Research > COMPOSING WITH PROCESS: PERSPECTIVES ON GENERATIVE AND SYSTEMS MUSIC. Transcript

Generative music is a term used to describe music which has been composed using a set of rules or system. This series of six episodes explores generative approaches (including algorithmic, systems-based, formalised and procedural) to composition and performance primarily in the context of experimental technologies and music practices of the latter part of the 20th Century and examines the use of determinacy and indeterminacy in music and how these relate to issues around control, automation and artistic intention.

Each episode in the series is accompanied by an additional programme featuring exclusive or unpublished sound pieces by leading sound artists and composers working in the field.

PDF Contents:

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Joe Gilmore is an artist and graphic designer based in Leeds (UK). His work has been exhibited at various digital art festivals and galleries. His recorded works have been published internationally on several record labels including: 12k/Line (New York), Entr'acte (London), Cut (Zürich), Fällt (Belfast) and Leonardo Music Journal (San Francisco). Joe is currently a part-time lecturer in the department of Graphic Design at Leeds College of Art & Design. He is also a founder of rand()%, an Internet radio station which streamed generative music. http://joe.qubik.com

COMPOSING WITH PROCESS: PERSPECTIVES ON GENERATIVE AND SYSTEMS MUSIC #1. Transcript

The first episode investigates how music can be generated using a wide range of techniques. These range from very simple procedural systems, such as Mika Vainio's 'Twin Bleebs' which features two repeating events going in and out of phase, to David Tudor's 'Neural Synthesis No.9' – a more complex electronic system which explores indeterminacy through the emulation of neural activity. The programme also looks at music which has been composed using formal geometric and mathematical rules, for example: Martin Neukom's 'Studie 18' and Thomas Brinkmann's '27 Fibonacci Numbers in a Binary Chain'.

01. Transcript

Ø 'Twin Bleebs' (*Metri*, 1994, Sähkö Recordings)
Gullibloon 'Packets and Interrupts' (www.gullibloon.org, 2003)

We have just heard two pieces: 'Twin Bleebs' by Mika Vainio from the album *Metri*, followed by 'Packets and Interrupts' by Viennese collective Gullibloon. These pieces use systems to generate sonic and musical structures. Here the artists did not compose specific note events but instead considered the system that generated those events. In the case of Vainio this is simply two sounds that repeat slightly out of sync to produce shifting patterns. Whereas Gullibloon have developed a method for translating activity on a computer network into sound. This series aims to explore how rules, procedures and systems can be used to generate sonic and musical structures, and how different composers and artists have approached this field. We will look at how music can be generated by mathematical and geometric structures, biological systems and data from the environment. We will also look at the use of determinacy and indeterminacy in music and how it relates to issues about control, automation and artistic intention. The series will explore the impact of computer technologies and how these have opened up possibilities to a wider group of independent composers and sound artists.

In this first episode we would like to play a few examples of works we think are important or appealing, to give a sense of the kinds of pieces, themes and composers that we'll be looking at in greater detail in the following episodes. The following piece is by Martin Neukom and is called 'Studie 18.1'.

Martin Neukom 'Studie 18.1' (*Studie 18*, 2005, Domizil)

Part of a large series of studies these translate naturally occurring geometric patterns to musical parameters. Neukom uses the rules which govern the arrangement of seeds, leaves and thorns in certain plants to generate the pitches, spectra, time and location of individual sounds.

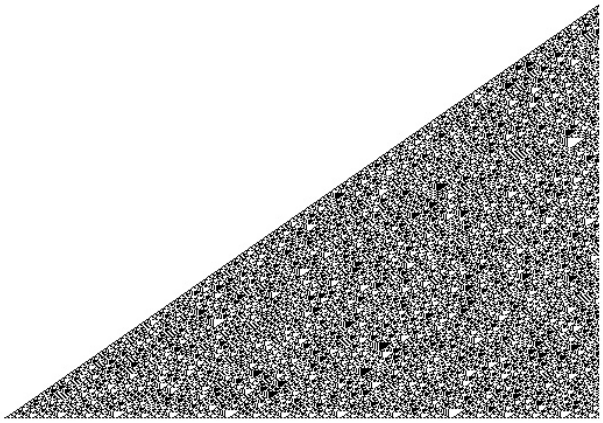
Let's hear another piece by Martin Neukom, this time 'Studie 18.9'.

