Review of Bachelor's Thesis

Student: Varga Marek
Title: Comparison of the Effect of Fingerprint Image Compression Algorithms on the Quality of Matching Algorithms (id 21646)
Reviewer: Kanich Ondřej, Ing., Ph.D., DITS FIT BUT

1. Assignment complexity   **average assignment**

I consider assignment of this work as average difficulty. Goal of this work is to analyse effects of image processing (mainly compression algorithms) on fingerprint image. It uses known filters, compression, image processing and other algorithms, there is a lot of what should be done.

2. Completeness of assignment requirements   **assignment fulfilled with enhancements**

The assignment was fulfilled. As an extension student processed a lot more image processing algorithms that it was specified in the assignment. There were 225 different altered images from one source image. On top of that solution also contains GUI and even the evaluation is build-in.

3. Length of technical report   **in usual extent**

Scope of the work is in usual range. Nevertheless there is a huge appendix part which contains graphs and tables which are important for the evaluation. Extent of these appendixes shows the scope of work done in the thesis.

4. Presentation level of technical report   **78 p. (C)**

Thesis has a logical structure, chapters have their extent balanced and their continuity is fine. The only problem is the readability of the chapter 4 (testing) where there is a lot of text which is hard to process. It is accompanied by references to the graphs and tables in appendixes, but it lacks some easy to understand structure that would be more clearer to the reader.

5. Formal aspects of technical report   **82 p. (B)**

There are only minor issues with formal aspects of the report. Sometimes references lacks the specification (whether it is reference to the chapter, figure or something else), in few cases there is not used the right technical term, and there are some spacing problems.

6. Literature usage   **86 p. (B)**

Bibliographic sources are up to date, but there could be a little bit more of them. Citation are complete and in accordance with citation practices. Student clearly distinguished his own work from the others. It would have been better if some citation in footnotes would have been in literature and some links would have been in footnotes, but that is minor issue.

7. Implementation results   **95 p. (A)**

The implementation solution contains a lot of filters, compression methods (with settings), GUI, possibility to save/load previous settings so I evaluate it as excellent. Documentation is detailed and all frameworks are used in compliance with licence agreements. Quantity of results is enormous and they are evaluated and discussed.

8. Utilizability of results

I am not aware of work that would make all these comparisons in fingerprint images. This work it introduces a new knowledge which can be used in further research.

9. Questions for defence

- The results shows that preprocessing of images made the quality almost always worse. Is it possible that algorithms used for evaluation use its own preprocessing which interfere with one that was made in the work?
- Would it be beneficial, in your opinion, to evaluate quality of fingerprint before the compression and then choose compression (and preprocessing) based on that quality result?

10. Total assessment   **90 p. excellent (A)**

Overall the text part is above average, implementation solution is excellent and there are enormous quantity of data created and analysed. The way of presentation of the results is not the best, but in the end everything is summed up and main results are clear. Based on this and previous comments I evaluate this work as **A** (**excellent**) with **90** points.

In Brno 26 June 2020

Kanich Ondřej, Ing., Ph.D.
reviewer