Supervisor's statement of a final thesis

Supervisor: Ing. Jan Čech, Ph.D.
Student: Petr Jahoda
Thesis title: Pose and Expression transfer between face images
Branch / specialization: Knowledge Engineering
Created on: 6 June 2023

Evaluation criteria

1. Fulfillment of the assignment

▸ [1] **assignment fulfilled**
  [2] assignment fulfilled with minor objections
  [3] assignment fulfilled with major objections
  [4] assignment not fulfilled

The assignment was completed in full.

2. Main written part   100 / 100 (A)

The thesis presents a related literature survey and technical background, prior to the proposed method and its experimental evaluation. The level of detail is sufficient.

3. Non-written part, attachments   100 / 100 (A)

The attachment contains video results and test scripts including a link to trained models. The video results demonstrate the fidelity of the expression transfer on several identities, including a challenging painting example. The test scripts are available so that a user could generate additional results.

4. Evaluation of results, publication outputs and awards   100 / 100 (A)

The method is thoroughly evaluated. Both expression transfer fidelity and face identity conformity are quantitatively evaluated against several baselines. Qualitative results are presented by many examples.

The method is original in the sense that it relies on the pre-trained high-quality photorealistic StyleGAN2 model and is trained from videos in a self-supervised way. The results achieved are impressive. On the other hand, the results do not achieve the quality of the most recent state-of-the-art models. The architecture, together with self-supervised training and a fixed StyleGAN2 decoder, provides an interesting insight, how

flexible the popular StyleGAN2 is. Therefore, we will consider publishing the work on a specialized conference or workshop.

5. Activity of the student

▸ [1] **excellent activity**
  [2] very good activity
  [3] average activity
  [4] weaker, but still sufficient activity
  [5] insufficient activity

Petr was very active and enthusiastic about the problem. Petr worked on his thesis regularly and systematically. Petr was reading related papers and was able to implement ideas very quickly. The work required several trial and error cycles, and Petr was not discouraged by initial failures and continued to try to solve the difficulties. Petr was able to identify the source of problems and often proposed several solutions to tackle them.

6. Self-reliance of the student

▸ [1] **excellent self-reliance**
  [2] very good self-reliance
  [3] average self-reliance
  [4] weaker, but still sufficient self-reliance
  [5] insufficient self-reliance

In general, I see Petr's great potential for the research: a very systematic workflow, analytical thinking, and strong programming skills.

The overall evaluation   100 /100 (A)

The problem is not trivial. It is not an implementation-only task, but an open research problem. At first, it was unclear how to handle it. Petr did a great job collecting the dataset, experimenting with several model architectures and loss functions for training, and thoroughly evaluating the trained model. The results are, I believe, impressive and promising.

In summary, I do recommend the thesis for the defense, and I suggest assessing the thesis by A -- Excellent.

Instructions

Fulfillment of the assignment

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.

Main written part

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. 52/2021, 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.

Non-written part, attachments

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.

Evaluation of results, publication outputs and awards

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.

Activity of the student

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.

Self-reliance of the student

From your experience with the course of the work on the thesis and its outcome, assess the student's ability to develop independent creative work.

The overall evaluation

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.