

I. IDENTIFICATION DATA

Thesis title:	Nonlinear Predictive Control of Unmanned Aerial Vehicle in Environments with Obstacles
Author's name:	Jan Hřebec
Type of thesis:	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis reviewer:	Robert Pěnička
Reviewer's department:	Department of Cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>How demanding was the assigned project?</i>	
I consider the assignment challenging given its target of using new solver of Nonlinear Model Predictive Control with additionally modeled obstacles on simulated and optionally also real quadrotor aerial vehicle.	

Fulfilment of assignment	fulfilled
<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>	
To the best of my knowledge the thesis assignment is fulfilled.	

Activity and independence when creating final thesis	C - good.
<i>Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.</i>	
While the student is theoretically excellent, he had last-minute approach to majority of the work. The student regularly consulted his work, yet several negotiated time limits (mostly the text-writing and experiment evaluation) were not met. This had impact on the final thesis as no time was left to not only answer how good the proposed methodology works but why it works as it works, e.g., compared to other methods. On the other hand, the student had quite positive approach to the implementation part of the thesis.	

Technical level	A - excellent.
<i>Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?</i>	
I consider the thesis to be technically correct with clear explanation of the work.	

Formal level and language level, scope of thesis	B - very good.
<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>	
The thesis is formally correct and written in readable English language. The only limitations towards its scope is the limited explanation and discussion of the achieved results due to the last-minute approach to experimental evaluation.	

Selection of sources, citation correctness	A - excellent.
<i>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?</i>	
The work cites adequate references to its topic with correct bibliographic standards.	



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

In overall, I consider the thesis to be a valuable contribution that shows possibility of modeling obstacles in selected Nonlinear Model Predictive Control solver while keeping computational time within control period of the employed aerial vehicle. Moreover, the implemented NMPC was integrated into the drone system of the MRS group and even tested on a real quadrotor. On the other hand, the student's last-minute approach to the thesis writing and experiment evaluation impacted the final thesis that could have had otherwise bigger impact with better fine-tuning and reasoning about the achieved experimental results. **Therefore, the grade that I award for the thesis is B - very good.**

Date: **1.6.2023**

Signature: