

## I. IDENTIFICATION DATA

<b>Thesis title:</b>	<b>Sensorless Field Oriented Control of PMSM Based on STSPIN32G4</b>
<b>Author's name:</b>	<b>Bc. Šlehofer Kristián</b>
<b>Type of thesis :</b>	master
<b>Faculty/Institute:</b>	Faculty of Electrical Engineering (FEE)
<b>Department:</b>	Department of Measurement
<b>Thesis reviewer:</b>	Ing. Stanislav Tomášek

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b>	<b>extraordinarily challenging</b>
<i>How demanding was the assigned project?</i>	
The assignment required for a theoretical treatment and a practical development of a sensorless motor control algorithm usable for permanent magnet synchronous motor(s). This task requires sizable knowledge in many areas of electronics, ranging from control theory, system modeling, electric motor theory, power electronics, micro-controllers and assorted programming to name the most important ones. With this I classify the assignment as "extraordinarily challenging".	

<b>Fulfilment of assignment</b>	<b>fulfilled</b>
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
All goals of the thesis' assignment were accomplished. The theoretical treatment of the subject provides with a necessary background for control method development, the implementation and testing phases followed which were completed both in simulation and demonstrated with a setup on a real PMSM.	

<b>Methodology</b>	<b>outstanding</b>
<i>Comment on the correctness of the approach and/or the solution methods.</i>	
Described methodology is correctly selected and perfectly executed on solving the thesis' assignment. Joining theoretical basis of the designed control strategy with practical implementation and demonstration endows the thesis with real-world application.	

<b>Technical level</b>	<b>A - excellent.</b>
<i>Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?</i>	
The presented results affirm to the technical quality of the thesis. Author has clearly applied gained knowledge in his studies and went even further from his field of study. By delving even into the hardware of the setup the author has shown breadth of his expertise. Description of the work is clear with some minor inaccuracies which do not significantly impact the overall thesis' quality.	

<b>Formal and language level, scope of thesis</b>	<b>A - excellent.</b>
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
Submitted thesis utilizes concise language with logical flow of text which gives a clear view of performed work. Equations and symbols are correctly formatted and described in the text. Most of the drawings are in vector format which amplifies quality of the thesis. Use of TeX typesetting is also a positive factor for thesis' presentability. English is without any significant typos or grammar errors.	

**Selection of sources, citation correctness****A - excellent.**

*Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?*

The author gives ample references to prior art in MRAS control methods, motor control theory and strategies in general. References to documentation of used tools and devices in the implementation are also provided for further study. The primary distinguishing factor is application of the developed algorithm on the real hardware with its implementation described which sets this thesis apart from most of the available texts. The bibliography itself conforms to the citation standards.

**III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE**

The thesis successfully presents design, development and practical testing of MRAS-based sensorless control of permanent magnet synchronous motor. The assignment was successfully fulfilled and the presentation of the completed work gives an excellent overview of taken approach.

As for the questions I would like the author to suggest a method of automatic control-critical motor parameters acquisition/measurement with current hardware. A simple subroutine flowchart with discussion at the defense will suffice.

With the qualities of the thesis described above I award the author with highest grade possible **A - excellent.**

Date: **2.6.2024**