

Generative Music And Artificial Intelligence

By Thomas Park

Many different generative processes can be used while making music. One type of process involves the use of midi, or some similar programmable interface. Actual fractal or generative mathematical formulae can then be applied towards music creation. There were quite a few applications, many free, that worked in this manner back in the 1990's. Similar feasibility exists now in applications that are used in tandem with synthesizers, sequencers, and related electronic instruments.

A different type of functionality involves iteration. In one iterative model, a set of sounds is created before the piece is generated. The computer chooses sounds at random from these sets and loops them in real-time. This is a process I have used.

And, though the iterative process sounds simple, it has some advantages. Using a program to dictate tones, even where quantization is used, can still result in disorienting, out-of-place tones. A computer tends to output phrases that are dictated by code, rather than feeling. To my ears, generative music of this nature falls short in that the processor either periodically makes a decision a human would never make (or want to), or it sticks too closely within the confines of conditions that are overly rigid and simplistic.

Iterative composing by generative means, in fact, can be very flexible. The musician has complete control over possible sounds. To compose, silence is added before and/or after each sound using code (if the sound is to be intermittent). Code can be used to reduce the volume to an appropriate level, so that sounds mix. It can construct phrases that repeat, fading in and out. The code that renders the music can then be used to iterate random loops. The varying lengths of the loops results in varying interactions between them. The different volumes of the loops controls how prominent they are in the mix.

And, though it may seem that the musician is "not present" during iterative composition, in fact, the artist is there in every sound, every pitch. The composition is created using Brian Eno's analogy of gardening. The configuration for possible results is established and groomed by the artist, and the processor realizes this configuration, growing various possible iterations of it, which can be compared to flowers in a garden. Each is unique, though related. The gardener can choose which to use in a show and which to keep. Each is subject to the gardener's habit of planting and care. Each is the result of an organic situation created by the artist.

Which path will generative music take? Will processors simply spit out quantized tones from scratch? This still sounds interesting to me, but for some reason, I always know when I am listening to a computer. Their means of songmaking are distinctively non-human. I have heard some interesting results in which particular composers are studied, and their musical logic is

applied to generation. To me, pieces like these are really extensions of the original composer, and do a better job of reflecting the human creative impulse and means of listening.

The seemingly weaker brother, iterative composition, is the means of composing that I would like to see getting the most bandwidth. Combining coding with particular techniques, many borrowed from the musique concrete genre, results in pieces that are often quite organic, quite listenable. Done well, a person would have a hard time perceiving that the songs are generated, rather than mapped out sound by sound.

The iterative process has an interesting echo in the emergence of Artificial Intelligence.

With AI, computers are taught to learn, themselves. Questions emerge, such as, will the processor be instructed to learn in improvisational manners, and if so, to what degree? Isn't it possible that computers might make decisions that, like fractal midi, are jarring and lack human intuition and other qualities? And AI, for example, applied to save a corporation, might respond to the CEO's request to suggest how to double profits in 5 years with: "Fire 50% of all employees". If the solution was achievable this way, a computer would not "know" that such an answer would likely be considered not feasible.

If, however, AI was constructed to be a sort of iterative tool, problems like this might be avoided. What if AI only made decisions, created iterations, based on material that was supplied to it? What if it thought in terms of sample iteration and looping, rather than pointillist or abstract result? It is possible that we should "dumb down" AI in this way. AI could find ways to vacuum our carpets, to make sure our cars had fuel. AI could remind us of our birthdays, but only in ways that we would suggest (ie who would want their processor spend their money, out of the blue, to send them a singing telegram?).

AI, then, becomes an adept DJ, a disc jockey of situations, able to find, retrieve, and suggest elements and information as needed. The AI is an entertainer in that it presents possibilities in a series of shows, but does not enact them in a broader context. It is up to the human to choose, as with iterative works, which suggestion to enact, which generated possibility to realize. The human makes his or her choice of flowers, songs, or programs.

There are many possible paths ahead. It would be naive to conclude that which we choose will not affect our future(s). If a computer decides to start a nuclear war one day, and does so, those affects will be felt. If a computer helps us to keep our cities and homes clean and improve the environment, we will feel that, too. How much power we give AI has a metaphoric relationship with how much control we give to computer music generators. If we give them too much, we end up with results that are jarring to the human ear and mind. If we remain the gardeners, we can simply let the computer consider possibilities, based on our own set of choices, and go with what we best think-- using processors as tools rather than masters. The results will then be pleasing to the ears, pleasant to experience.