THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Photo Culling – Selecting a Representative Set of Photographs**
Author's name:	**Lukáš Bartůněk**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis reviewer:	Ing. Jan Čech, Ph.D.
Reviewer's department:	Department of Cybernetics (VRG)

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment **ordinarily challenging**

How demanding was the assigned project?

The problem is interesting from several respects (e.g., natural ambiguity, multiple criteria). There are available tools for Image quality assessment and image similarity which are ready to use. Nevertheless integrating everything into a selection classifier and a working application requires non-trivial understanding and engineering skills.

Fulfilment of assignment **fulfilled with minor objections**

How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.

I consider the assignment fulfilled. Certain optional points of the assignment (e.g. training from the dataset) were done as well. I have to formally point out that points 2 and 5 were fulfilled only partially. No evaluation of any competing software was presented. I understand the reason was the unavailability of these tools or their difficulty to provide a comparable result. Therefore, this objection is minor.

Methodology **correct**

Comment on the correctness of the approach and/or the solution methods.

The methodology was correct, I like the systematic approach.

Technical level **A - excellent.**

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

I appreciate that the thesis proposes three selection mechanisms (logical function, trained logical approximation, trained neural network) and the method is evaluated quantitatively against a selection made by a human. A small user study is also done.

Formal and language level, scope of thesis **C - good.**

Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?

The text would benefit from proofreading. There are several typos/grammatical errors and typographical excesses. Equations should be integral parts of sentences, while sentences often end before the equations. All figures containing the selected photos, e.g. Fig. 8.1, show the photos that are too small and hard to see in detail and to compare for a reader. Putting off the screenshot of the app into the Appendix is not a good idea when the chapter in the thesis describes additional details.

Selection of sources, citation correctness **A - excellent.**

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

No problem.

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

The major problem I see is a missing evaluation of the components. I would expect, that, for e.g., the image quality, a ranking is shown. That is, take a large set of photos, evaluate the quality of each one, and sort them. Show N best and N worst photos according to the quality. This would give a quick comparison and intuition how good a certain quality predictor is and perhaps would suggest what a trigger for high-/low-quality predicted is.

The binary classifier is, in fact, a detector. I would suggest to show precision-recall curves and not only the results at a single operating point. Again, I would strongly recommend to show the ranking (sorted according to the final softmax of the selection classifier). The thesis shows only the selected photos, while never showing the worst photos, which have the lowest softmax response.

Selection of photos is naturally a highly subjective procedure. It would be interesting to know what consensus/diversity among human annotators is. There is a result of a single volunteer, which is clearly not enough.

Minor: ``SIFT-method" is a weird notion. From the context I understood that the Bag of Words method was meant, i.e. keypoint detection, SIFT descriptor, k-means quantization, histogram as an image descriptor, and cosine similarity.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

The grade that I award for the thesis is **A - excellent.**

Questions:

1) It seems that the method has difficulties in identifying near duplicate photos. Can you explain why this happens?
2) For family holiday snaps, it seems that people in the photos are the most important. Faces and facial expressions seem relevant. The thesis did not consider this idea at all. How would you implement it?

Date: **29.1.2024** Signature: