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OPENPASS

LONG-TERM GOALS
7TH AND 8TH OCTOBER 2020

OVERVIEW

BMW LONG-TERM GOALS

Theme	Epics	Userstories	Additional information
Motorway			
Rural			Automatically, when motorway and urban work
Urban	#1211, #1212		E. g. pedestian, bicyclist, traffic regulations, …
Measures for quality control			E. g. E2E-tests, build on further operating systems, …
Improvement of environmental conditions			E. g. time of day, weather, …
Ability of simple sensor effects			E.g. sensor degradation, sensor failure
Car2X			

BOSCH LONG-TERM GOALS

Accident re-simulation

- Agents follow pre-defined trajectories (e.g. GIDAS PCM)
- option for additional functionalities

→ International accident research

(e.g. Germany, India, China, ..)

Scenario-based simulations

Ego is challenged by scenario agents

- simulate defined scenarios
- option for stochastic variations
- basic driving functions (only?)

→ Functional & system development
→ Understanding of scenarios

Traffic"accident" simulations

- Agents generate traffic
- Agents cause accidents intrinsically (erratic driver behaviour necessary)
- (Ideally) no weighting

→ Future of accident research
→ Verification of future mobility solutions

Focus

DAIMLER LONG-TERM GOALS

V0.8	V1.0
Release review (devs)	openPASS "customer journey" (website ➔ tool ➔ docu...)
IP Log (devs)	
Re-integration PCM use case (ITK/Mercedes)	openPASS "ecosystem"
- **new PCM configs based on v0.7**	
- **new PCM Sim. Plugin ➔ writes configs**	"V1.0 quality": nice documentation & CI/build, nice structure, clean code, release review passed etc.
- **new accident trajectory follower (Agent Components)**	
- **PCM use case example configs (PCM case)**	
Update GUI plugin „traffic sim" (VWGoA)	Consolidated use cases (➔ aligned to "openPASS goals")
V0.7 use case example (BMW)	- Sce-based assessment
move to Gitlab (devs, TÜV)	- Accident re-simulation
1st CI steps (tbd)	- Virtual FOT
	Derived from that: commons for all use cases (experiment setup, example system for all..), good example configs, well documented examples
	V1.0 GUI plugins: road / scenario editor, 2D visualization, post-processing

ITK GOALS

There are no long-term goals of ITK.

V0.9

clean up AgentInterface (epic „#1225)

Clean up Documentation. (Epic #940)

Easy getting started for new devs(epic #1355)

V0.8

Get used to the PCM simulation, requirements for PCM (epic #1310)

PCM with cmake (epic #1353, no assignee yet)

Migration to GitLab (epic #1354)

Introducing CI (epic #1205)

TOYOTA AS USER MEMBER

Toyota is a user member and has no direct influence on OpenPass goals but wants to contribute with suggestions based on our involvement in on-going EU activities

BACKGROUND

- **State of the art regarding simulation of safety systems are commercial solutions or in-house developed solutions**

    - This is OK for internal use

    - These solutions are not very flexible

                - limited functionality

                - Solutions may not adapt quickly to rapid changing standards

                - No harmonised approach

      - Black box = This is probably not OK for third party assessment

- **Why should anyone use OpenPass instead of commercial solution or in-house solution?**

      - It should be OK for internal use
      - It should be flexible and adapt quickly to changing standards
      - It should be transparent

LONG-TERM GOALS

Focus 1: Third party-assessment

- Increased use of virtual testing for ADAS / AD by third party (ALKS R-157, AEB R-152, ENCAP VT)

    - Unclear approach by third party, but overall industry should aim at a solution that is **trusted and accepted**

    - **Standardisation:**

        o Scenario Database: OpenPASS shall be compatible with scenarios proposed and its format (link with ASAM) (v1.0)

        o Interfaces: OpenPASS shall be based upon existing and upcoming standards (OSI, FMI) (v1.0)

    - **Validation of results:** How can we and also third party rely on results from OpenPass?

    - Need balance between transparency and certain confidentiality level → How to handle?

LONG-TERM GOALS

Focus 1: Third party-assessment

Implement related scenarios to third party assessment (v1.0)

- ALKS R-157 (& upcoming)

- ENCAP scenarios (up to 2020 protocol) → If too much, need to prioritise

How to deal with ideal sensors?

- Short-term: Implement probabilistic model for sensor degradation? (v1.0)

- Long-term: Physical model → Link with on-going VIVALDI German projects (detailed SiL) (v2.0)

Relation to other open-source activities -> SUMO (Eclipse) & CARLA traffic simulator?

LONG-TERM GOALS

Focus 2: Internal use

- Safety effectiveness of ADAS / AD functions

    - Include different weather conditions (v1.0)

    - Baseline approaches and Simulation blocks in architecture to be aligned with on-going ISO WG7 activities (PEARS) (v1.0)

    - How to address mitigation?

        o Integrate Injury Risk Functions for accident re-simulation (v2.0)

    - Integrated safety -> Accident re-simulation Combination with Passive safety? (Long term vX.0 – May require link with other tools?)

- User friendly tool

    - Easy installation / usage (v1.0)

TÜV SÜD LONG-TERM GOALS

TÜV SÜD is a certification company. Certification methods are given by laws and regulations. There are not yet any laws on how to homologate autonomous vehicles or automated driving functions with virtual methods. Therefore, there is not yet any specific use case for openPASS for TÜV SÜD.

VW GOA – LONG-TERM GOALS

short	We want to…	Version	Epic
rateEFFECT comparable	have a physical behaviour of the driving dynamics (e.g. like PC-Crash). (e.g. tire models)	0.8	
	simulate all accident scenarios, which could have a PCM. (Independent of the format of the scenario)	0.8	
	have all road information (e.g. lane markings, traffic signs) from the world (PCM or openDRIVE) available in the simulation.	0.8	
Physics	simulate all possible accident scenarios.	1.0	
	have physical models for VRUs (pedestrians, cyclists, e-scooter).	1.0 / >1	1211 1212
	have all physical parameters (e.g. reflection coefficient, position of the sun) from the world available in the simulation.	1.0 / >1	
	influence the physical parameters (e.g. luminous intensity) on the way from the object surface to the sensors (e.g. due to fog, weather).	1.0 / >1	
System editor	use subsystems in the system editor and that this structure is understandable by the simulation core.	1.0	1214 1226
Visualisation	have a GUI plugin, which can visualize a run as a video and can export it to a standard format (e.g. avi, mp4).	0.8	1227

CATEGORIES AND PRIORIZATION 1.0

Quality:

Documentation for developers, docu for users, verification through automated testing, CI, refactoring third party dependencies

Usability:

customer journey, Installer, GUI compatible to core, example configs, post processing

Network:

Contribution guideline for third parties, release review, code of conduct

Features/ Product/ Technology:

physical behavior of driving dynamics, system editor (subsystems), integrating PCM

Capability scenario simulation:

environmental conditions, extend openSCENARIO support, extending support for FMU and OSI

SC:

communication to other open-source activities, alignment with ISO/ASAM activities, discussion on simulation approaches (e.g. PCM), evaluate the simulation capabilities for accident scenarios, concept of visualisation