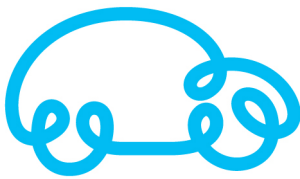


Dream-like simulation abilities for automated cars



DREAMS4CARS

Grant Agreement No. 731593

Deliverable: D5.1 – Test Plans, Methods, and Metrics

Dissemination level: CO – Confidential

Delivery date: 26/June/2018

Status: Final



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731593

Deliverable Title	Test Plans, Methods and Metrics		
WP number and title	WP5 Agent evolution, evaluation of ability levels and final assessment of the technology		
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Creation Date	30 November 2017	Version number	1.0
Deliverable Due Date	30 June 2018	Actual Delivery Date	26 June 2018
Nature of deliverable	X	R - Report	
		DEM – Demonstrator, pilot, prototype, plan designs	
		DEC – Websites, patents filing, press&media actions	
		O – Other – Software, technical diagram	
Dissemination Level / Audience		PU – Public, fully open	
	X	CO - Confidential, restricted under conditions set out in MGA	
		CI – Classified, information as referred to in Commission Decision 2001/844/EC	

Version	Date	Modified by	Comments
0.1	December 11 th , 2017	Andrea Saroldi	First draft for discussion
0.2	March 23 rd , 2018	Andrea Saroldi	Review after project meeting in Bremen
0.3	March 29 th , 2018	Mauro Da Lio	Revision and extension of document. Scenarios wake-dreams cycles for project phase 2.
0.4	March 31 st , 2018	Christian Koch, Elmar Berghöfer	More details in Section 2.1 and comments in Section 3.
0.5	June 12 th , 2018	Andrea Saroldi	Overall review.
0.6	June 15 th , 2018	Elmar Berghöfer, Christian Koch, Fabian Maas	Last comments and refinements.
0.7	June 18 th , 2018	Andrea Saroldi	Overall review.

0.8	June 22 th , 2018	Felix Bernhard	Added DFKI safety Concept in 8.1.
0.9	June 25 th , 2018	Andrea Saroldi	Implementation of Peer Review change requests.
1.0	June 26 th , 2018	Mauro Da Lio	Final version for submission.

EXECUTIVE SUMMARY

The goal of the Test Plans is to accompany the development of the artificial driver Agent by providing the necessary data needed to feed its evolution, and, at the same time, assess the improvements in the performances along its evolution. This is a critical task, in order to obtain an artificial driver Agent that is grounded on the way the real vehicles, roads, and traffic behave in the real world, even if the training is mainly done in simulation environment. In a similar way, the performances of the system have to be measured and improved in a direction that is useful for real-life situation, through the definition of appropriate evaluation metrics.

For this purpose, different kind of tests with different goals are performed along the progress of Dreams4Cars project in different test environments. This document describes the various types of planned tests, evaluation metrics and safety procedures adopted to accomplish these goals.

One main categorization for the experiments concerns their purpose: 1) some experiments serve to produce the “wake state” observational data that are the seed of dreams; 2) other experiments are validation tests.

The former (experiments to set up the observational data) are carried out with the real car and can be divided into:

- a) Experiment for building internal models of the vehicle dynamics that will be used as described in Deliverable D3.1 on “Simulation System (release 1)” [3] section 6 for vehicle control and low-level motor planning;
- b) Experiments for building episodic simulations (such as events, other users’ intentions, etc.) following the lines described in D3.1 sections 3 and 4.

The latter (validation experiments) are carried out in three different types of environments (Software in the loop, Hardware in the loop and real car) and address:

- a) Quality assurance tests, including standard Euro NCAP simulated tests.
- b) Tests to assess the fidelity of simulations.

The evaluation metrics (for all types of experiments) are given in general terms in section 6. Examples of these metrics declined to specific types of simulations are given in D3.1 (sections 3 and 4).

The plans for all these tests are given, specifying which tests will be performed, for which test vehicle or simulation environment, and who will be driving (human or artificial driver). Finally, the safety procedures are defined (and the limitations that the plans had to take into account) for both DFKI and CRF.