Martin Neukom 'Studie 18.9' (*Studie 18*, 2005, Domizil)

In his '27 Fibonacci numbers in a binary chain' Thomas Brinkmann uses this series to generate rhythmic structures. Here each subsequent number is the sum of the previous two. Starting with 0 then 1, we get 1, 2, 3, 5, 8, 13 and so on. In the piece each is expressed as a binary number and used to trigger two different sounds.

Thomas Brinkmann '27 Fibonacci Numbers in a Binary Chain' (*Computer Music Journal Sound Anthology Volume 24*, 2000, CMJ)

That was '27 Fibonacci Numbers in a Binary Chain' by Thomas Brinkman.


[The first 511 terms of the Fibonacci sequence represented in binary]

This very determinate system can be contrasted to the work of the Greek composer and music theorist Iannis Xenakis, widely considered to be a pioneer in this field. As early as 1960 Xenakis had begun to compose entire pieces of music by computer using probability functions to determine the large number of events in his musical notation. This seemingly cerebral approach was, for Xenakis, in fact deeply grounded in nature.

Xenakis 'S.709' (*Electronic Music*, 2000, EMF)

'S.709' was composed at the Center for Studies in Mathematics and Automated Music in 1992. The piece was composed with a computer program called GENDYN using a compositional technique called General Dynamic Stochastic Synthesis which Xenakis outlined in his book *Formalised Music*. In stochastic synthesis both large scale musical structures and individual waveforms are generated using probability functions.

In this piece breakpoints are linked by linear interpolation. At each repetition, the last breakpoint of the current waveform is connected with the first breakpoint of the next variation of the waveform.

Now let's turn to another artist and one that we will look at in some detail later. Yasunao Tone was one of the first artists to explore the use of computers in sound and performance. Tone has done lots of interesting and pioneering work in this field and here we would like to play a piece from the CD *Musica Iconologos* where Tone transforms pictographic images directly into sound. He says "The picture of the music – the 'notation' – is what the music sounds like, and, if there is to be a picture, the picture comes first."

Yasunao Tone 'Jiao Liao Fruits' (*Musica Iconologos*, 1993, Lovely Music)

Working largely with treated field recordings, as opposed to synthesis in the case of Tone, Christophe Charles has developed a compositional method that he called 'undirected' here pieces are assembled according to indeterminate processes. Sometimes a system implemented on a computer designed to produce composite sonic textures where no one sound occupies the foreground. He called this a state of 'transparency'.

Christophe Charles 'Mobile Opinions' (*Undirected / Dok*, 2000, Ritornell)

That was 'Undirected Dok' by Christophe Charles

During the 1960s David Tudor was one of the first composers to reject composing electronic music for tape, focusing instead on the production of live electronic music using modular electronic technologies. *Neural Synthesis Nos. 6-9* should be primarily understood as performative. Recordings of the work, as they appear on CD, should therefore be understood as documentation of performance. Here the performer is an integral part of the system that forms the work, which in this case also includes a neural network synthesiser developed for Tudor by Forrest Warthman, Mark Thorson and Mark Holler. The synthesiser is a matrix of digital switches and oscillators which are intended to emulate neural activity.
Tudor's performances, which consisted of custom-built or modified networked devices, are intended to disrupt what could be considered a 'traditional' performance paradigm: one of skill and mastery of instruments. Although we can clearly argue that Tudor's performance technique was extremely skilled, we should acknowledge that this occurs within the context of exploratory relationships between the performer and his instruments. Here the performer does not have a predictable one to one relationship with his instruments, and is instead not always aware of what will happen as a consequence of his operations within the system.

David Tudor 'Neural Synthesis No. 9' (*Neural Synthesis Nos. 6-9*, 1995, Lovely Music)

02. Acknowledgements

Written and edited by Mark Fell and Joe Gilmore. Narrated by Connie Treanor. Recorded at The Music Research Centre, University of York, UK. New Aesthetics


[Iannis Xenakis]

in Computer Music research project funded by the Arts and Humanities Research Council UK.

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