

REVIEW OF MASTER'S THESIS

First name and surname: **Machris Ruben John Dias**

Master's thesis topic: **Design of the printing head for 3D printing from the concrete**

The presented master's thesis is in the range of 76 pages. The thesis has 2 annexes (CD, drawings). The author divided the work into 8 main chapters.

The main aim of this master's thesis was to collect information about 3D printing applications in civil engineering and architecture. Next aim was to design a printing head for a printer/extruder.

Theoretical part

Here are described the most widely used 3D printing technology and processes for the production of small objects. The author presents 3D printing technology in the civil engineering – contour crafting, extrusion methods. Current trends are mentioned in the text. The author presents the existing projects, both commercial and universities. One chapter deals with patents. This chapter is brief and could be more elaborated. The author could focus more on patents on the design and principle of the printing head. Text of the theoretical part is supplemented by a number of illustrative figures. There are a number of references to literature. The author demonstrated the ability to analyze obtained information and to process it clearly.

Practical part

The author did not hesitate to communicate with a researcher from abroad to get advice on the printing head design. The author made a prototype printing head design in two variants. Prototypes in scale were made of ABS plastic on a 3D printer. Experiments were performed to extrude the cement mixture using prototypes. At the end there is a comparison of prototypes and a description of their advantages and disadvantages. Text is completed with photos.

The author started from nothing. He had to study many sources (a list of 73 items). The survey and results will be very useful for further activities at the university.

Question: Are there patents describing the design and principle of the printing head? Do these patents cover Europe or the Czech Republic?

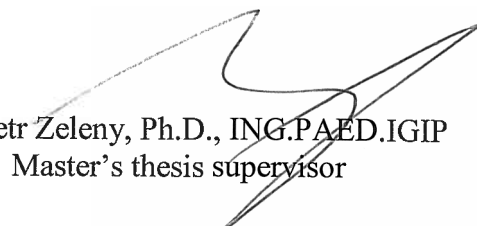
Overall, the work is comprehensible and clear. The author fulfilled the requirements of the thesis.

Master's thesis meets the requirements for granting the academic title Ing.

I recommend master's thesis for defence.

Liberec 7. 6. 2017

Ing. Petr Zeleny, Ph.D., ING.PAED.IGIP
Master's thesis supervisor



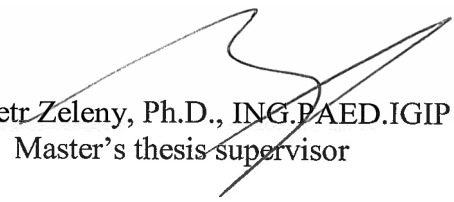
**ASSESSMENT PROPOSED BY THE SUPERVISOR OF MASTER'S
THESIS**

Master's thesis of **Machris Ruben John Dias**

on topic: **Design of the printing head for 3D printing from the concrete**

I propose to evaluate the grade **- Very good -**

Liberec 7. 6. 2017


Ing. Petr Zeleny, Ph.D., ING.PAED.IGIP
Master's thesis supervisor