

Review of bachelor thesis supervisor

Thesis title: Robotic eaves cleaner

Author: Drin Grapci

Study program: Bachelor of Mechanical Engineering / Information and Automation Technology

The goal of the bachelor thesis was to design and build a robot for cleaning eaves from dirt and debris. The robot should be able to climb autonomously through the vertical pipe and should be adjustable to different pipe diameters. The specific goals were:

- 1) Mechanical design
- 2) Selection of motors or servos, eventually sensors for the robot
- 3) Assembly and experimental validation of the robot

The student began his work with a review of similar devices on the market. He also described the parts and possible configurations of the eaves. This has limited the parameters for the robot.

The text of the thesis is in many places very generic, without focusing too much on what the student has actually done, what is his own work and result. For example the „introductory review“ is about 20 pages long, the robot design, 3d printing and assembly chapters are 17 pages long. So the „introduction“ is shorter than the actual construction part.

The final assembly of the model is documented only on the exploded view of the final assembly. There is no photo of the robot in the thesis. The student documents only one segment of the robot. The whole robot is not shown. As the student write himself in the conclusion *„I could not assemble the protorobot, however with access to a 3d printer at a later time, I hope to continue working on this project and eventually testing the functionality.“*. Therefore it is very questionable whether the student has actually fulfilled task 3) 1) Assembly and experimental validation of the robot.

The thesis contains a description of the electrical components, an Arduino was used. However there is no section about the code that is steering the robot. How is the robot controlled?

In general, the text of the thesis does not leave a good impression on the reader. It looks like it was written at least in part when the time was lacking, and that the student has not even looked at the pdf he has created. For example, why is table 3 distorted in the thesis? Also the thesis does not present any results except the exploded view and photos of the one segment. No measurement is presented, no experimental result.

When the student began working on the thesis, he was quite active for the first few months. We had regular online talks, almost every week. At that time, he was working well. He

was given a time schedule, what should be done when. For example, I told him several times, that the 3D models should be finished in approximately June, so that he has enough time for the assembly, testing and eventually some changes in the design. Unfortunately, his activity declined rapidly. He finished the 3D model not in June, but in November, so he had only very little time to complete. Despite the initial good activity of the student, his activity in the later stages was miserable. He did not show any progress for several months. His hectic activity, few days before the deadline, could not save the result, which is not good.

Due to the lack of experimental validation, I evaluate the thesis with grade „E - sufficient“.

Questions and requests:

- Explain the functionality of your Arduino code
- Bring the build robot to the thesis presentation and show it

Doc. Ing. Martin Novák Ph.D. – thesis supervisor

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