

I. IDENTIFICATION DATA

Thesis name:	Optimisation of ADAS - AD Validation Process
Author's name:	Danielle FOTSO
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automotive, Combustion Engine and Railway Engineering
Thesis reviewer:	Ondřej Vaculín
Reviewer's department:	Technische Hochschule Ingolstadt, Faculty of Electrical Engineering and Computer Science, CARISSMA – Vehicle Safety Research Institute

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The thesis is focused on improvement of the validation chain for ADAS/AD and particularly on approaches for generation of testing scenarios for advanced drive assistance systems at PSA. This is an open item in the validation chain, because no commonly accepted solution exists.	

Satisfaction of assignment	fulfilled
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
The reviewer can state, that the assignment seems to be fulfilled despite it is on one hand rather general and on the other hand defines the methods to be applied.	

Method of conception	partially applicable
<i>Assess that student has chosen correct approach or solution methods.</i>	
The method is actually defined in the assignment. The author correctly implemented the method for the selection of the test cases; however, it has been presented just with a very complex example. In order to document the functionality of the method, it would be of big advantage to present the functionality on a 3D example including graphs showing the selection of test cases in simply imaginable dimensions. The correlation of the thesis to its beginning is unclear. The description of the PSA brands and structures of PSA departments is irrelevant. The relation of the developed method to the functional safety and SOTIF is not clearly described in the thesis.	

Technical level	C - good.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
The author writes that the chosen scenarios have been implemented in the HIL bench. The reviewer would highly appreciate to see some statistics and particularly how many of the scenarios was generated. The generation of scenarios usually concentrate on the critical scenarios, which are on the border between the fulfilment of the acceptance criteria and their violation. The most important for the understanding of the approach seems to be the Appendix 2 – Parameter classification. If transforming the presented approach to the approach defining functional, logical and concrete scenario, this is somehow the description of the logical scenario, despite the scenario itself is actually very broad. From such a scenario description and parameter intervals (which are not well understandable in the thesis) and probabilities of parameters and definitely the knowledge of the behavior of the system under test, the critical combination of the parameters should be found.	

Formal and language level, scope of thesis	C - good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
The reviewer was confused about the difference in the assigned and real title of the master thesis.	

The formal level is good. Numbering of equations is missing and the references in the equation line are not usual. Also some misprints can be found in the thesis and the author should decide and consequently use either "Figure" reference with a capital or small "F". Mixing of both is not acceptable.

Selection of sources, citation correctness

E - sufficient.

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The author cites According to the reviewer's opinion, citation of internal PSA documents is not a good idea for the public master thesis.

In the case of internet citations, the information on the access should be rather written in English than French.

In many cases it is difficult to distinguish between first name and family name; however, the author should verify it e.g. using Google. E.g. Professor Dr. Volker Schmidt cannot be cited as "S. Dr. Volker". Same mistake has been indicated in more citation. It means that the whole section with references is rather unusable.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

In general, the mater thesis presents some method for the automation of ADAS testing as well as related results; however, the presentation particularly of the results is rather unconcrete.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

The objectives of the thesis were fulfilled. The author has proven to be an independent engineering work. The work does look less compact, has some parts which are irrelevant, contains many formal mistakes and the results are not fully described.

Reviewer would like to ask following questions:

1. How many dimensions your parameter space does have?
2. What are the examples of the acceptance criteria for your test cases?
3. 5000 scenarios is generated using the author's approach without any knowledge of the system to be tested. Do you know how many of them are safe, unsafe and particularly how many are critical for a particular case implemented in the HiL bench, i.e. they are in the neighborhood of border defining the fulfillment of the criteria?
4. Why do you need to drive longer distance to validate the ADAS systems (Table 1 – 4.8 108 km for ASIL A up to 4.8 1010 km for ASIL D for just 70 % confidence level) than the AD systems (Section II.2 - approximately 108 km)? Does it mean that the AD System has lower ASIL than A, ie just QM? What is the confidence level in the AD case?

I evaluate handed thesis with classification grade **C - good**.

Date: **26.8.2019**


Signature: