

Opponent's review of bachelor thesis

Thesis title: Distributed Control of an Array of Light Sources
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Thesis opponent: Ing. Michal Sojka, Ph.D.
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The reviewed work was not a traditional bachelor project, where the student is given a specific assignment. In this case, the assignment was more of an abstract idea and the student should develop it to more tangible form.

The thesis is divided into two almost independent parts. The first part describes the design and development of an experimental platform. It discusses several possible ideas of how an element the platform could be constructed and then proceeds with a description of the selected approach. The second part describes a mathematical model of one element of the platform.

The thesis is written in English. The text is quite understandable, although sometimes, the author uses Czech-inspired word ordering or incorrect prepositions. The text is accompanied with many figures that clarify the described items. The style of the text is (especially in the first part) more like a narrative rather than technical document. I would prefer to structure every section like this: problem description, possible solutions, details about the selected solution. Related to that, the author often reasons about various things without any reference to the literature. It seems like that a lot of the encountered problems are already solved (e.g. properties of coil magnetic field) and the author was just reinventing the wheel. I was also not happy about the extensive use of footnotes as they distract users. Another, a more specific comment is that the author calls the Autodesk 123D Design *free software*. This term is usually used for software licensed under an open source license, which is not the case here.

My biggest criticism of the work is that both parts are somewhat unfinished. The first part ends with pictures of the assembled module, but there is no single experiment proving that at least some parts of it actually work. Similarly, the mathematical model developed in the second part was implemented in Simulink, but no simulation was performed to show that the model is not completely wrong. Even if the identification of the real device was not performed, the author could put in some dummy numbers just to see whether the model behaves like a pendulum. Overall, I would prefer if the scope of the thesis is smaller, but the things are more finished.

I'd like to ask the author the following question:

- Why did you select the L298N H-Bridge even if it cannot supply enough current to the coils?

To summarize, the author performed a lot of work. He has proven that he can design and build an electro-mechanical device and, at the same time, derive a mathematical model of the device dynamics. The thesis, however, does not show that these results are usable as intended. For this reason, I rate the thesis just as **very good** (B).

In Santa Clara, CA, June 13, 2016

Ing. Michal Sojka, Ph.D.