Name(s)	Project Number
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Project Title

Computer-based Automatic Music Creation through Analysis of Existing Music Pieces

Abstract

Objectives/Goals

The goal of this project is to create a program that can create new music through analysis of existing music using a computer. The objective of this project is to demonstrate the role of different parameters such as Note Sequence (NS), Note Sequence Repetition Density (NSRD), and the number of Measures (M)in the existing music. Music creation using computer algorithm has two approaches: (1) dedicated executable software that are designed to produce music, (2) the composition algorithm can be developed that creates new music. In this study, the composition algorithm is used to create new music. I made hypothesis that (I) as number of Note Sequence (NS) in input music increases, so does the number of NS in output; (II) As Note Sequence Repetition Density (NSRD) in input music increases, so does the NSRD in output.

Methods/Materials

The procedure is as follows. (i) Collect three music pieces and prepare respective description tables, (ii) Set up computer, software, and develop algorithm, (iii) Create three output music pieces for each piece of input music, (iv) Repeat for Music 2 and 3, and (v) Analyze data, make a graph, discuss, and conclude. The materials used in this project are as follows: Sheet Music of Music Pieces; Laptop with Windows XP; Spiral-bound Notebook; MATLAB Software; MC MusicEditor; and MIDI player.

Results

The data shows that the output Note Sequences (NS), as well as the Note
The data showed that the output NS and NSRD depended linearly on the input NS and NSRD, as long as the input is not changed. When the input was changed, the data showed no trends.

Conclusions/Discussion

It is observed that the sheet music has trends in Note Sequences (NS), Note Sequence Repetition Density (NSRD) and number of Measures (M) that characterize the music. The trends were explored with three music pieces. Any modification of the input will produce randomness in the created music and show no trend. All these factors (NS, NSRD, M) play an important role in creating new music via composition algorithm. This project can be extended to include variations of frequency and the shape of the note sequences in creating new music. This research study is the first of its kind to create thematic music pieces effectively in a computer-based environment. The outcome of this project has a wide range of usage: waiting-music during automated phone-calls, background music in airports, airplanes, and restaurants, and so on.

Summary Statement

This project developed a composition algorithm that creates new music pieces from the existing music utilizing appropriate procedures and methods.

Help Received

Brother helped learning programming; Mother helped holding the board while pasting the sheets on the board