Artificial Digitality

Abstract

This paper discusses the technical process and artistic intent of a musical album co-authored by a human and artificial intelligence. The project is aimed to finish with an album of several compositions. The album begins with a composition that is generated by the author alone, a self learnt musician and a technologist. The compositions that follow are co authored by an open source neural network and the author. The neural network is trained by the author, who has turned his compositions into mathematical data which can be fed to the neural network. The album ends with a composition that is completely generated by the trained neural network. The goal of the project is to express the rise of Artificial Intelligence in a musical way and speculate on the future of A.I. The author uses music, mathematics, and the emerging machine learning field to create a musical story. It aims to question about the future where automation is taking over the human labor in various fields including creative areas like music production and art making.

Context

The project is driven by two forces: the author's love for music composition and artificial intelligence. The author is a self-taught musician who has indulged himself in the process of music composition for a long time. Despite his constant effort to make his first music album, he has not been able to do so because of limited time and lack of creative partnerships and feedback. Five years have passed by where he has constantly evolved but the concrete outcome still lacks.

The author in these five years of music learning has been involved in various other studies related to emerging technologies and several art projects. In this time, he heard about Artificial Intelligence and fell in love with the idea that a machine can replicate him and help him to produce music that he is unable to give time to. He considers machine learning as a tool to replicate his brain and generate other body—in the computer—that he can share his soul with.

This thinking has led him to work on researching about Artificial Intelligence and machine learning that he supposes will be taking over the world very soon. The author's constant effort to achieve a system that can replicate his style of music production has finally led him to a neural network and a mathematical system that clones his musical passion.

The author aims to generate an album where machine learning is used to make music and the compositions are used as a medium to express the rise of Artificial Intelligence. Along with this he aims to speculate on the future of Artificial Intelligence and figure out the possible ways A.I. will assist humans in the future.

Process

The process involved an analytical approach to the art of music making. The author analyzed the process of making music, then gathered and converted the process into data; number and sequences, which can be used to generate a system that will clone his music making.

To eliminate the amount of errors, the author first limited the notes on the piano and the scale that he and neural network can work with. G minor scale, with two octaves was selected (G3 – G5, 15 keys). The author than composed a 20 second brief piece, that involved chords and melody. Chords (limiting to 3 notes played at once) had one variable which was the sequence of notes on the piano while melody had two variables; time and note sequence. The two piano scales and their respective keys were numbered from 1-15 and these numbers were used to get the sequence from the author's first composition. Three kinds of sequences were extracted; the chord notes, the time in melody and the notes in the melody. The value of these sequence was normalized between 0-1. This sequences where then used as an input and target data to feed to the SRN network generated in the open source software. Three neural networks were trained to give three difference sequences; for chord notes, melody noted and melody time.

The trained system was finally used to make pieces, where the first one was composed by the author, the second one by the machine and the author, and the album concludes with a music piece completely generated by the trained neural network.

References

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