

Review of Diploma Thesis

Simulation of AEB System Testing

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Reviewer: Ondřej Vaculín

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Criteria assessment

Topic of the thesis

complicated

The simulation of ADAS systems is a rather complex topic, because the simulation engineer must cover different modelling areas such as vehicle dynamics, sensors, decision algorithms and finally surrounding traffic. Despite specialized simulation tools offer significant support to the simulation engineers, the role of the engineer is significant also in the interpretation of the results.

Fulfilment of the thesis objectives

fulfilled with objections

The objectives of the thesis are generally fulfilled. However, the description of the interface between IP Carmaker an Excel is underrepresented and does not give the full picture. The reviewer would appreciate to put more emphasis to demonstrate that the objectives were really fulfilled.

Chosen approach

right

The author has got familiar with the simulation environment IPG Carmaker and approaches to the simulation of ADAS systems. He used some demonstration models and implemented the scenarios. It would be of an advantage if the author took less scenarios and preformed the analysis of these scenarios and their results more in detail.

Professional level

D (satisfactory)

The work indicates that the author can work independently and can correctly apply the knowledge gathered from literature and training. He implemented many scenarios in IPG Carmaker and performed simulations. The selection of parameters is usually a very crucial point of any simulation study. More argumentation about the selection would give more insight for the reader. The analysis of the simulation results is rather weak as well. Some figures with results have scales, which cannot give the reader the right information.

Formal and language level, extent of the work

C (good)

The reviewer has slight objections to the structure of the work, because it contains just 4 chapters. Furthermore, their extent is very variable as well as the level of detail. In some cases, the author uses probably advertisement texts (e.g. Carmaker description).

Selection of sources, correctness of references

C (good)

The thesis contains 37 references mainly from internet sources. It is a pity that the reader finds many obviously adopted statements without citations of relevant sources.

Overall assessment questions and proposal of the classification

The diploma thesis consists of 76 pages and CD with simulation models and results. It is divided into 4 chapters. The first chapter presents on 18 pages the state-of-the-art of advanced driver assistance systems (ADAS) systems and touches also sensors and modelling. The second chapter is focused on brief description of some software tools for simulation of ADAS systems. It has only 5 pages. The third chapter contains the description of scenarios, its parametrizations and the simulation results, which are main the author's engineering work. It has 35 pages. The thesis is concluded in Chapter 4 (1 page). The reviewer considers the division into just 4 chapters as rather unlucky.

Overview of simulation tools is rather brief, some important simulation tools such as PreScan, TESIS Dyna4 or general MBS tools with ADAS capability are missing.

The thesis suffers from the vast number of scenarios. The reviewer is missing discussion on simulation results. It would be of an advantage if the author took less scenarios and preformed the analysis of these scenarios and their results more in detail. Similarly, more detailed description would be expected in the case of the interfacing, which was one of the objectives of the work.

The reviewer has the following questions:

Q1: Author presents two simulation models in Carmaker environment and its parameters in Chapter 2. How many bodies and how many degrees of freedom do the mechanical models have? How many additional dynamic states are introduced to describe the AEB systems and their control?

Q2: What is the reason for the acceleration peaks in Figure 3.29? In the same Figure: Why do you choose the time to collision range from -10 000 to +40 000 seconds?

Q3: How important is it for the given objectives of the work, that IPG Carmaker is a real-time simulation tool as stated in Chapter 2 (p. 32)? In which cases is the real-time capability important?

It can be stated that the author has demonstrated that he is capable of independent engineering work. The reviewer recommends the master's thesis for the defense.

Proposed classification of the master's thesis

D (satisfactory)

Date: 20.09.2017

Signature:

