

Recording Vehicle



The setup contains 7 cameras, 7 lidars, 4 radars and an IMU/GPS unit. All sensors are calibrated to an ego vehicle reference, which is the middle of the rear axis. Time synchronization is achieved by using a GNSS antenna and PTP (Precision Time Protocol).

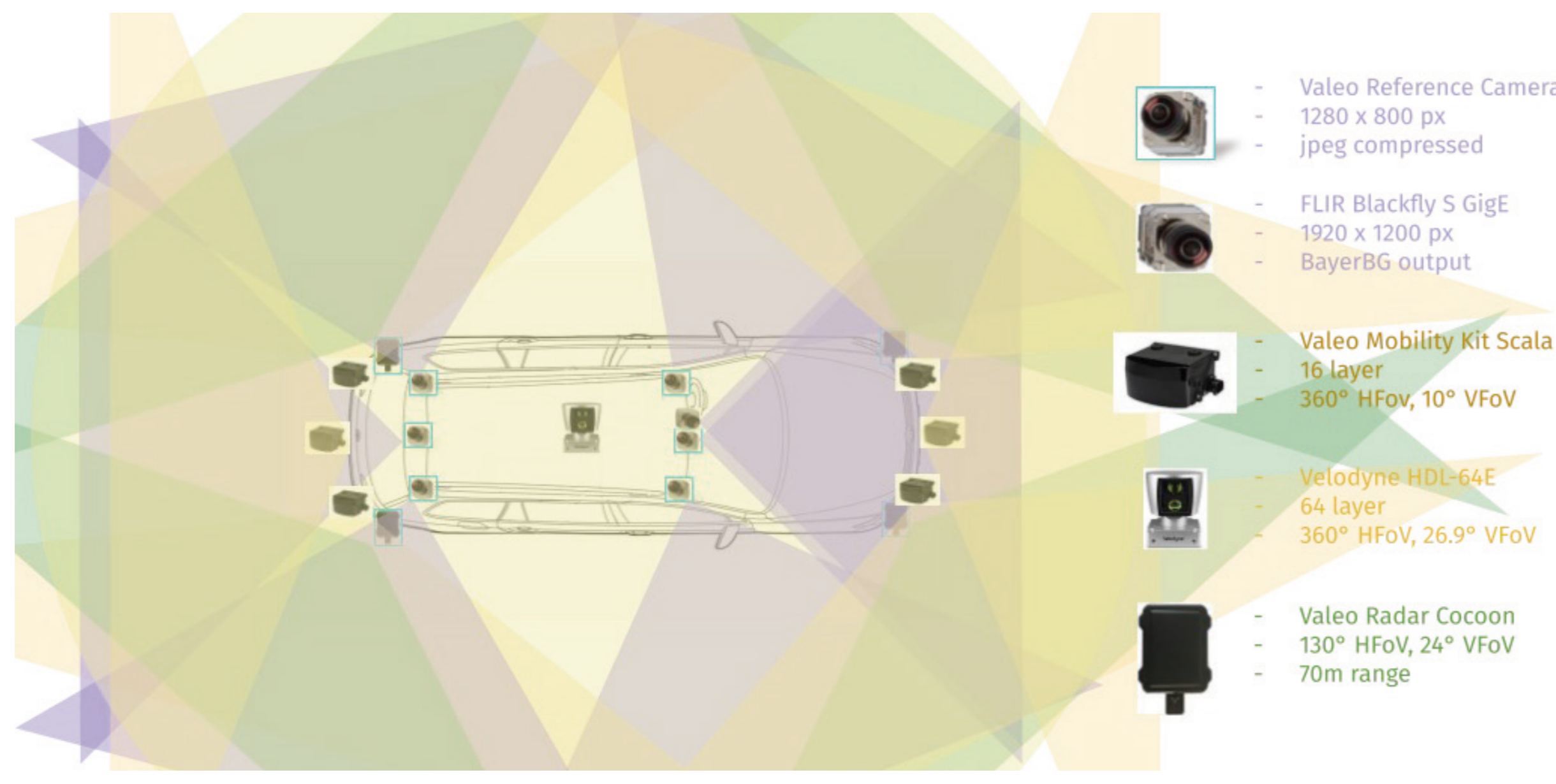


Figure 1: Field of view and position of each sensor (© Valeo)

Measurement Campaign

We did several measurement campaigns at the research crossings. A scenario catalogue with detailed scenario descriptions was created beforehand.

