THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Data Augmentation by Image-to-Image Translation for Image Retrieval**
Author's name:	**Albert Möhwald**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis reviewer:	Dmytro Mishkin
Reviewer's department:	Department of Cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment   challenging

How demanding was the assigned project?

The assigned task is to study different image-to-image translation methods, specifically generative adversarial networks (GANs) performance for the day-night image retrieval task. It is technically challenging task, from many points of view, specifically because that GANs are widely known to be hard to train.

Fulfilment of assignment   fulfilled

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.

All the main goals have been achieved.

Methodology   correct

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

Selected methodology is correct.

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?

Student employs enough technical expertise is the field of study. The image translation is quite hard and challenging are for the research and engineering and the student performed well. Specifically, he significantly improved the results of well-tuned baseline on a challenging day-night retrieval dataset from 0.79 to 0.86 mAP points.

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?

While the thesis is reasonably easy to read, there are several issues with it. First, it would benefit from the proofreading. To name a few examples: Figure 1.1 caption contains a probably ToDo note in Czech: "pridat denni yet", FID abbreviation is used in several places, starting with Figure 1.2, but is defined only in Section 4.1.4. Figure 5.1 contains no legend and it is impossible to tell, while color is which network.
Conclusions contain phrase "the inception embedding network can be replaced with a network commonly used for image retrieval e.g. fine-tunned VGG16.", while the Chapter 5 states that "VGG16" is used for the experiments and the Inception was never mentioned. It looks like that the conclusions are put from some preliminary version by mistake rather than from the final version.
The image retrieval task is not precisely defined. It seems that an author considers instance retrieval task (as opposed to "similarity search"), but it is not clearly stated.

Selection of sources, citation correctness	B - very good.

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?

The references are adequate and meet the standards.

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.

Overall, I am impressed with the technical part and not impressed with the writing.

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.

Overall I like the work done and is willing to give a very high grade. However, the presentation and overall writing quality are also important parts, especially such thing as conclusion. I would recommend to work on the writing and submit the adapted and polished version of the thesis to the Computer Vision Winter Workshop.

I would like to ask the following questions.
1. Was image-to-image translation used for the retrieval evaluation phase, i.e. query image translated by network first and then embedded, or the original images were used?

2. Why, in your opinion, the supervised pix2pix model performs worse than unsupervised CycleGAN even for Transattr dataset, which has complete ground truth? Ref: Table 5.1, two last rows.

3. Why did you choose not to train augmentation network with help of embedding network feedback, i.e. optimizing for the downstream task?

The grade that I award for the thesis is B - very good.

Date: 06/08/20

Signature: