



Supervisor's statement of a final thesis

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Thesis title: Self-supervised model for efficient sound recognition trained on aggregated data
Branch / specialization: Knowledge Engineering
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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

At the current state of machine learning research building a model that is able to learn from weakly labeled data is an important task. In the current thesis, the student has chosen a non-trivial solution for the assignment and applied adversarially constrained autoencoder interpolation for training on aggregated audio data. The student has shown creative thinking and tremendous effort in order to complete the assignment. Unfortunately, this approach did not outperform a simple randomly initialized autoencoder. However, in the research process exploration of uncharted territories can often lead to failure, thus I consider this work as a useful research outcome with minor objections.

2. Main written part

70/100 (C)

All the parts of the thesis are contentful and necessary. Introduction and description parts are logically structured, thus are easily comprehensible, thematic flow between the chapter helps to understand audio recognition techniques by a general reader with no prior knowledge. However, in the realization part detailed description of the obtained results is needed. literature sources are properly cited, nevertheless, the reference list is not formatted uniformly. Overall, the citation ethics has not been violated and the software and other copyrighted works have been used in accordance with their license terms.

3. Non-written part, attachments

90 /100 (A)

The student has provided the source code. The main advantage of the non-written part is the weekly labeled audio dataset, which can be very useful for future research.

4. Evaluation of results, publication outputs and awards

70 /100 (C)

Training on weakly labeled data using adversarially constrained autoencoder interpolation did not show better performance than randomly initialized autoencoder. Nevertheless, this is the first experiment of such type, therefore, there is plenty of room for investigation, which is stated by the student in the 'Conclusion and Outlook' section.

5. Activity of the student

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

The student was active during the thesis preparation, well-prepared for the consultations, had his own ideas and showed lots of enthusiasm and initiative.

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

The student has shown excellent self-reliance, creativity, and ability to work independently.

The overall evaluation

75 /100 (C)

Overall, the final thesis is valuable research work. It deals with an important topic and the student has shown creativity and self-reliance by applying a non-trivial approach. Moreover, the weakly labelled audio dataset can be useful for future research.

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. 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.

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.