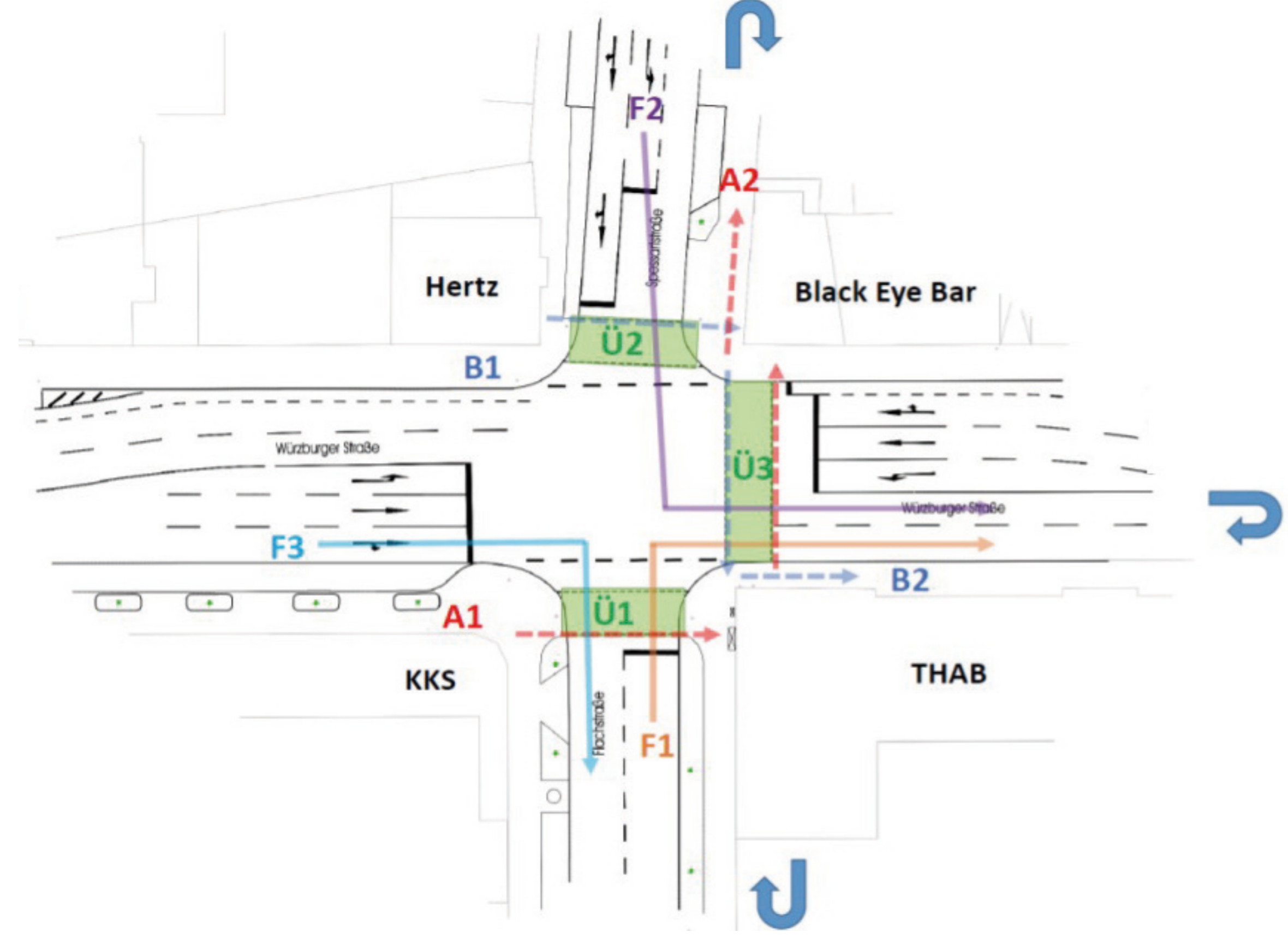


Figure 2: Exemplary scenario description for Aschaffenburg crossing. A and B are pedestrians, F1, F2, F3 are recording vehicles (© TH Aschaffenburg)



Figure 3: Example of scala cloud and camera image from Aschaffenburg recording campaign (© Valeo)

Labeling

A labeling guide includes all rules on how to label the data set. It specifies the classes and how to deal with edge cases. We label semantic instance segmentation, 2D and 3D bounding boxes. Our labeling partner understand.ai provided a tooling for reviewing the annotations.

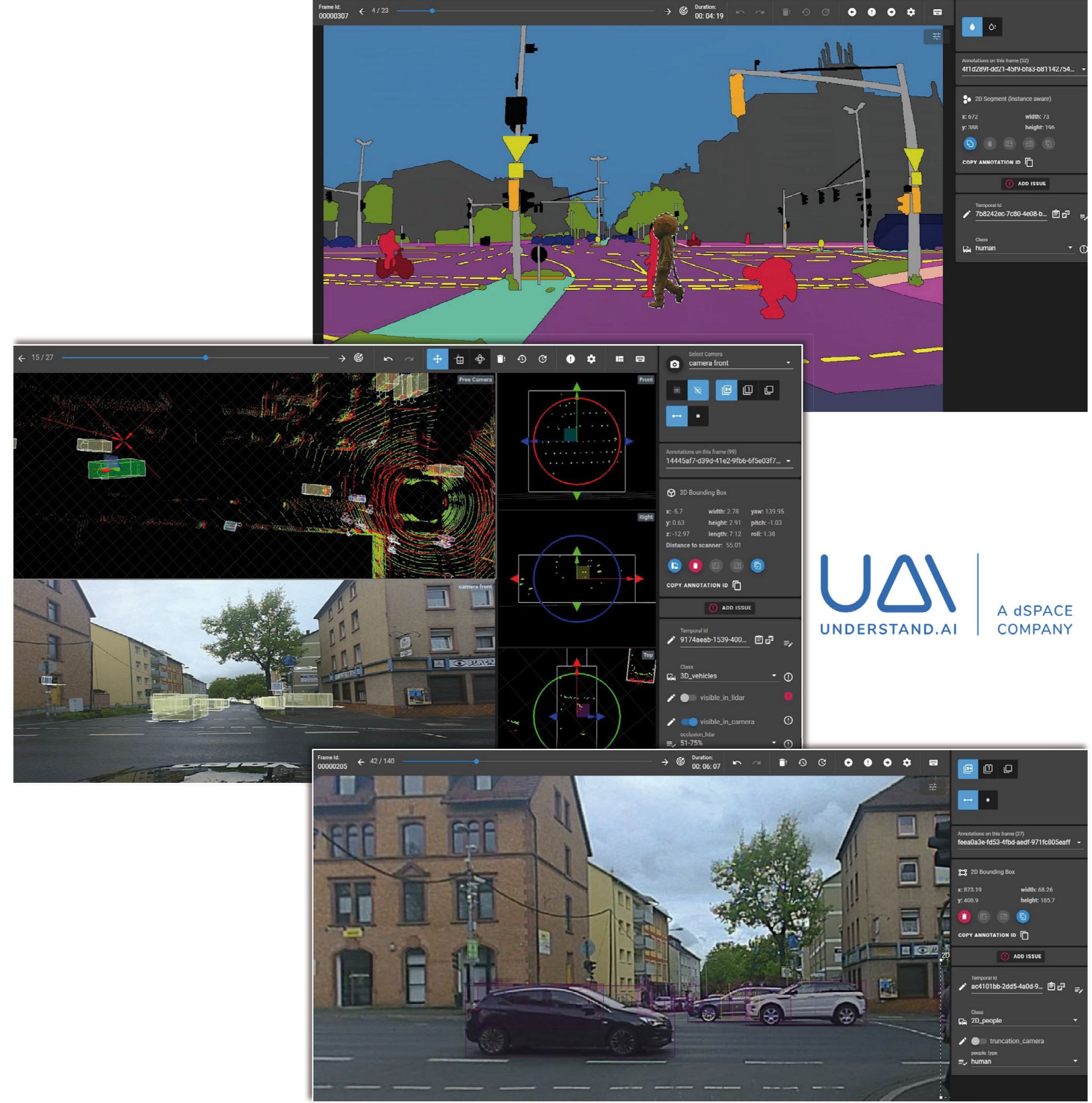


Figure 4: Annotation and Review Tool from (© understand.ai)

Data Enrichment

Meta data are automatized extracted from CAN information and developed algorithms into a common json file. It includes e.g. road and vehicle properties, weather conditions and scene description.

```

"00000000": {
  "roadProperties": {
    "environment": "urban",
    "nearbyObjects": [],
    "numberOfLanes": 2,
    "roadMaxspeed": 13.888888888888889,
    "roadType": "tertiary",
    "trafficLights": [],
    "trafficSigns": []
  },
  "sceneProperties": {
    "maneuvers": [
      "LANE_KEEP"
    ]
  },
  "time": 1608717621719171,
  "weatherData": {
    "lightingSituation": "daylight",
    "lightSensor": 1602,
    "outdoorTemperature": 12,
    "precipitationLevel": 0,
    "rainSensor": 20,
    "sprayLevel": 25,
    "sunPosition": {
      "azimuth": 164.2051277967366,
      "elevation": 14.965562192977812
    }
  },
  "weather": "cloudy"
}
    
```

Challenges to be addressed

- Labeling consistency & edge cases
- Sensor fusion (scala cocoon & radar)
- Time synchronization and calibration

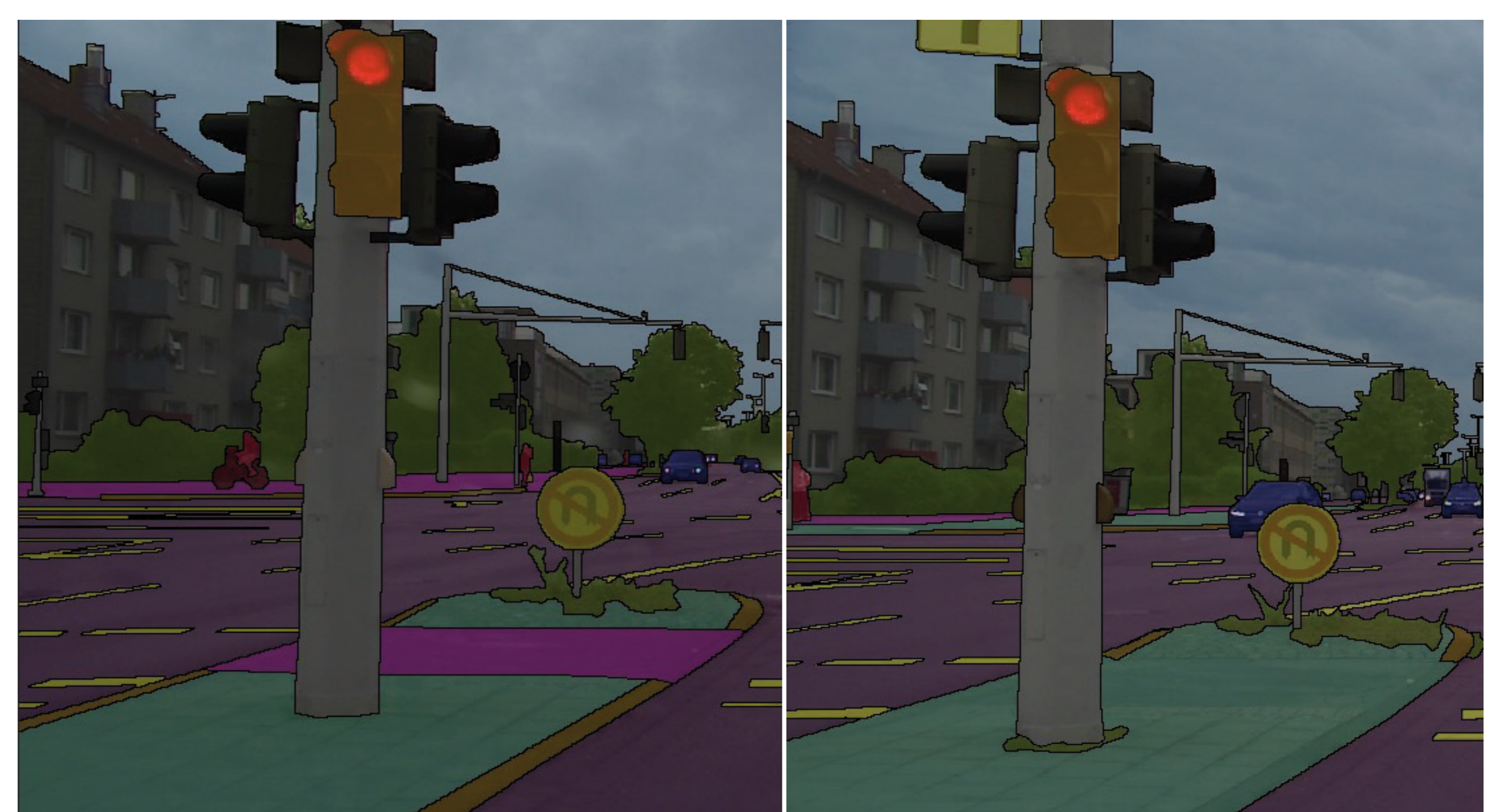
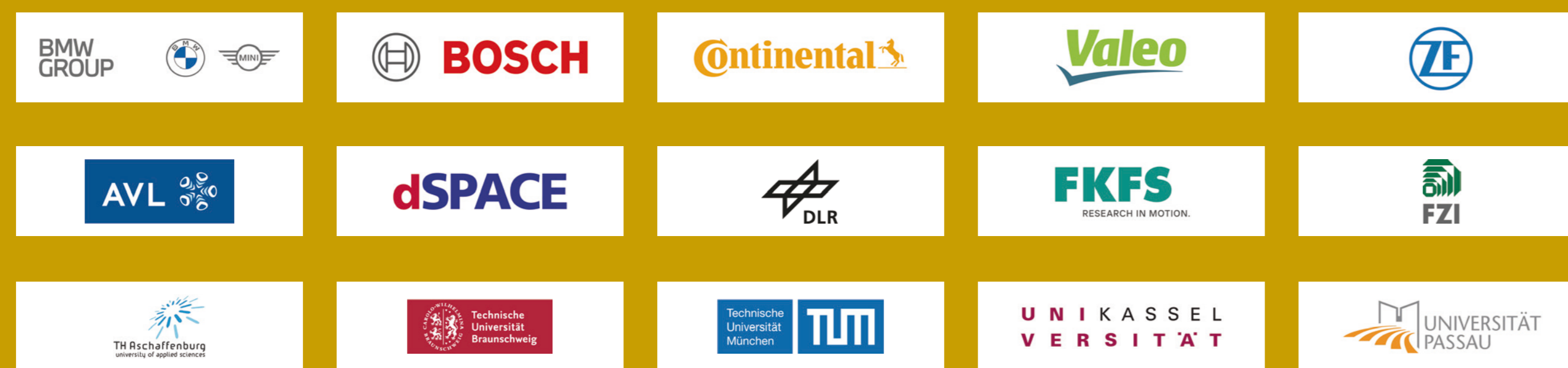


