

## Abstract

The aim of this thesis is to explore new ways of generating unique polyphonic music using neural networks. Music generation, either in raw audio waveforms or discretely represented, is very interesting and under a heavy exploration in recent years. This thesis works with midi represented polyphonic classical music for piano as training data. We introduce the problem, show relevant neural network architectures and describe our numerous ideas, out of which one idea, our experiment with three versions of skip residual LSTM connections for music composition, we consider a good contribution to the field. In related work, skip-connections were explored mostly for classification tasks, however, our results show a solid improvement for music composition (e.g. 47% of respondents considered our samples real). We also show that skip-connections have rather diverse hyperparameter space for future tuning. Apart from standard automated test set evaluation, which is hard to design and interpret for creativity mimicking models, we also did a complex evaluation through surveys. The evaluation was specifically designed to not only to show results for our samples, but to reveal information about expectancy, preconceptions and influence of personal characteristics of the respondents. We consider this a valuable resource for future works in automated music generation.