Project Proposal

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Problem Description

Computational Creativity (CC) is an area that concerns artificial intelligence, cognitive psychology and the arts. According to the definition of CC, the aim of this discipline is to build systems, whose behaviours can be classified as creative to unbiased observers [5].

There are several methods used for music generation [6], probablistic, rule-based, and evolutionary. We are more interested in the later, in order to build a tool that can help the user into artistic creation, specifically in music generation.

Since art is such a subjective matter one of the most common fitness functions are the interactive ones [7]. This becomes a bottleneck in the process of the music generation. Artificial neural networks are commonly used as a replace of the user input for the fitness function [7]. We want to compare human interactive fitness function with similarity based fitness function (based on user input sample). This is a faster way of generating the music according to the user tates.

In this project, we propose to create a tool that generates music with a genetic algorithm approach.

Project Scope

Development of a software tool that enables the generation of small size music according to the user's taste, through the implementation of a Genetic Algorithm.

This software tool will have a user interface (GUI or CLI) that the user can interact to give *feedback* of the melodies obtained (fitness function).

The Genetic Algorithm (GA) goal is to create brief compositions (4/4 or 8/8 measures).

The generation of music pipeline with a Genetic Algorithm is described in the flowchart of Fig.1.

Tools

1. Python - Programming Language
2. MIDIUtil - Python library that allows one to write multi-track Musical Instrument Digital Interface (MIDI) files
3. Sounddevice - Python module provides bindings for the PortAudio library and a few convenience functions to play and record NumPy arrays containing audio signals.

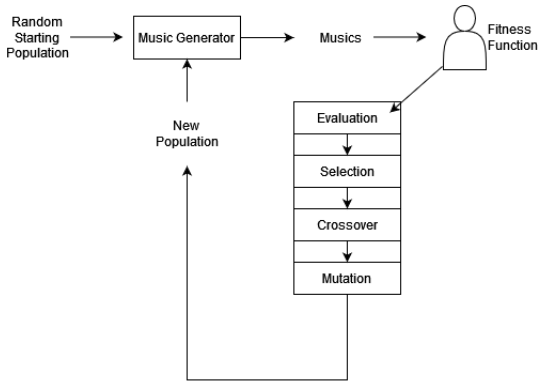

Figure 1: Genetic Algorithm Process for the generation of the music

References

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