

OPPONENT'S EVALUATION OF THE BACHELOR'S THESIS

Student: Asadullah Tariq

Opponent: doc. Ing. František Gazdoš,
Ph.D.

Study program: Applied Informatics in Industrial Automation
Specialization: Intelligent Systems with Robots
Academic year: 2024/2025

Bachelor's Thesis topic: Development and Optimization of an FPV Freestyle Drone for Aerial Manoeuvres

Evaluation of the thesis:

The student chose a challenging and ambitious task - to design, build and optimize an FPV (First Person View) freestyle drone, which involved complex knowledge from mechatronics, through signal and image processing, programming, to designing and fine-tuning a suitable control system. The topic thus fits into the field of study and is highly topical, as similar problems are currently being addressed by a number of companies and departments around the world, with potential applications in the military and civilian sectors. The thesis is written relatively readably and has a clear structure with a minimum of grammatical or technical errors but occasionally some occur, e.g.

- „...ensuring minimal LEG while retaining good video quality...“,
- double parentheses used for citing the references,
- positive feedback in the control scheme of Fig. 15,
- illegibility of some Figures - e.g. Fig. 34 – PID Tuning, but also 35, 36.

On the other hand, the scope of the work, including references, is quite extensive for a Bachelor's degree – 84 pages, 36 cited sources and 4 appendices. Furthermore, it can be stated that all points of the assignment were generally fulfilled, but for some it is not clear to what extent - see questions and topics below to be discussed during the defense. In conclusion, it can be stated that the work generally fulfilled its relatively ambitious goals and the student demonstrated relatively good knowledge of his field of study during its elaboration, therefore I recommend this work for defense and rate it with a grade of C – good, however, I would like the student to answer and comment appropriately the following questions and issues during the defense:

- according to the videos attached, it is clear that the drone is able to take off vertically upwards and then descend downwards, but it is not clear whether it is also able to land (safely); if possible, please provide at least a video demonstration;
- student also states in his thesis that he tested the drone in more complex maneuvers, such as “sharp turns, flips, and fast climbs”, but nothing of this kind is visible in the videos; again, if possible, present at least a video demonstration;
- it is also not clear from the work whether the student succeeded in his original intention - i.e. the design of an FPV (First Person View) drone - again, please, if possible, at least provide a video demonstration that the chosen HW can be used to monitor the flight of a drone from its perspective in real time;
- implemented PID controller has fixed setting, or does it change its settings adaptively according to the current flight modes?
- estimate the cost and time invested to develop the given drone.

Overall evaluation of the thesis:

The Opponent shall grant a mark according to the ECTS classification scale:

A – Excellent, B – Very Good, C – Good, D – Satisfactory, E – Sufficient, F – Insufficient

An “F” grade also means “I do not recommend the thesis for defence.”

I recommend this thesis to be defended and suggest the following evaluation:

C - Good

In the case of an evaluation grade of “F – Insufficient”, please supply the main shortages and reasons for this assessment.

Date: 4. 6. 2025

Thesis Opponent's Signature: