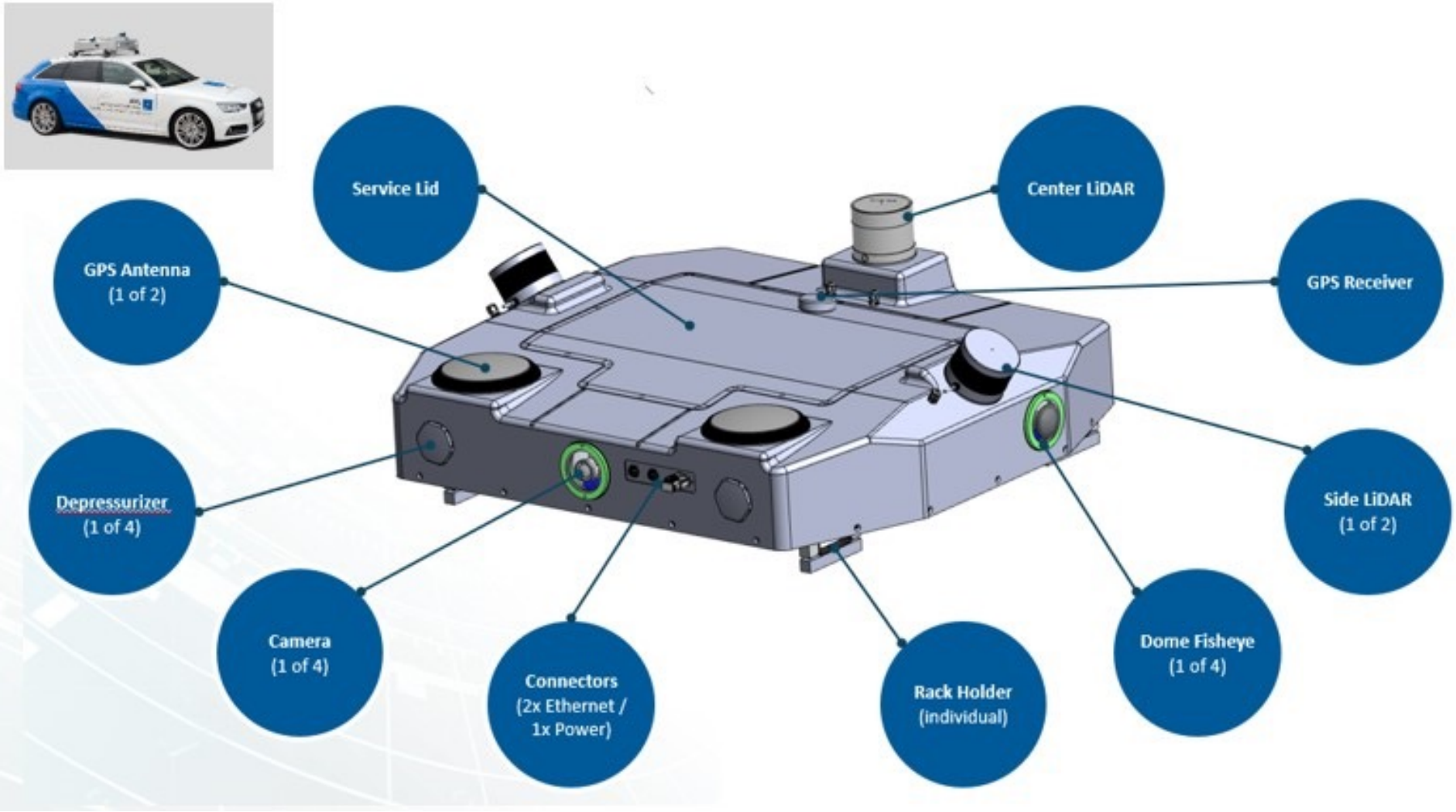
Recording Cars - Valeo



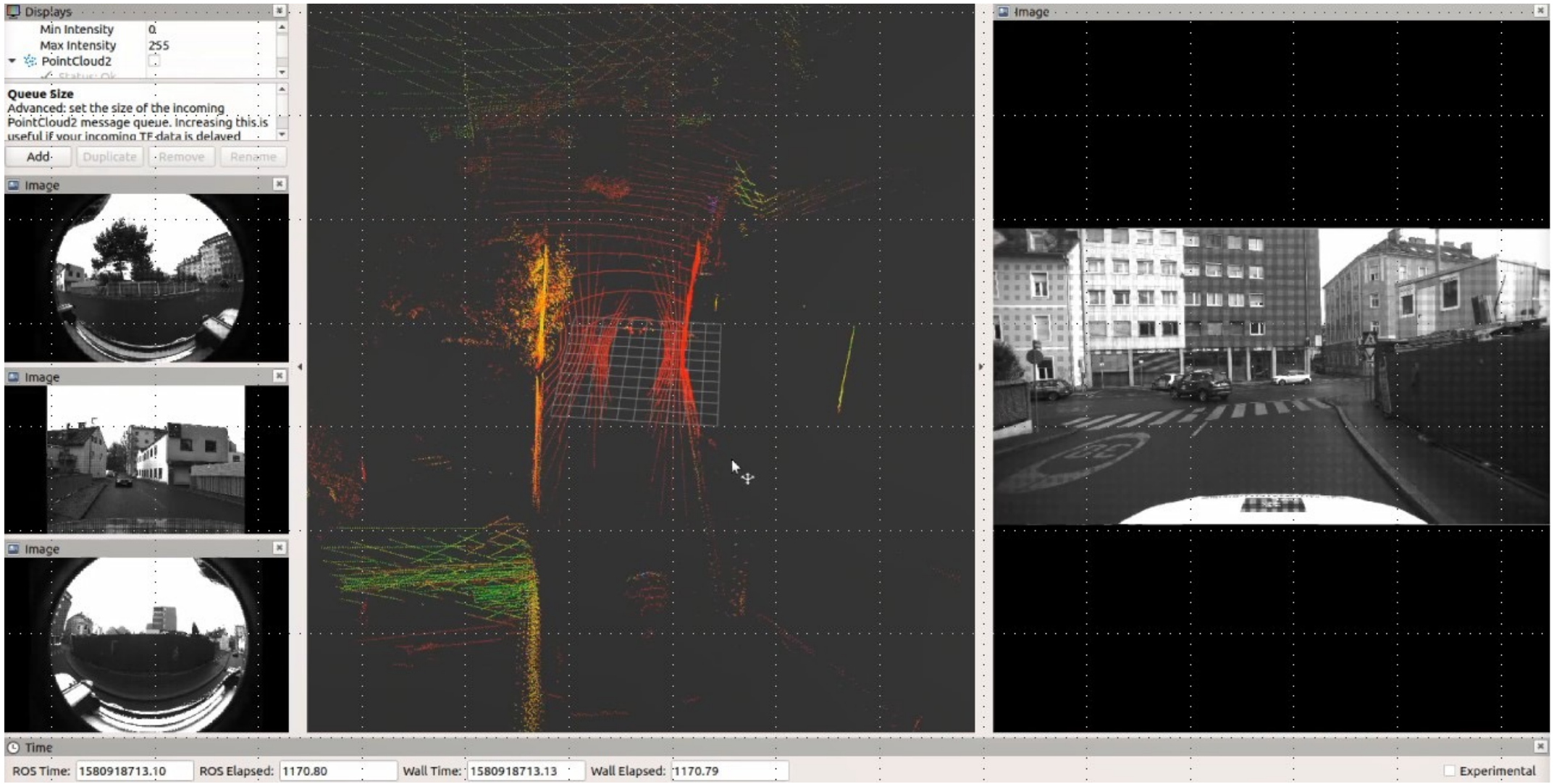
Recording Cars - Valeo



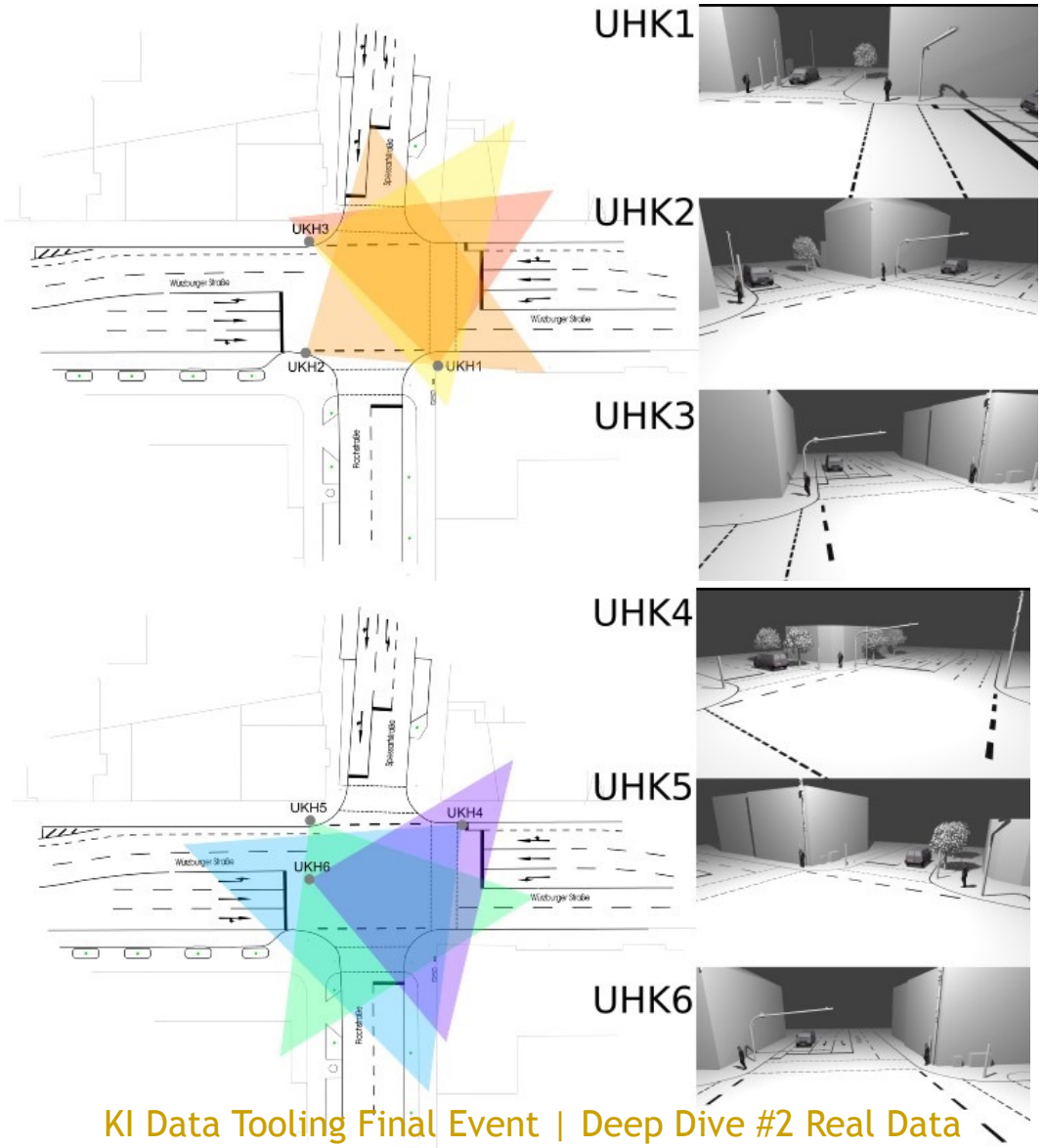
Recording Cars - AVL



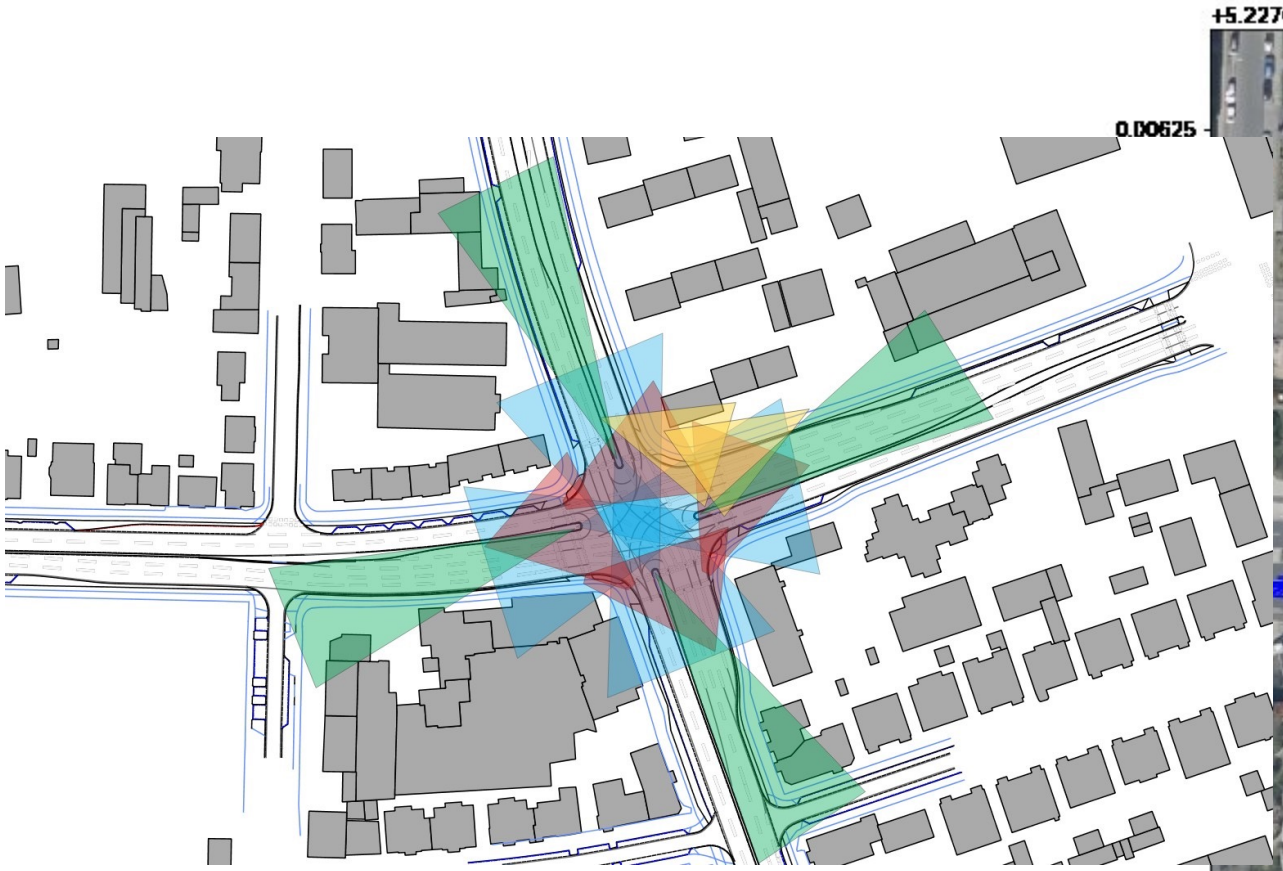
Recording Cars - AVL

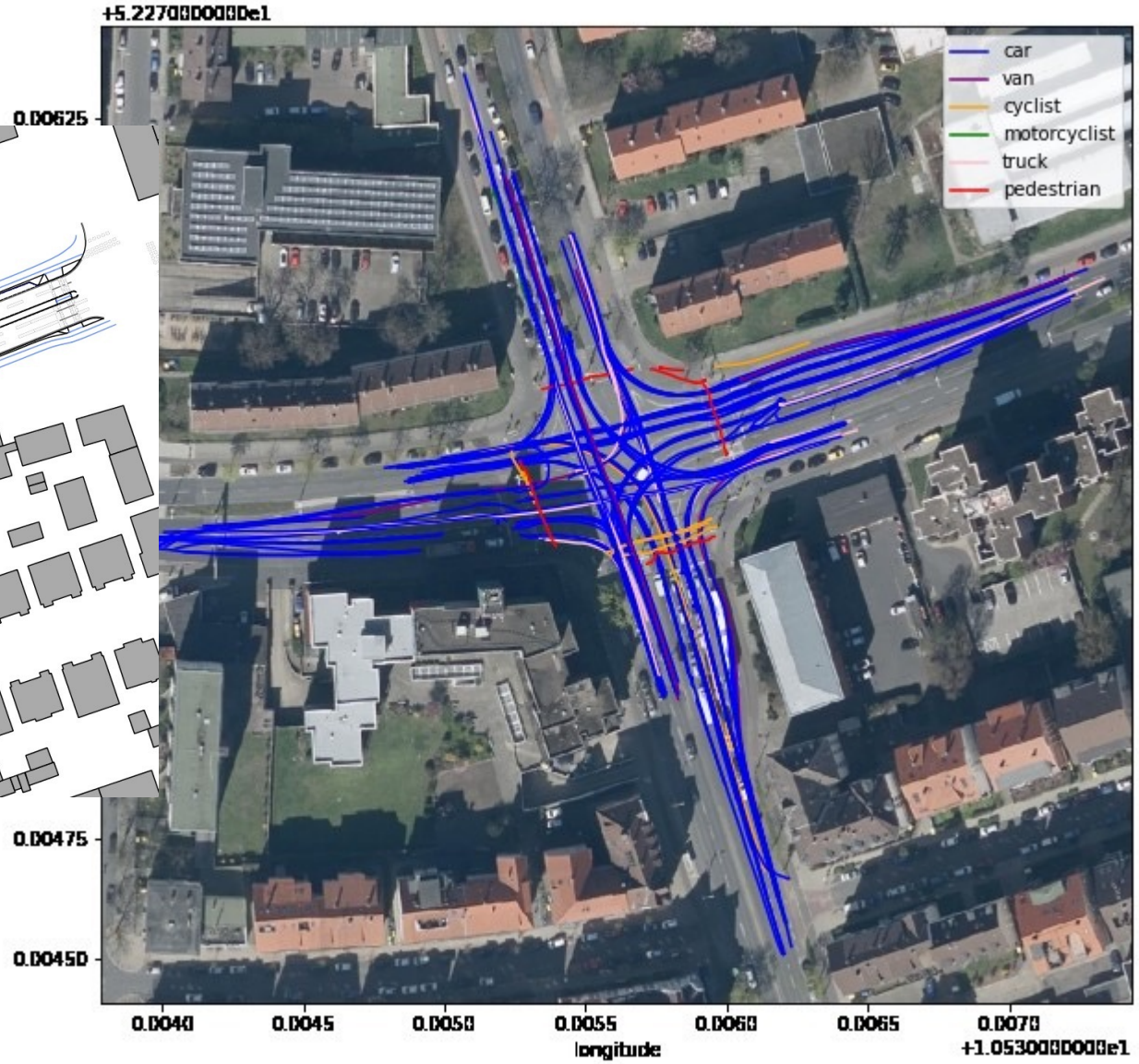


Intersections - Aschaffenburg



Intersections - Braunschweig



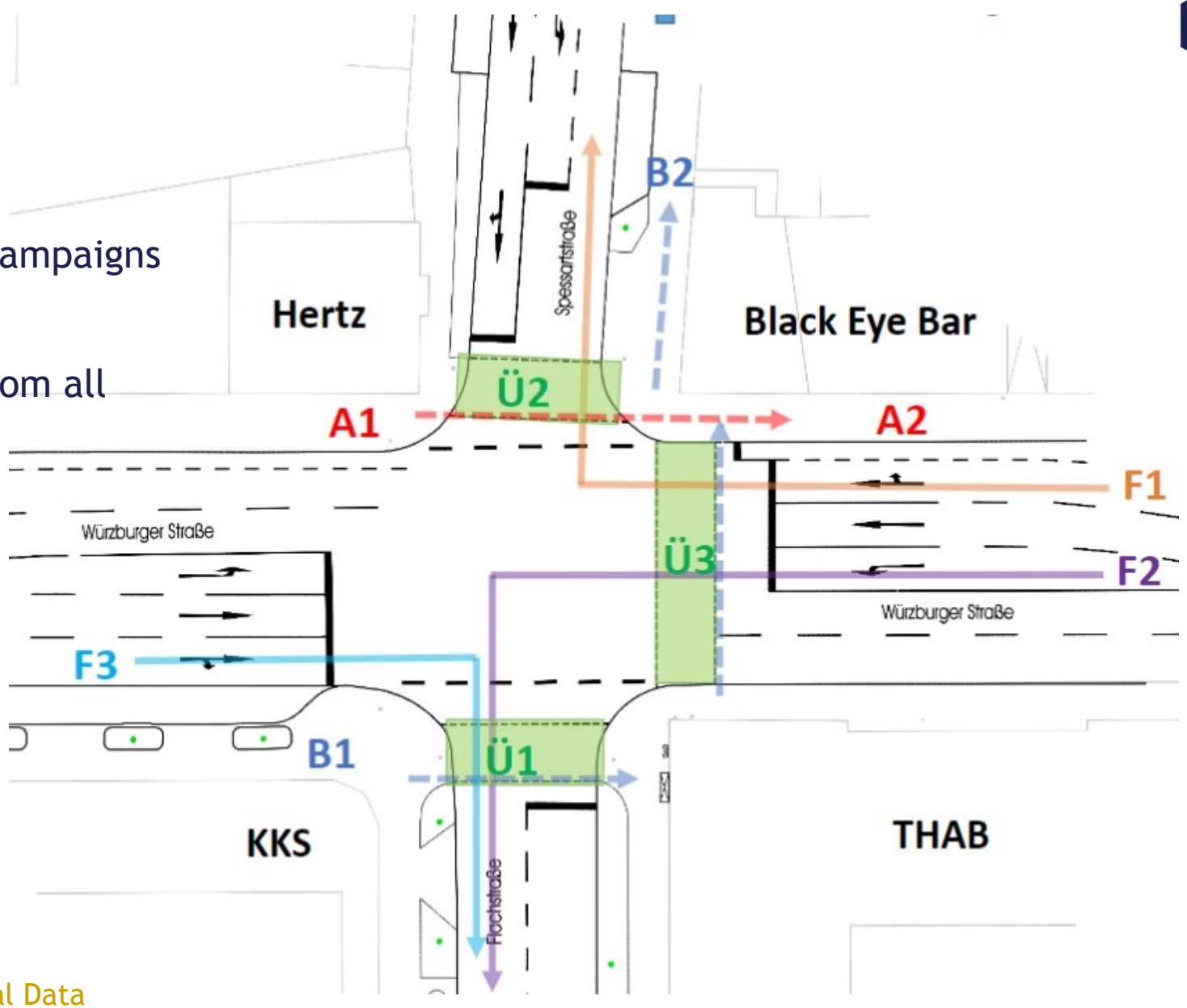


Sensor Synchronization

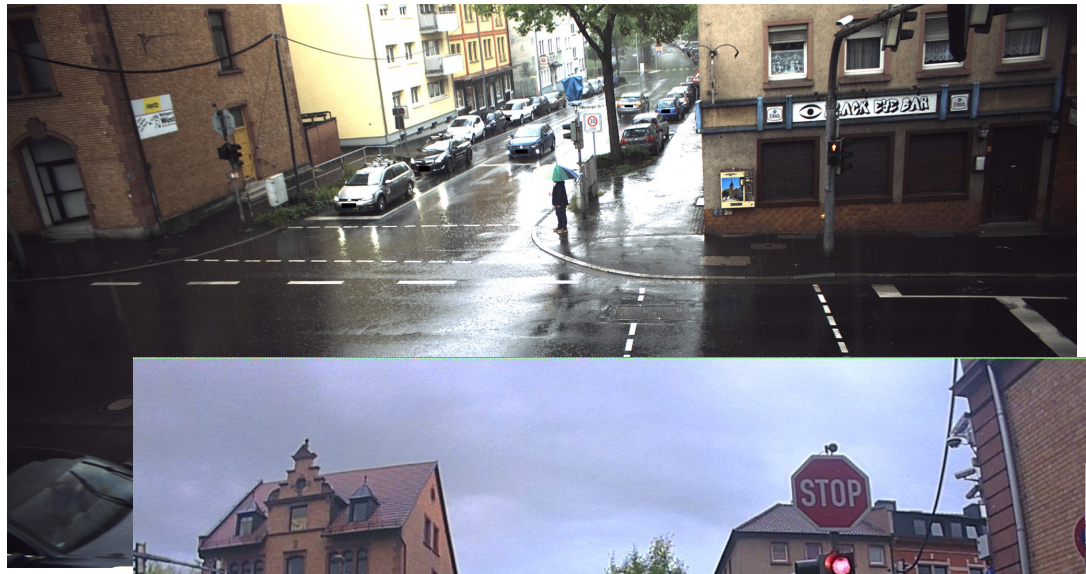
- All sensors have the same timebase, which makes a synchronization over intersection and car possible
- All sensors are internal and external calibrated
- As we have automotive sensors, no triggering possible, but software synchronization processed

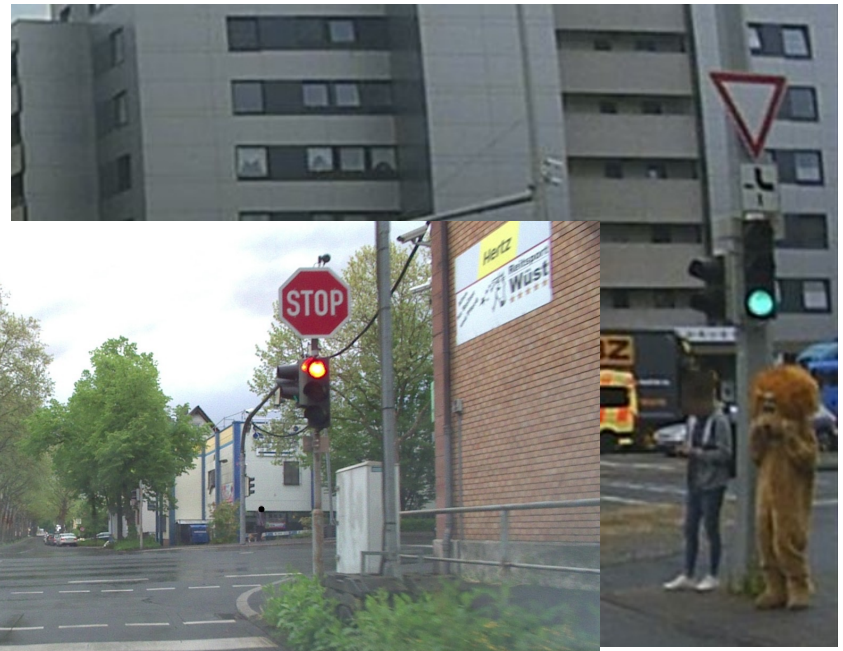
Measurement Campaigns

- Respectively two measurement campaigns on each intersection
- Recording of scenarios defined from all project members



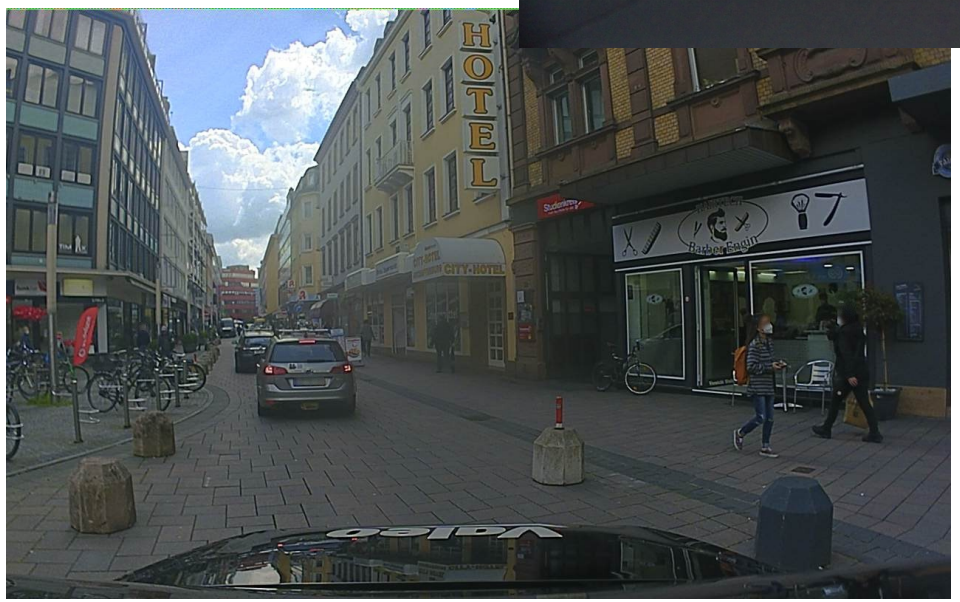
Measurement Campaigns



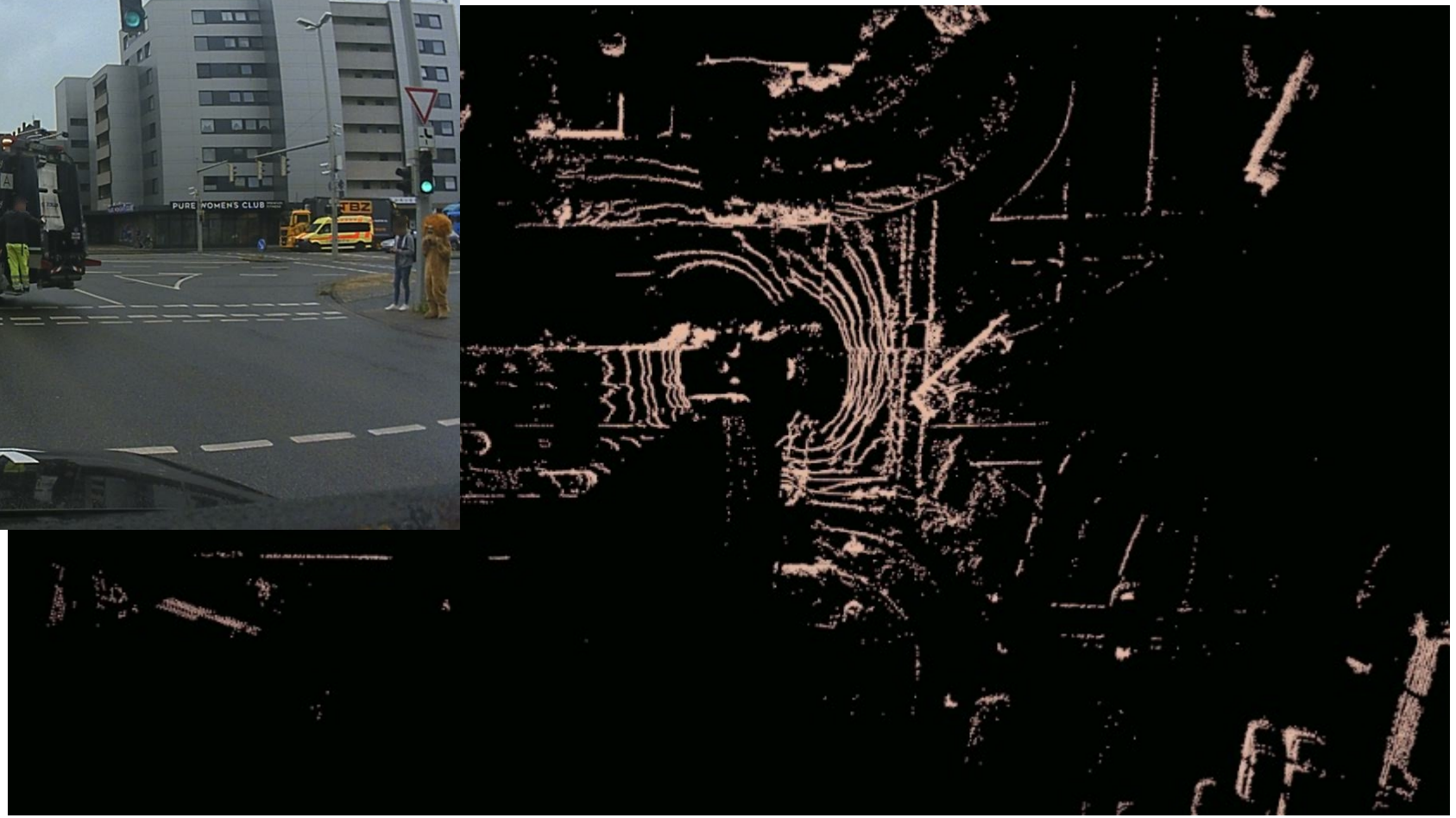


- Huge variants in timing and weather conditions
- Special corner cases with carried obstacles
- Dressed up pedestrians

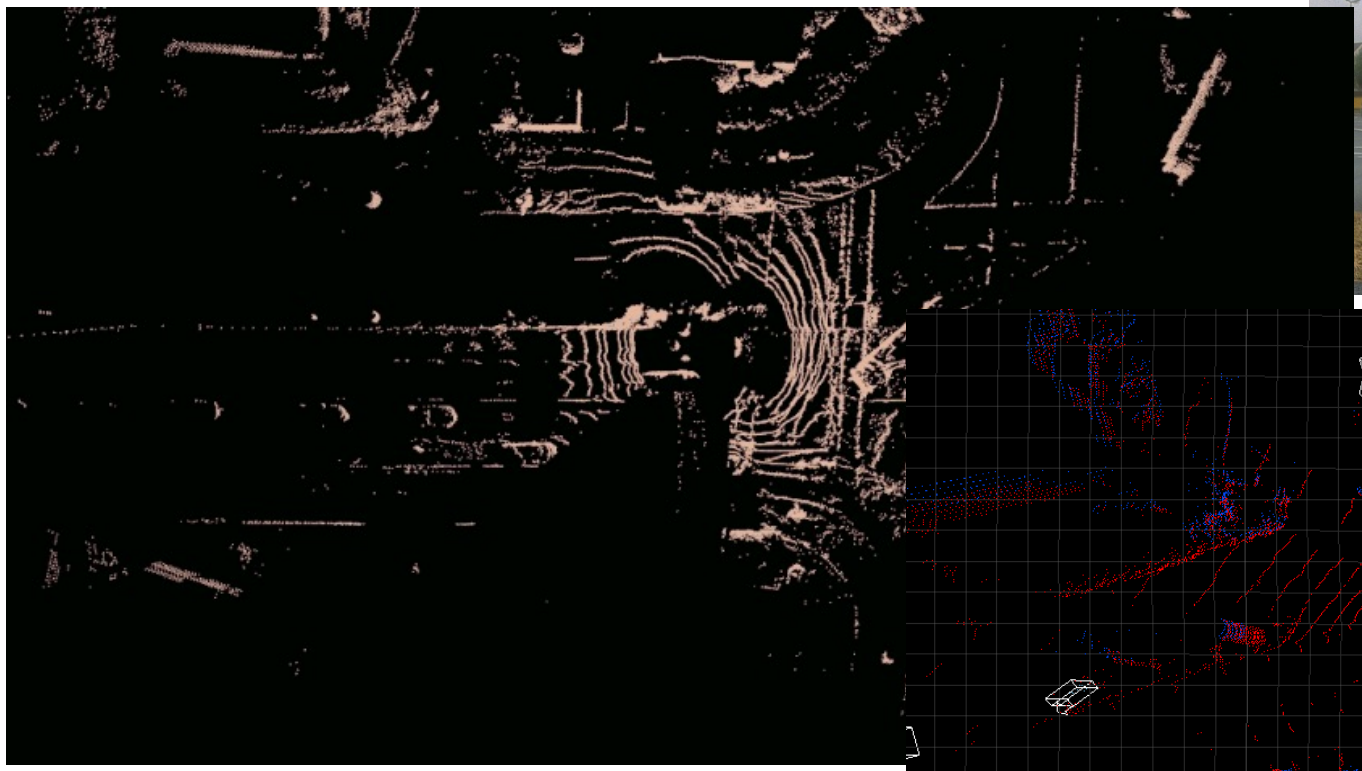
Free Drives

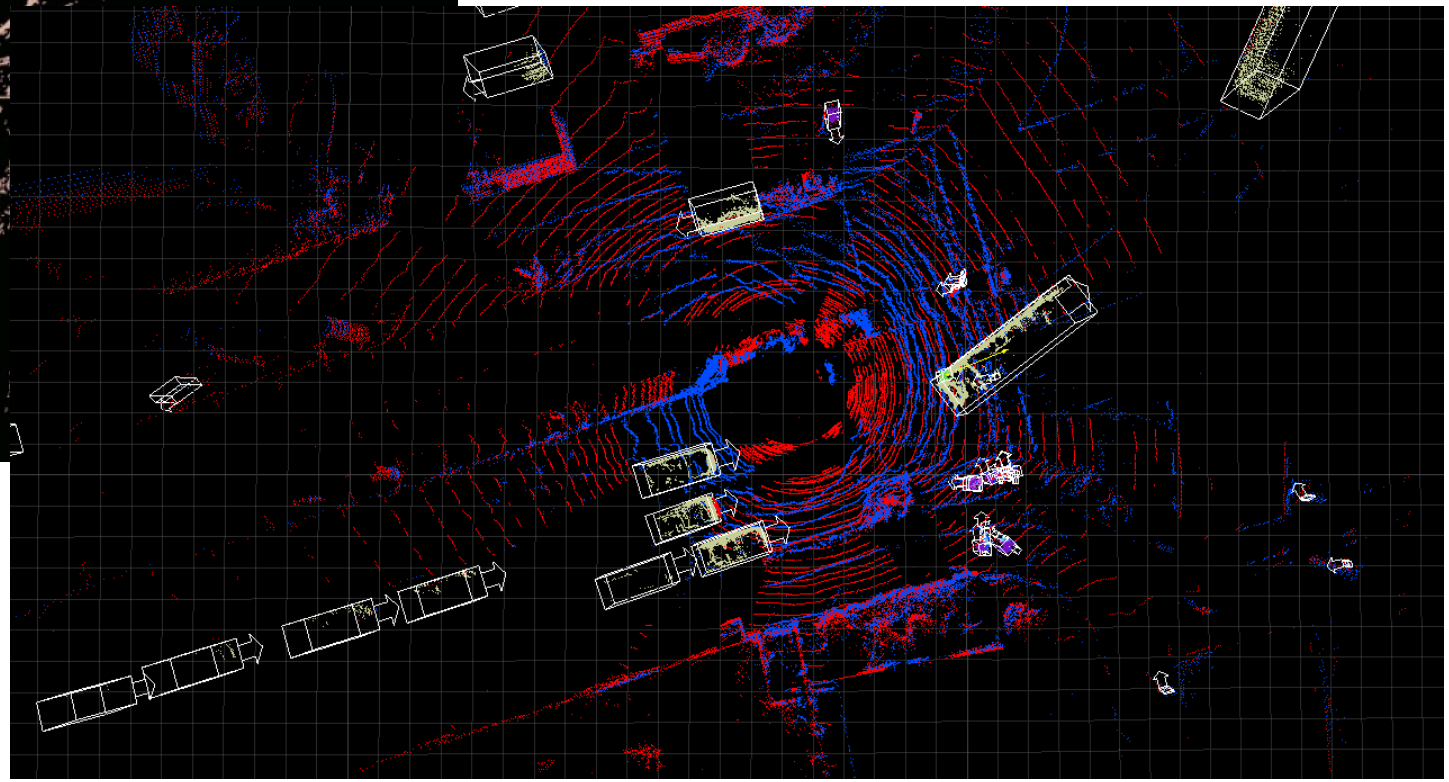


Labeling



Labeling – 3D Cuboids





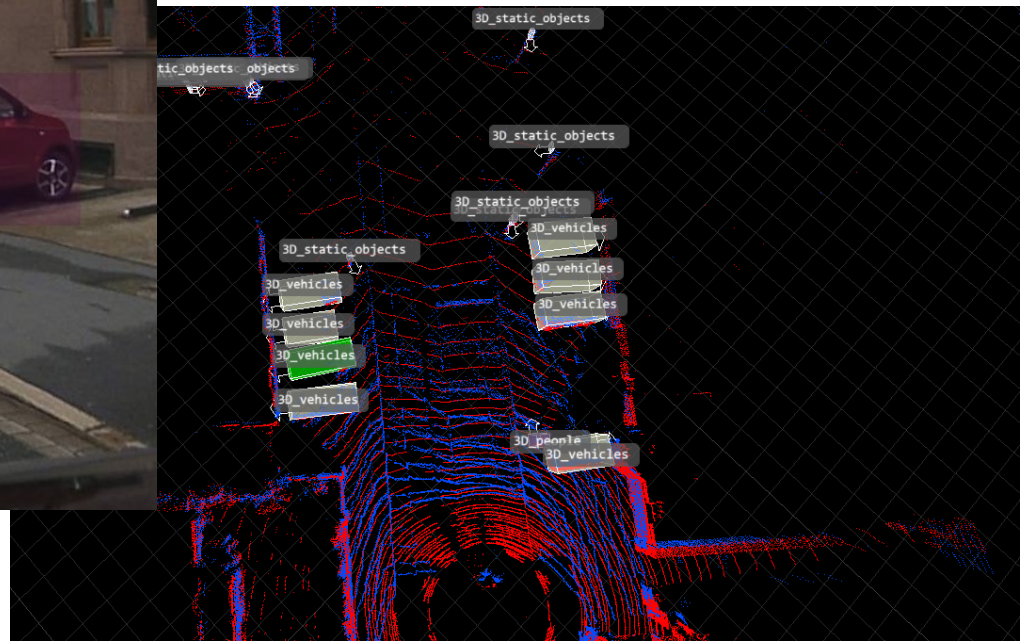
Labeling - 2D Bounding Boxes

1. Projection of 3D Cuboids into image
2. Keeping same ID for 3D and 2D
3. Adaption and fitting of 2D Bounding Boxes

Labeling - Semantic (Instance) Segmentation

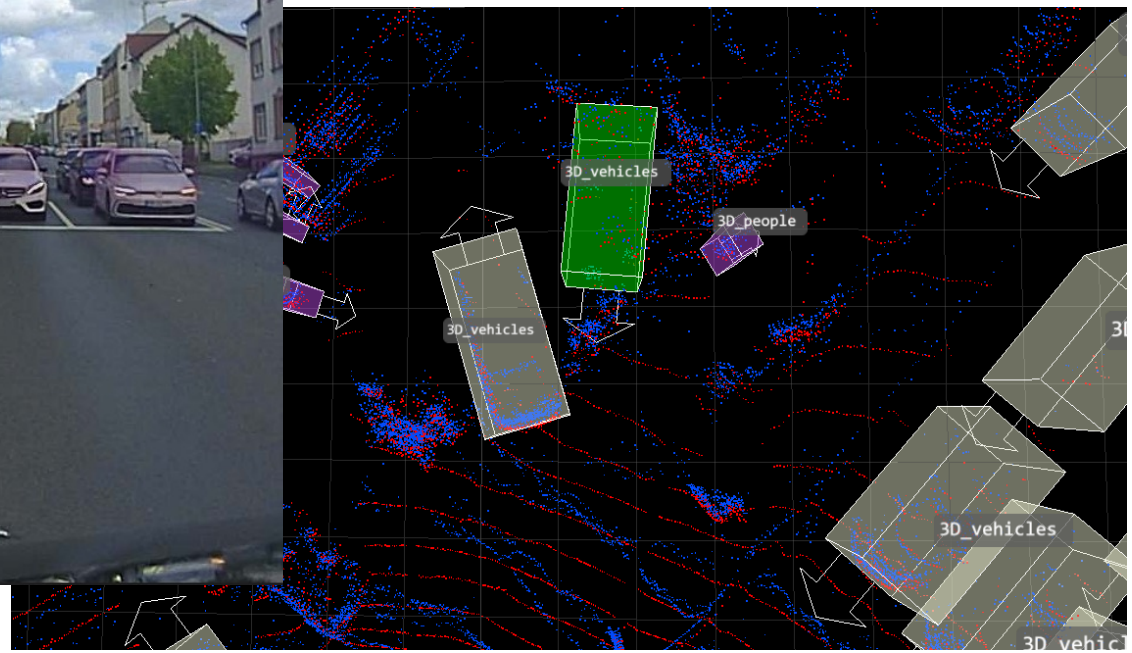
Labeling Policy - True Size

2D and 3D BB are labeled according to the real size of the object even it is partly occluded



Labeling - Heavily Occluded

Multimodal sensor data helps to label even heavily occluded objects



Labeling - Attributes

non_real attribute for objects on posters or for reflections

Labeling - Attributes

attached_to and has_rider attribute for better scene understanding

KI DATA TOOLING

The Data Kit for Automotive AI

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KI Data Tooling is a project of the KI Familie. It was initiated and developed by the VDA Leitinitiative autonomous and connected driving and is funded by the Federal Ministry for Economic Affairs and Climate Action.

KI FAMILIE

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