Dream-like simulation abilities for automated cars

DREAMS4CARS

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	X	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	April 30th, 2018	Andrea Saroldi	First draft for partners.
0.2	Mai 31st, 2018	Elmar Berghöfer	Adding chapter describing DFKI vehicle.
0.3	June 5th, 2018	Andrea Saroldi	Harmonisation with D5.1.
0.4	June 8th, 2018	Andrea Saroldi	Overall update.
0.5	June 14th, 2018	Riccardo Donà	Lateral control section added.
0.6	June 18th, 2018	Andrea Saroldi	Version for Peer Review.
0.7	June 20th, 2018	Mehmed Yüksel	New pictures of MIA have been added, version merged.
0.8	June 26th, 2018	Andrea Saroldi	Implementation of Peer Review change requests.
0.9	June 27th, 2018	Elmar Berghöfer	Final checks and additions to the review.

1.0	June 27th, 2018	Mauro Da Lio	Final version for submission

EXECUTIVE SUMMARY

The deliverable describes the test vehicles developed by DFKI and CRF for Dreams4Cars project, adapting and extending test vehicles available from previous projects. They serve to log data from the real world (for dreams instantiations) and to test the developed autonomous driving functions in real life situations. The adaptation and use of two Test Vehicles in the project is needed to verify the portability of the driver Agent on different vehicles, with different dynamics and configuration of sensors and actuators.

DFKI test vehicle is implemented on an electric vehicle, called Mia, while CRF test vehicle is implemented on a Jeep Renegade. Both vehicles are equipped with different sensors (redundant in the Mia car), processing units, and actuators to collect data from the environment, merge the information in a description of the scenario, host the driver Agent developed in Dreams4Cars, and control the vehicle by acting the manoeuvre given by the driver Agent; vehicles are also equipped with logging tools and implement safety rules to reduce the risk level.

The deliverable describes the sensors used to detect obstacles, lane markings, and get absolute vehicle position; the processing units adopted, the actuators used and the system architecture used to control vehicle motion.

For CRF, vehicle tests are preceded and integrated by tests in two simulation environments called Software in the Loop (SIL), and Hardware in the Loop (HIL). These three test environments are used to evaluate performances of the Dreams4Cars driver agent according to Quality Assurance methodology; also, the HIL test environment can be used to efficiently generate complex and critical scenarios.