OPENPASS WORKSHOP

ARCHITECTURE COMMITTEE, SINDELFINGEN, MARCH 28 2018

DRAFT GUI CONCEPT FOR OPENPASS

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VISION: OPENPASS DELIVERS OPEN SIMULATION FRAMEWORK FOR FULL EVALUATION OF ADAS/AD MODELS

VISION OF ACTIVE SAFETY EVALUATION. PROCESS AND ROLES.

Source: Multi-functional open-source simulation platform for development and functional validation of ADAS and automated driving, Lei Wang, Timo Vogt, Jan Dobberstein, Jörg Bakker, Olaf Jung, Thomas Helmer, Ronald Kates, Fahrerassistenzsysteme 2016
Goal of prospective evaluation of safety systems – independent of methods, data and tools:
What are the effects of safety systems and automated driving functions with regard to safety?

openPASS aims to unify various virtual assessment approaches on one platform:

- **Accident re-simulation**
  - Re-run reconstructed accident trajectories

- **Scenario variation**
  - Virtual test catalogue of complex multi agent scenarios

- **Traffic simulation**
  - Traffic model with driver behaviour as baseline risk
USE CASE „ACCIDENT RE-SIMULATION“ (PCM DATA => V0.5)

Goal: what-if simulation of reconstructed accident trajectories

Various in-house tools like rateEFFECT, PRAEDICO, CARS – now open source alternative based on openPASS

Status (v0.5):
- GUI 1: framework + flexible system editor to edit function parameters
- GUI 2: start window to select GIDAS cases, list of result values
- World: PCM line segments from sketches
- Basic agent model: trajectory follower + two-track vehicle dynamics and impact model

Next steps:
- Improve trajectory following behaviour (more naturalistic), add world features,
- GUI: Automatic result evaluation, dynamic animation

<table>
<thead>
<tr>
<th>Blue: open source; Grey: not yet available</th>
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<tbody>
<tr>
<td>PCM GUI: visualisation, animation, result statistics</td>
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<td>PCM GUI: start, PCM result list</td>
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<td>GUI: openPASS system editor</td>
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<td>Observer</td>
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<td>PCM World: line segments, global positions</td>
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<td>openPASS Master/Slave „single spawn point“</td>
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<td>Generic sensor / algo modules</td>
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<td>Baseline: import .mdb PCM data, driver: trajectory following =&gt; impact</td>
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**USE CASE V0.6**

**Goal:** configure, start & run scenario in xodr world

**Status (v0.5):**
- GUI 1: framework + flexible system editor to edit function parameters
- Further GUI plugins: simple start plugin in VW GoA commit
- World – new!: OpenDRIVE + OSI
- OpenScenario?
- Basic agent model: mini modules + ????

**Next steps:**
- Definition of baseline scenario (e.g. 3-lane motorway with curves, 10 vehicles per lane)
- Extension of agent modules (sensor, algo)
- GUI plugins:
  - configure scenario
  - Visualize / animate
- Evaluation plug-in

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**GUI:** visualisation, animation, result statistics

**GUI-plugin:** configure & start simulation in xodr world

**GUI:** openPASS systemeditor

**Observer:** simulationOutput?? xosc?

**NEW!**

**Xodr World:** openPASS Master/Slave „single spawn point“

**Generic sensor / algo modules**

**Baseline: scenario? driver??**

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SUMMARY OF NECESSARY NEXT STEPS TO DISCUSS

• GUI architecture: main windows vs. use case specific plugins
• „PCM use case“: open data format, evaluation, generic modules
• Virtual tool chain: integration with numerical sim. (HBM)
• „OpenScenario concept“ – how to implement?
• Open source driver model
• Roadmap to virtual assessment / “openPASS rating”