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The Beethoven – Generating Music from Lyrics Using Encoder-Decoder Architecture

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Abstract

Even though every single person in the world listens to music at any moment as an essential part of human life, there are only relatively few people who involve in music creation. Because music is a subjective matter that can be influenced by personal opinions, tastes and feelings. Music creators are called as musicians and they have specialised knowledge and good practice in music creation. Although non-musicians are unable to create music, they like to create music for their thoughts while listening to music. This problem is addressed in this research, and **The Beethoven** is the proposed solution that is able to generate music for given lyrics aimed for non-musicians who like to write lyrics and create music.

The correlation between sound characteristics of music and words of lyrics is identified, and the gaps of software-based music composers are analysed with the literature analysis. In order to fulfil the gap, the software is implemented consisting of a deep neural network called seq2seq encoder-decoder model alongside with a custom created lyric-notes mapping dataset. The seq2seq architecture consists of two phases,

1. learning phase that fits the model
2. inference phase that makes note predictions and generates MIDI file and music sheet.

Since music is a subjective domain, human evaluation is more suitable than technical evaluation. In order to evaluate the solution, a blind test is distributed among non-musicians that has to select whether a given piece of music is auto-generated or human composed. Results of the evaluation method indicate that The Beethoven behave well in automated music generation fulfilling the research gap.

Keywords: Automated music generation, lyrics, MIDI, seq2seq, lstm, music21

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