Supervisor assessment of Master's Thesis

Student: Masárová Mária, Bc.

Title: Evolutionary Design of Ultrasound Treatment Plans (id 23930)

Supervisor: Jaroš Jiří, doc. Ing., Ph.D., DCSY FIT BUT

1. Assignment comments

The goal of this Master's thesis was to evaluate the suitability of different evolutionary algorithms for the problem of designing ultrasound treatment plans with a given target and prohibited areas. **The complexity** of this topic **is** slightly **above average** since it requires to learn a lot of domain specific knowledge.

This thesis was mostly experimental and required a lot of tuning of used optimization algorithms and time consuming experimental evaluations. The outcome of this thesis showed that it is generally possible to use evolutionary algorithms for this task and marked out promising research directions. However, it also pointed out the need for additional experimental and research work, mostly in the area of efficient fitness function evaluation and parallelization, which however was not the topic of this thesis.

2. Literature usage

The student worked mostly independently with related literature, and actively looked up information the evolutionary techniques and ultrasound propagation simulations. From my perspective, the student has a deep knowledge in this area and used the literature appropriately.

3. Assignment activity, consultation, communication

The student was very active, dutiful and diligent during the whole year. The meetings were organised biweekly and took about one hour. The student was always well-prepared being able to present her progress in details and draw future work directions. She was open to new ideas and willing to devote much effort in the implementation and testing. The activity seemed to be a bit higher during the winter semester when I had more opportunities to inspect the source codes and the results.

The progress of the work is captured by a GitLab repository and documented using issues. **Overall, the collaboration with Mária during the whole project was very good.**

4. Assignment finalisation

The activity while finishing the thesis was very good. I was given the main parts of the thesis a few weeks before the submission deadline while the full thesis was available about a week before the deadline. Most of my comments were addressed, however, since I was able to see the whole picture quite late, some last minute ideas on how to accelerate the evaluation could not be applied.

5. Publications, awards

6. Total assessment   **very good (B)**

Mária Masárová was a proactive and enthusiastic student who worked hard on her diploma thesis. The activity during the whole year and finalization of the thesis was very good. Considering the thesis required to learn a lot of domain specific knowledge, she did a very good job. **I evaluate her work by 88 marks (B).**

In Brno 1 June 2021

Jaroš Jiří, doc. Ing., Ph.D.
supervisor