Implementation of an OSI World for openPASS

23.07.2018 – Reinhard Biegel
Overview

“A generic interface for the environmental perception of automated driving functions in virtual scenarios.”

- Provides data structures for:
  - Moving and stationary objects
  - Lanes
  - Traffic lights and signs
  - Environmental properties
  - Various structures for “detected” objects
  - ...
- Defines coordinate systems, datatypes for coordinate representation
- Based upon protobuf library → serialization included
- OSI Sensor Model Packaging (OSMP) describes structure of functional mock-up units (FMU), uses FMI 2.0
- Well documented
- Actively developed, everyone can create/comment on issues on GitHub

https://github.com/OpenSimulationInterface/open-simulation-interface
Import and conversion of scenery

• Input format: OpenDRIVE 1.4
• Lane-based representation of road network
• Simple use-case: Two lanes in same direction, segments: straight and clothoid-arc-clothoid

Spawning behaviour

• Spawning with $v = \text{const.}$, std. dev.
• Lane randomly chosen
• Despawn when leaving the road

Driver

• Driving along lane with $v = \text{const.}$
• Extension: Adapt speed to vehicle in front
• No lane changes

Proposed features for first implementation
Roadmap

- Static objects
- Traffic signs
- Roadmarkings

February 2018: OpenDRIVE Importer
March 2018: OSI extension
April 2018: openPASS adaptation
May 2018: OSI extension release/PR
June 2018: World_OSI release
Roadmap

- Roads, Sections, Lanes
- Writing converted scenery data into OSI structures
- Minimum world-representation in openPASS

February 2018
OpenDRIVE Importer

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OSI extension

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openPASS adaptation

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Roadmap

- Localization of Agents in road-coordinates
- Implement World-/AgentInterface
- Simple spawnpoint
- Simple driver model

February 2018
OpenDRIVE Importer

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openPASS adaption

May 2018
OSI extension release/PR

June 2018
World.OSI release
Roadmap

- OSI Pull-Request + discussion
- Implement World-/AgentInterface
- Localization
- Driver „cruise control“ extension
Roadmap

- Implement World-/AgentInterface
- Release of World_OSI

February 2018
OpenDRIVE Importer

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July 2018
World_OSI release
Complete the implementation of current interfaces

- AgentInterface
- WorldInterface

Handling of intersections

- Currently only a single road is supported
- Conversion has to be implemented
- Localization has to be adapted

Future development
Thank you for your attention