Supervisor's statement of a final thesis

Student: Martin Lupták
Supervisor: Ing. Jakub Žitný
Thesis title: Legitimizing monitored subjects using image recognition techniques
Branch of the study: Knowledge Engineering

Date: 10. 6. 2020

<table>
<thead>
<tr>
<th>Evaluation criterion:</th>
<th>The evaluation scale: 1 to 4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fulfilment of the assignment</td>
<td>1 = assignment fulfilled, 2 = assignment fulfilled with minor objections, 3 = assignment fulfilled with major objections, 4 = assignment not fulfilled</td>
</tr>
</tbody>
</table>

**Criteria description:**
Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently. In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment’s fulfilment and the way it affected your final evaluation.

**Comments:**
All parts of the assignment are fulfilled.

<table>
<thead>
<tr>
<th>Evaluation criterion:</th>
<th>The evaluation scale: 0 to 100 points (grade A to F).</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Main written part</td>
<td>82 (B)</td>
</tr>
</tbody>
</table>

**Criteria description:**
Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies? Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 26/2017, Art. 3. Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

**Comments:**
The thesis is well-structured, and necessary details are described in both theory and practical part. The student obviously knows what he is doing. Many partial-solutions are very creative and show impressive results. Possible drawbacks or improvement ideas are mentioned as requested in the assignment. On the other hand, it is sometimes difficult to flow through the chapters. The “end game” or a precise problem formulation is not present, only a “story” about how the student has built his solution. Some intermediary results would be more understandable in tables or figures instead of directly in the text. The story is interesting, though, but more comparisons with other architectures or existing solutions from literature would be valuable. Citations and references are quite weak.

<table>
<thead>
<tr>
<th>Evaluation criterion:</th>
<th>The evaluation scale: 0 to 100 points (grade A to F).</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Non-written part, attachments</td>
<td>80 (B)</td>
</tr>
</tbody>
</table>

**Criteria description:**
Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.

**Comments:**
The repository contains code for the experiments from the practical part. However, the repository is not really usable for further experimentation by someone other than the student himself. Bonus points for the Docker environment for setting up Jupyter, also for using Tensorboard and CloudWatch.

<table>
<thead>
<tr>
<th>Evaluation criterion:</th>
<th>The evaluation scale: 0 to 100 points (grade A to F).</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Evaluation of results, publication outputs and awards</td>
<td>93 (A)</td>
</tr>
</tbody>
</table>

**Criteria description:**
Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.
The results are very impressive and usable in real-world scenarios after final polishes. Some of the “creative” parts, such as using Inception-v3 for color detection, are too heavy for the task. So a less complex solution without ML could be helpful in multiple parts of the proposed "architecture." Building an end-to-end network for all parts of this task would be perfect.

### Evaluation criterion:

<table>
<thead>
<tr>
<th>5. Activity and self-reliance of the student</th>
<th>The evaluation scale: 1 to 5.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5a:</td>
<td>1 = excellent activity,</td>
</tr>
<tr>
<td></td>
<td>2 = very good activity,</td>
</tr>
<tr>
<td></td>
<td>3 = average activity,</td>
</tr>
<tr>
<td></td>
<td>4 = weaker, but still sufficient activity,</td>
</tr>
<tr>
<td></td>
<td>5 = insufficient activity</td>
</tr>
<tr>
<td>5b:</td>
<td>1 = excellent self-reliance,</td>
</tr>
<tr>
<td></td>
<td>2 = very good self-reliance,</td>
</tr>
<tr>
<td></td>
<td>3 = average self-reliance,</td>
</tr>
<tr>
<td></td>
<td>4 = weaker, but still sufficient self-reliance,</td>
</tr>
<tr>
<td></td>
<td>5 = insufficient self-reliance.</td>
</tr>
</tbody>
</table>

**Criteria description:**

From your experience with the course of the work on the thesis and its outcome, review the student's activity while working on the thesis, his/her punctuality when meeting the deadlines and whether he/she consulted you as he/she went along and also, whether he/she was well prepared for these consultations (5a). Assess the student’s ability to develop independent creative work (5b).

**Comments:**

The student was totally independent and pretty active in searching for creative solutions.

### Evaluation criterion:

<table>
<thead>
<tr>
<th>6. The overall evaluation</th>
<th>The evaluation scale: 0 to 100 points (grade A to F).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>85 (B)</td>
</tr>
</tbody>
</table>

**Criteria description:**

Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.

**Comments:**

The assignment was fulfilled with creativity and emphasis on high accuracy in results. The quality of the thesis text itself is good, but many improvements could be made for clarity and simplicity.

Signature of the supervisor: