

REVIEW OF MASTER'S THESIS - SUPERVISOR'S COMMENTS

Author of the master thesis: Aravind Prasad Srikanthan

Name of the master thesis: Reverse engineering of machine part by parametric manner

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

The main aim of thesis was the design and realization of process for reverse engineering of machine part containing parametric surfaces. The theme is very actual, because 3D digitizing and reverse engineering are used extensively in many industries currently.

In the theoretical part, the author describes the methods used for obtaining 3D data. The methods of transformation of polygonal network to surface models suitable for CAD / CAM applications are explained. There is also done a search of the available software for reverse engineering in accordance with the assignment. The theoretical part of the thesis is appropriately chosen with respect to the topic and I have no more serious comments about it.

In the practical part of the thesis, the student chose the machine part to which he applied a full process of reverse engineering. The selected component was perhaps too simple, on the other hand the entire RE process is very demanding. Student performed 3D digitizing of the component, he designed new model in the specialized software for RE, created the NC program and he manufactured a new modified part on a CNC machining centre. He scanned this model again using the optical 3D scanning for inspection. This whole process is also described in detail in the diploma thesis. Unfortunately, there isn't generalization of this methodology, which reduces the value and wider applicability of this method. During the processing of the practical part, the student sometimes made mistakes, probably resulting from insufficient experience. For example, I consider an inappropriately positioned coordinate system for model design as the biggest fault, because it has negatively affected the production and the subsequent inspection. I appreciate positively that the student worked actively, showed great effort and was well able to apply the theoretical knowledge. I miss sample report from measurement and NC program listing in the appendix of the thesis.

The diploma thesis is elaborated clearly in an overall view. Formal aspect of the work is good. Just there are unnecessarily many images used at the expense of the text in the practical part.



Evaluation aspects of master's thesis	Assessment *
Fulfilling scope of assignment	1-
Quality of the abstract, keywords ...	1-
Scope and quality of the search	1-
Correctness and completeness of references	1-
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	1-
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) Figure 6.40 shows the dimensional control in SW GOM Inspect. To create a distance dimension, the SW offers many different procedures. Which one was used in your case?
- 2) What part of RE (digitization, designing based on scanning, NC programming, manufacturing) is the most demanding in your view?


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, 2017/06/08



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

