AI Lyrics for Music

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Abstract

AI Lyrics can be used for the traditional classical Chinese folk song. This research introduces our method to generate AL Lyrics for a song, with LSTM deep learning model, and structure analysis. The lyrics composition systems take one of the famous poems by the famous poet Su Tung-Po in Sung dynasty of Chinese history for example. Finally we also expect that our AI Lyrics method can be applied to integrate the automated music composition with proper algorithms in the future.

Keywords: AI Lyrics, Classical Chinese Folk Song, LSTM Deep Learning Model, Automated Music Composition.

1. Introduction

The first report of the "Artificial Intelligence and Life in 2030" by Stanford University's "Artificial Intelligence and Life in 2030" pointed out that the various uses and effects of artificial intelligence do not occur independently of each other, nor are they independent of many other societies. And the development of technology, the application of artificial intelligence is about to penetrate into the field of human life. The study of artificial intelligence has gradually turned to the establishment of a human-conscious and trustworthy intelligent system. The performance of information processing algorithms is accompanied by significant advances in hardware technology, such as perception, perception and target recognition, in addition to the perception processing of video tags and behavior recognition. Machine deep learning has also evolved towards audio, speech and natural language processing [1]. At present, the concept of music therapy is generally accepted, and research related to music and health is receiving more and more attention. For example, the Media Lab of the Massachusetts Institute of Technology has conducted a technology research and development of Music, Mind & Health, which successfully enabled cerebral palsy patients to move through muscles. And brain awareness, the performance of real-time music creation [2]. When we can build a set of computational data sufficient to test the performance of music on the human body, AI can find out the relevance of the physical characteristics of music participants from these complex musical features, and optimize the prediction of the true response of human music behavior. In this way, the application of music therapy will be made breakthrough and quickly become an industry. Such success will affect the development of AI-related industries, such as smart care agents: the University of the Southern California Department of Information Robotics Lab, a socially assistive robotics that applies this technology to address growing health care issues. These socially assisted robots can train, motivate, or accompany special health care needs, including gait rehabilitation in the post-stroke [3] and cognitive improvement [4]. The University of the Southern California Department of Information Robotics Lab is working with Google to develop a music therapist robot to provide an interactive music game for elderly people with Alzheimer's disease and music robots to improve the cognitive function and enhance the elderly. Positive behaviors such as smiling, speaking and participating in group activities are included [5]. Beyond aggregate performance statistics, on-field signals can be monitored using sophisticated sensors and cameras. Software such as MuseScore [6] has been created for composing music, Shazam recognizing soundtracks [7]. Annie Dorsen is a foundation for contemporary arts using techniques from computer vision used in creating stage performances [8]. In this presentation, we address AI and deep learning technologies adopted to promote healthcare.

2. Research Method

To compose lyrics for a piece of music, it is not an easy task. First of all, we must understand the structure of the music before we could write lyrics. How many phrases and many words in a phrase are needed in a song? Since we focus on composing popular songs and folk songs in Taiwan. In most popular songs, they tend to have very regular structure patterns that consist of introduction, verse, pre chorus, chorus, bridge, inter, instrument solo, and outro. For lyrics writing, we have to consider the verse, pre chorus, bridge and chorus parts. Normally, we express background statements in the verse part while the feelings and emotions in the chorus part. The pre chorus and bridge are the transition. We need to control the word set in writing so that computers can automatically switch in the lyrics writing according to the different themes. We have designed both syntactic and semantic templates to fill words in lyrics for a song. Secondly, we have to understand the purpose and emotion of the song to be

composed. Is it a sad or happy song? Is it to confess love or to express the suffering of loneliness due to departure? In this regard we have classified words into positive and negative set in such a way that the lyrics writing can select words according to the emotion categories. We adopt a LSTM deep learning model and train it on a large corpus of old poems that can generate candidate words based on a sequence of background words. The overview of the lyrics composition systems is following, as shown in Fig. 1:

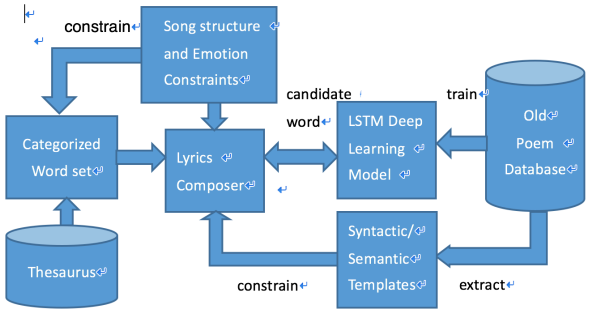

Fig. 1: The Lyrics Composition Systems Overview

3. Result of Research

Take one of the famous poems by the famous poet Su Tung-Po in Sung dynasty of Chinese history for example:

"明月幾時有，把酒問青天。不知天上宮闕，今夕是何年。我欲乘風歸去，唯恐瓊樓玉宇，高處不勝寒。起舞弄清影，何似在人間。轉朱閣，低綺戶，照無眠。不應有恨，何事長向別時圓。人有悲歡離合，月有陰晴圓缺，此事古難全。但願人長久，千里共嬋娟。"

In this Chinese poem, the character number structure is "5-5-6-5;6-6-5-5-5;3-3-3;4-7;6-6-5;5-5" while among the 19 phrases, the last word in the 2nd, 4th,7th, 9th, 12th, 14th,17th and 19th phrases must follow the rhythmic rule of the same rhyme. The syntactic structure for the first phrase id [noun, adverb, verb]. The theme of this poem is regarding the missing Su's brother who was in departure from a long distance. We could extract the syntactic pattern template of this poem and compose a new set of lyrics simply following the rhythmic rule. We also cluster the word set categories for different themes and recommend the words to be used by the lyrics composer. A LSTM can be trained from a large corpus of Chinese poems to predict the most likely candidate words. Therefore, the lyrics composer will pool all the content information as well as reconcile with the constraints posed from various sources and come up with a lyrics.

6. Conclusion and Future Work

This research analyzes the AI Lyrics generation method for music composition. Machine deep learning and some other methods can be applied for Chinese Lyrics generation. In the future, we would continue to work on the integration between AI Lyrics and Algorithmic Music Composition to generate a song with proper situations.

With the limited data of Bei Guan music, it reveals the same or small range of results. In the future, other rhythm complexity methods will be used to analyze other types of music, so it can show more specific result for us to study, to build up rhythm complexity of any kind music, and to provide not only styles but a flexible range to control its complexity. Finally this research creates an automated with random rhythm result within a manageable range control; we hope that it provides the contribution to algorithm composition for traditional Taiwanese music.

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