

Opponent's review of a bachelor thesis

Title in English: Modelling of Electric Drive and Vehicle Dynamics for Hardware-in-the-Loop Testing System

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Field of Study: Electrical Engineering, Power Engineering and Management

Subfield: Applied Electrical Engineering

University: Czech Technical University in Prague, Faculty Electrical Engineering

a) Introduction

The described thesis was done in cooperation with Porsche Engineering Services GmbH. The elaborations of the technical aspects were made with the Hardware-in-the-Loop Equipment of the Porsche inverters. Parts of the thesis are built upon existing software models and hardware, which are property of Porsche.

b) Goals of the bachelor thesis and their implementation

- a. Analysis of matlab model two-wheel vehicle dynamics
- b. Extend the existing two-wheel to all-wheel drive model
- c. Create and verify a simplified battery model for electric vehicles
- d. Connect and include resulting models into Labcar simulation software
- e. Create new Labcar GUI ajar currently developed electric vehicle
- f. Verify of all, during this thesis resulted, models

c) Formal

a. Layout and speech

The linguistic level of the thesis is very good and all explanations are well understandable. Formal and graphical style is on a high level, figures and graphs are done precisely. The thesis is logically divided into six chapters.

b. shortcomings

Figure 1.1 – source is not referenced

Figure 2.1 – source is not referenced

Figure 2.2 – source is not referenced

Figure 2.3 – source is not referenced

In chapter 1.1, 3.1 and 6.2 the personal pronoun is used

d) Possible questions:

- a. How do you ensure the mechanical bonding of the two axles in the all-wheel-simulation?
- b. How have you simulated the power electronic and motor for front axle?
- c. In Figure 3.14, you show the comparison of driving torque on rear PMSM between simulated and real measured torque. Can you explain why there is sometimes a big difference between those?
- d. How have you verified the intermediate circuit simulation?

e) Conclusion

I can come to the conclusion, that the present thesis is done on a high level concerning the technical and writing aspects.

I evaluate handed thesis with classification grade B – very good.

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