REVIEWER'S OPINION OF FINAL THESIS

I. IDENTIFICATION DATA

Thesis name:	**Sensorless Field Oriented Control of a Brushless DC Motor**
Author's name:	**Byron Pitsillis Schutte**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Circuit Theory
Thesis reviewer:	Ing. Jan Bauer Ph.D.
Reviewer's department:	Department of Electric Drives and Traction

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**challenging**
Evaluation of thesis difficulty of assignment.	
Aim of the thesis is to design both HW and SW part of BLDC controller	

Satisfaction of assignment	**fulfilled**
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.	
All point in the assignment have been fulfilled.	

Method of conception	**correct**
Assess that student has chosen correct approach or solution methods.	
Thesis begin with theoretical survey, then focuses on practical implementation.	

Technical level	**D - satisfactory.**
Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.	
I have found many inaccurate wording and technical mistakes in the text, which decrease quality of the thesis. Chapters dealing with the control strategy of the BLDC summarizes only general theory and does not deal with FOC in detail. I am not sure whether author is omitting current feedback loop as a mistake or as clearly known thing. I totally disagree with the results of the chapter 8. Either were wrongly selected test sequences or results are poorly explained.	

Formal and language level, scope of thesis	**B - very good.**
Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.	
Figures in the thesis have good quality, are legible. Last chapter of the thesis seems like it has been written in hurry, because there are formulations like "Fig. xx" in text, moreover measured waveforms are not properly labeled "Vt, Vm" (Fig. 42, Fig. 43) or "Ae, Am" (Fig. 49, Fig. 50).	

Selection of sources, citation correctness	**A - excellent.**
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.	
References are selected well and are cited in the text too.	

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.
Please insert your commentary (voluntary evaluation).

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.

Presented thesis show that author has to deal both with HW and SW part design. I must state that the author did a piece of work and demonstrated the ability to apply theoretical knowledge in practice. Based on figures presenting PCB I can conclude that he has fulfilled HW part well. However, chapters dealing with the SW part are much weaker. Results presented in chapter 8 can not be taken as successful tuned control for electric drive. I am missing some own criticism and more thinking about improvements in conclusion chapter.

I have several questions:

1) Why FOC? There are many other strategies for BLDC motors that give better performance.
2) Explain in detail shapes of measured velocity? What is source of "fluctuations"?
3) Explain sinusoidal shape of voltage presented in Fig. 46 and Fig. 47. Are the scales correct? Show parameters of transistor used as switch in inverter.
4) What was the source of estimated angle misalignment in Fig. 49 and Fig. 50.?
5) Explain meaning of negative deadtime in Fig. 4. How does it correspond with sentence above, that excessive heat will occur in the switching components?
6) Explain sentence in conclusion "Triggering the ADC with hardware interrupts could speed up current readings". How were ADC triggered?

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

Date: **23.8.2021**   Signature: