

Review of Bachelor's Thesis

Student: Pankuch Adam
Title: Algorithmic Music Composition (id 22952)
Reviewer: Beran Vítězslav, Ing., Ph.D., DCGM FIT BUT

1. **Assignment complexity** **more demanding assignment**
The successful solution of the assignment requires, in addition to getting acquainted with specific formats of music notation, also the use of advanced technologies in the field of machine learning.
2. **Completeness of assignment requirements** **assignment fulfilled**
The solution of the work is focused on the generation of guitar parts.
3. **Length of technical report** **in usual extent**
The text of the report is rich in information, does not contain unnecessary parts and contains everything essential.
4. **Presentation level of technical report** **70 p. (C)**
The report contains chapters that have six subchapters or no subchapter. The question is how important the individual chapters are in principle, when they have a length of, for example, 1.5 pages.
The comprehensibility of the text and a better appreciation of the author's ideas would help if the report contains a more detailed description of the specific task that the author wants to solve and what the author wants to achieve as a result.
5. **Formal aspects of technical report** **85 p. (B)**
The work is written in English, and what the reviewer (native Czech) can judge, it contains minimal grammatical errors and the level of expression is above average. The text sometimes contains the literature reference out of the sentence, or "eg." instead of "e.g.". The report is written in LaTeX and has a very good typographic quality.
6. **Literature usage** **90 p. (A)**
Selected study resources are relevant and cover all key aspects of the work - from algorithmic music composition in general, through partial music formats, to the various neural network concepts. The acquired knowledge is properly separated from author's ideas.
7. **Implementation results** **85 p. (B)**
The implementation output is two-fold: a new dataset of guitar parts and several (5) designed and trained models of neural networks of various types and parameters, including experimental evaluation and discussion of the quality of automatically generated parts. Both implementation results are of good quality thanks to a professional approach and care. As the task of automatic music generation is very complex and sensitive to data preprocessing, network architecture and selection of training data, the low quality of the generated music is understandable.
8. **Utilizability of results**
The newly created dataset of guitar parts and implemented CNN models can be used for further experiments in this area.
9. **Questions for defence**
 - Selecting a length of 6 seconds for training samples does not reflect the structure of the measures and motif. Isn't this a problem of results achieved?
 - The convolution core of the first CNN layer of size (5,1) (large third in music theory) cannot capture harmony properly. Isn't this a problem of results achieved?
 - What is the main reason for CNN Stride's best result?
10. **Total assessment** **90 p. excellent (A)**
Mr. Pankuch has solved an advanced task in machine learning. He did not have a suitable dataset or a similar existing CNN structure that he could use for inspiration or continuous development. He had to master this advanced issue well and create everything himself. Although the resulting solution does not generate "music", he solved all technical problems and created a usable dataset of guitar parts and several variants CNN models, that he trained and properly evaluated.

In Brno 17 June 2020

Beran Vítězslav, Ing., Ph.D.
reviewer