Figure 5: Semantic segmentation of the same crossing from different sequences to visualize labeling inconsistency, found during review (© Valeo)

Partners



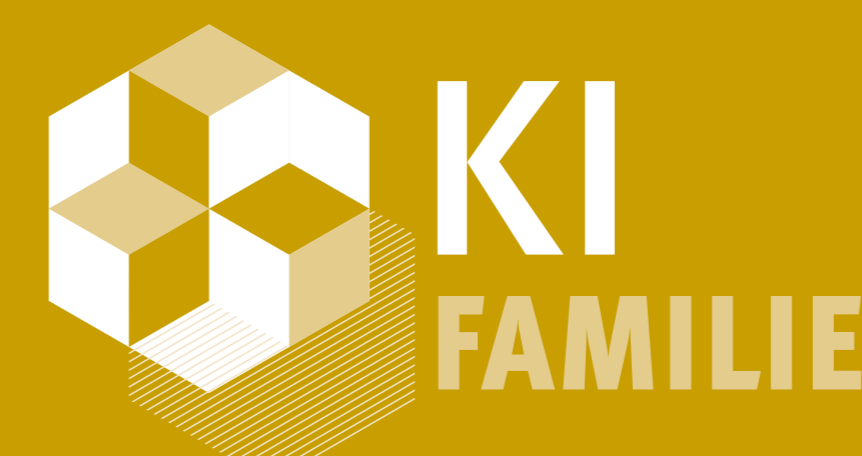
External partners



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Supported by:



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