

I. IDENTIFICATION DATA

Thesis name:	Conditional Adversarial Networks for Colorization and Stylization of Hand-drawn Sketches
Author's name:	Barbora Dědková
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Cybernetics
Thesis supervisor:	Giorgos Tolias
Supervisor's department:	Cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The assigned task is a challenging open problem. The lack of direct ways for quantitative evaluation makes the progress even harder. The required background is demanding and wide including deep neural networks, generative adversarial networks and their training. The challenge is somehow decreased by the fact that publicly available implementations exist. It was recommended to the student to use, understand, and extend them.	

Satisfaction of assignment	fulfilled with minor objections
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
The final outcome and overall progress during the work on the thesis is more than satisfactory. The progress was somehow slow at the first part of the thesis and with a reasonable rhythm later on; the early slower progress had a minor impact at the overall progress.	

Activity and independence when creating final thesis	B - very good.
<i>Assess that student had positive approach, time limits were met, conception was regularly consulted and was well prepared for consultations. Assess student's ability to work independently.</i>	
The supervisor and the student had regular interaction through meetings and emails. The student was most of the times prepared to provide intermediate results for discussion and make questions that helped the progress. The student was able to both follow some of the supervisor's suggestions and also independently proceed with personal choices.	

Technical level	B - very good.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
The student investigated a rather challenging problem and employed very recent state-of-the-art approaches for image-to-image translation. The background of such an approach includes basic knowledge of deep convolutional neural networks, generative adversarial networks, conditional adversarial networks and their training. The student gained theoretical knowledge in all these and practical knowledge for generative adversarial networks through using and modifying a publicly available implementation and conducting a large number of experiments.	

Formal and language level, scope of thesis	C - good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
The overall organization, flow, and state of the manuscript is good. The use of the English language could be improved and the clarity of the presentation could be also improved in some cases. The usage of mathematical notation and technical terminology is not always careful.	

Selection of sources, citation correctness

B - very good.

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The student has made good work in studying, understanding and presenting prior work that is related to the methodology used in a broader sense. The related work on the particular task of study (narrower sense) could have been somehow deeper; this is a minor negative aspect.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

The student started the work on the topic without any prior background or knowledge on the employed methodology. By the end of the work, she developed theoretical understanding in the overall field of deep learning and in particular for generative adversarial networks. The technical knowledge obtained is also considerable. It was obtained by testing the impact of a number of different design choices, parameters and loss functions. The examined task suffers from subjectivity in the evaluation, since there are no straightforward quantitative ways to evaluate; qualitative comparisons are the most common way. The thesis slightly lacks of a more organized presentation of the critical examples that help in concluding about the essential design choices and parameters.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

The student has made a significant progress during the work of the thesis and obtained a significant amount of knowledge on the examined field and methodologies. The produced manuscript is valuable for a future reader, but still has space for improvements in terms of clarity of the presentation and more careful technical presentation. The student managed to investigate most of the predefined goals up to a good or satisfactory extend and showed the ability to work independently. The experimental results give insight to the predefined questions, but could have been presented in a more organized and systematic way. All in all, the result, collaboration and motivation to work on the topic of the thesis were "very good".

Questions for the defense:

- What are the advantages and disadvantages of using CGANs for this task ?
- What is the role and effect of the total variation loss? Is this a good choice for the examined domain? Why?
- Applying the discriminator on patches (70x70) is worse than applying it on the whole image (fig.5.2). This result is different than the one in [Isola et al., 2017]. How is this justified?
- How is it possible that cGAN (fig.5.3 left) without any content loss (L1,L2) achieves so good results? What is your interpretation?

I evaluate handed thesis with classification grade **B - very good.**

Date: **30.5.2019**

Signature: