

Artificial Digitality

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Abstract

This paper is about the technical process and artistic intent of a musical album co-led by a human and A.I. The project aims to make several compositions. The album begins with a composition that is generated by me alone. The compositions that follow are co authored by an open source neural network and me. The NN is trained by me, using the mathematical pattern from my compositions. The album ends with a composition that is completely generated by the neural network. The goal of the project is to express the rise of AI in a musical way and speculate on the future of A.I. I use music, mathematics, and machine learning to create a musical story. It aims to question the future where automation takes over human labor in various fields including creative areas. [1]

Context

The project is driven by two forces: the love for music composition and A.I. Despite constant efforts to make the first music album, I have not been able to do so because of limited time, and the lack of collaboration and feedback. Five years have passed by where I have constantly evolved but a concrete output is absent.

In these five years of music learning I have been involved in emerging technologies and art. I then heard about A.I. and fell in love with an idea that a machine can replicate and help me to produce music that I am unable to give time to. I consider machine learning as a tool to replicate my ideas and generate the other that I can share my soul with.

I aim to generate an album with machine learning to make music and compositions that are used as a medium to express the rise of A.I.

Along with this I aim to speculate upon the future of A.I. and potential A.I. assistance. [2]

Process

The process involved an analytical approach to the art of music making. I analyzed the process of making music, then converted the process into data; which can be used to generate a system that will mimic my music making.

I started by dividing the music album into three compositions. The content of each composition draws inspiration from the story of the development of A.I. to date. The story involves the “World before A.I.,” “Current World” and “Future (Singularity).” For “Current World” and “Future (Singularity),” C# Melodic Minor (111 bpm) and G# Hungarian Gypsy (128 bpm) scales were used to emote intelligence, while the “World before A.I.” used C Natural Minor to narrate Sentimental and Tragic. Each of the compositions were generated from the total of 15 keys offered in two octaves of their scale.

First Composition

Composer: Only human composer

Scale and bpm: C Natural Minor (90 bpm).

Chord, Melody: The very first composition was created by me with no help from the A.I. The data extracted from this composition was then used to train the three NN and get the A.I. assisting me in the other compositions. The three NN were assisting me with the chord sequence, the note sequence for melody and the time between each note in the melody. [3]

Second Composition:

Composer: Human and A.I.

Changes: Scale and bpm: Altered Scale: C-sharp/D-flat melodic minor. (111 bpm).

Chord: Chords played alternatively by me and the A.I. The first neural network assisting me with the chord sequence.

Melody: Note Progression: First and second note played by human, the second and third notes played by the neural network, and so on.
Time between the note's progression: The third neural network is used to get the time intervals between the notes. So the time interval between the 1-2, 2-3 note is decided by the human; then this data is fed to the neural network to get the time interval between the 3-4 and 4-5. And so on.

Third Composition:

Composer: Only A.I.

Changes: Scale and bpm: Hungarian Gypsy Scale: TSTSTTS: G #. (128 bpm).

Chord: Feeding value of first chord played by neural network in the neural network to suggest the next chord. And so on.

Melody: Note Progression: Feeding the first two notes played by neural network in the neural network to suggest the next two notes & so on.
Time between the note's progression: Simultaneously with the notes progression, the third neural network is used to get the time intervals between the notes. So the time interval between the 1-2, 2-3 note is decided by the neural network and fed to the neural network to get value of the time interval between 3-4, 4-5. And so on.

All Compositions

soundcloud.com/psychoactive13/sets/ad-1

Full Documentation

kuldeepgohel.com/artificial-digitality

Biography

Kuldeep Gohel is a self-taught musician, creative technologist and a 2018 graduate of Design and Technology (MFA) from Parsons School of Design, NYC. This project was part of his Master's thesis involving Machine Learning and Music, done under the guidance of Sven Travis and Louisa Campbell.

Before Parsons, he did his bachelors from NID, India in Exhibition Design, along with a semester exchange at RMIT, Australia; where he got major exposure to the power and various faces of weaving art, design and technology.

He has made art and design shows in Europe, Australia and USA since 2010. And along with this, he has been an educator. His journey as an educator began from HS OWL, Germany in 2015, and is currently working as a Digital educator at AMNH, NYC. Along with this he works at Fidelity Investment, NJ as an UX Designer.

References

1. E. Alpaydin, *Machine learning: The new A.I.* (Cambridge, MA: MIT Press, 2016).
2. S.J. Russell and P. Norvig, *AI: A Modern Approach.* (Boston: Pearson, 2016).
3. J. Perricone, *Melody in Songwriting: Tools and Techniques for Writing Hit Songs* (Boston: Berklee Press, 2007).