



DATA CAPTURING & PROCESSING

Recording real world scenes with critical phenomena in an urban intersection and processing the data further to generate ground truth.

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Test Drive Specification

TP2 (Sub-Project) in VVM generates and provides a document relating to the critical scenarios to be captured in an urban environment. The document describes the functional scenarios using traffic.

Functional Use Case	FUC1-2 – Traffic with Right of Way and Occlusion 
Constraints	<ul style="list-style-type: none"> • 4-arm intersection with traffic lights • Ego performs unprotected left turn • Oncoming traffic has right of way • Oncoming traffic is occluded for radar sensor (e.g. by other vehicle in the conflict area)
Criticality phenomenon	Occlusion (Radar)

Fig.1 - Description of Functional Use Case for Test Drive Specification^[1]

Analyzing the Drive Specification

This consists of further sub-tasks

- Analyzing the scenario description for safety i.e., if the maneuver could be captured in a real-world intersection or in a proving ground with NCAP dummies.
- Searching for real-life (or proving ground) intersections, which fulfills the criticality requirements. AVL tool Juncel comes very handy to find real-world intersections across Germany with various filter and search criteria, like geometry (4-arm,3-arm,etc), presence of traffic light, pedestrian crossing, etc. Juncel has integrated several sources of map data (e.g. OSM) and also content from the “Unfallatlas” (AccidentAtlas map) database, which is also used to search intersections where a certain accident phenomenon (potentially critical) has occurred multiple times.

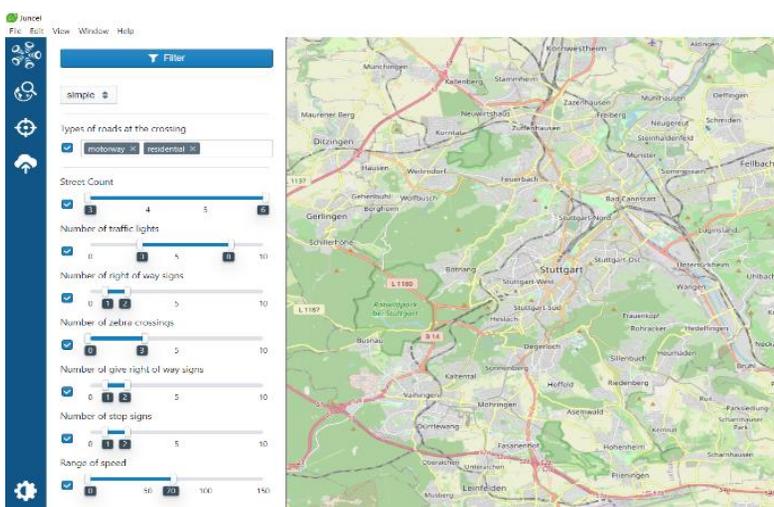


Fig.2 - AVL Tool Juncel to search Intersections with specific properties

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Drive Preparations and Capturing

- Preparing the optimum route for vehicle data capturing, considering additional factors like weather, time of day, direction of travel, additional traffic participants if needed, etc. in accordance with the scenario requirements.
- AVL Scenario Viewer (Live Sensor Data) helps to visualize the sensors perspective and decide the best time to start or stop recording. Thus, saving unnecessary data generation and filtering efforts.
- Selected criticality phenomena (e.g. Occlusion, unexpected behavior, ...) can be tagged online while driving and added as meta data to the scenario data using AVL DigitalLogbook on a tablet.

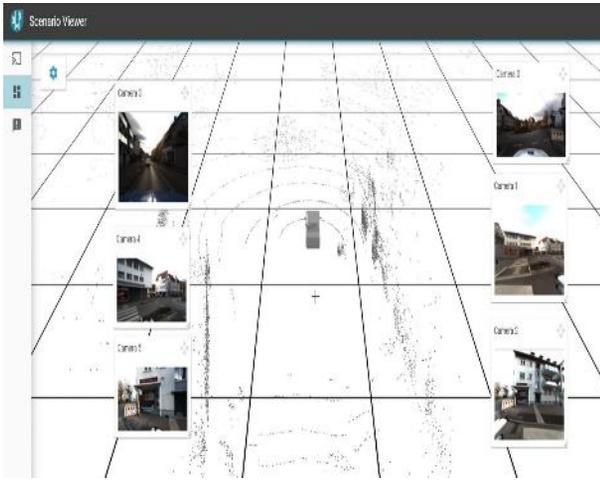


Fig.3.1 - AVL Live Sensor Stream Viewer

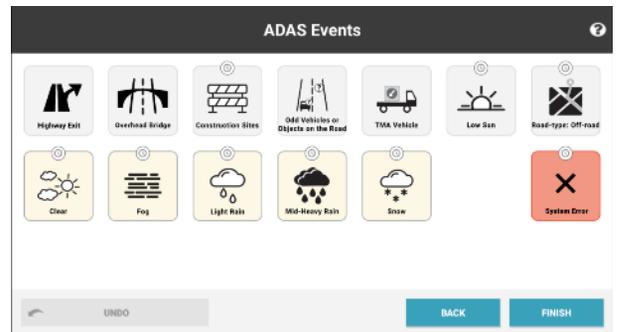


Fig.3.2 - AVL Digital Logbook – Event Tagging

Post-Processing

- Managing the captured scenarios in AVL RawDatabase, to which only data collecting partner have access (Safety Cage). For analyzing purpose (e.g. does the captured scene fulfill the defined criticality requirements) anonymized preview videos (no recognizable faces, no license plates) are made available to other project partners.
- The Data is further processed (data fusioning from multiple sensors, adding meta-data like weather information) in the AVL RawDatabase and anonymized raw data is made available to the project labeling partner.



Fig.4 - Anonymized Data available for other project partners [2]

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**VERIFICATION
VALIDATION
METHODS**



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[1]<https://confluence.vdali.de/display/VVM/Data+Collection+Drive+Description+-+Example>
[2]<https://github.com/understand-ai/anonymizer>

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