CZECH TECHNICAL UNIVERSITY IN PRAGUE
Faculty of electrical engineering
Department of electrical power engineering
Technická 2, 166 27 Prague 6, Czech Republic

Bachelor thesis supervisor's review

Master thesis: Impedance-meter for quantification of ethanol content in liquid solutions

Author: Arkady Vainshtein

Thesis supervisor: Doc. Ing. Mattia Butta Gonzales, Ph.D

	Rating (1 – 5) (1 = best; 5 = worst):
1. Fulfillment of assignment requirements:	1
2. Self-reliance and initiative during the thesis solution:	1
3. Systematic solutions of individual tasks:	1
4. Ability to apply knowledge and to use literature:	1
5. Collaboration and consultations with the thesis supervisor:	1
6. Thesis formal and language level:	2
7. Thesis readability and structuring:	1
8. Thesis professional level:	1
9. Conclusions and their formulation:	1
10. Final mark evaluation (A, B, C, D, E, F):	A
verbal:	Excellent

Brief summary evaluation of the thesis (compulsory):

Mr. Vainshtein is the typical student who arrives at the end of his bachelor with a lot of knowledge from all the courses he successfully attended but zero experience in designing and putting things together to make them work. That's why one day he came to my office and begged me to teach him how to use a soldering iron. And design a PCB. And posibly to make something meaningful with both of them.
As a task I told him to design a simple device to measure the content of alcohol in liquid solutions. The idea was to use a cheap IC to measure the impedance between two pads and use the impedance of the solution as a indicator of the content of alcohol.
First Mr. Vainshtein has diligently studied the dependence of the impedance on the alcohol content calculatign the optima frequency to maximise the resposnse and then he designed a PCB with the IC for digital measurement of impedance. During this phase he has shown independency in self-learnig new skills. Which means, I typically told him „learn how to use Kicad to design a PCB" and he was able to find some tutorial on the internet and learn by himself without need of too much of my help. Which is basically what you mostly want in an engineer.
He then soldered all the components of the PCB and tested the resulting device. He also programmed all the code for the microcontroller wich governs the PCB and shows the results of measurement on the

display.
In a nutshell, I am satisfied because he has shown independency in learning different skills, from design and manufacturing of a PCB to programming of microcontrollers, without need of continuos assistance. Therefore, I think he is going to be a good engineer.
Of course, he has also made mistakes. For instance he overlooked some details in the datasheet of the sensor of temperature and therefore he had to make some „adjustment“ of the PCB on the fly. But this is normal for the first designs. Once he will get experience he will learn to pay more attentions to these details.
What I had mostly to help him with, what to keep focused on the main goal of the project. Often he started making some experiments and tests which were surely interesting, but they could easily bring him away for the final goal (those tests you make if you have 2 years of time to work on a project, not one month to finish your thesis). From this point of view he still needs some direction from a supervisor to optimize his time on the most important activities.
The only thing I can complain about is the style of his writing in the final thesis. Too much colloquial. I preferred a more technical writing. But I guess it is just a matter of taste.
Overall I am very satisfied about his results and his dedication (he really worked hard, sometimes he stayed till late evening in the lab).

Date: June 9th, 2023 Signature:

Notes:

1) The total thesis evaluation needn't be determined by the partial evaluations average.
2) The total evaluation (item 8) should be from the following scale:

excellent	very good	good	satisfactory	sufficient	insufficient
A	B	C	D	E	F