

## REVIEW OF MASTER'S THESIS - SUPERVISOR'S COMMENTS

**Author of the master thesis:** Phaneendra Mantada

**Name of the master thesis:** Accuracy Analysis of Additive Manufacturing of 3D Printer Using Optical Digitization

**Supervisor of the master thesis:** Ing. Radomír Mendřický, Ph.D.

The aim of thesis was to analyse the accuracy of different 3D printers. For the assessment of the dimensional and shape accuracy of produced models was used contactless measurement methods.

The introductory theoretical part, the author describes the process of additive manufacturing of parts and various 3D printing technology (FDM, PolyJet, SLS, SLA) used in the thesis for production of models. The theoretical part of the thesis is appropriately chosen with respect to the topic and I have no more serious comments in addition to the missing search of published research papers related to that topic.

In the practical part of the thesis, the student chose the model, which was subsequently produced by various methods of 3D printing. A total of 10 samples were repeatedly (immediately, 14 and 84 days after manufacture) digitized with an optical 3D scanner and a dimensional and shape inspection was performed. Based on these analyses, the precision of 3D printing by individual technologies as well as errors due to aging of the material were determined.

It is evident from the practical part that the student broke into the problematic and he can apply theoretical knowledge practically. On the other hand, there the student sometimes made mistakes, probably resulting from insufficient experience. The biggest problem is the fact that the textual description of the results sometimes does not correspond to the graphical outputs. This makes an impression that the student did not pay enough attention to processing or he did not fully understand to the problem.

The diploma thesis is elaborated clearly in an overall view, it has a logical succession, and formal aspect of the work is good. However, the author made unnecessary mistakes that reduce the quality and relevance of the outputs.



| Evaluation aspects of master's thesis                                  | Assessment * |
|--|--------------|
| Fulfilling scope of assignment   | 1-           |
| Quality of the abstract, keywords ...                                  | 2            |
| Scope and quality of the search  | 3            |
| Correctness and completeness of references                             | 2            |
| Suitability, proportionality of the methodology used                   | 1-           |
| Professional level of work, results processing, discussion             | 2-           |
| Initiative to solve problem  | 2            |
| Own contribution to solved problems                                    | 2-           |
| Formulation of the conclusions of the thesis                           | 2-           |
| Importance for practice, applicability                                 | 2            |
| Typographic and language level   | 2            |
| Formal aspects and structure of thesis (text, chapters, illustrations) | 1-           |

\* 1 Excellent, 1- Excellent minus, 2 Very good, 2- Very good minus, 3 Good, 4 Failed.

Additional questions:

- 1) What type of alignment (nominal versus current model) did you use during the inspection? Does the type of alignment the effect on the evaluated dimensions and the colour map of deviations? If so, explain how and why.


Classification of work:

This work meets the requirements of the assignment and for the conferment of academic degree, therefore I recommend it for the defence.

I suggest this work to classify as

**2 ... Very good**

Liberec, 2017/01/15

  
 .....  
 Ing. Radomír Mendřický, Ph.D.  
 Master's thesis supervisor

