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Cyberpunk Beginnings: SOS

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Abstract

This performance proposal features works for electric guitar, percussion, live processing and visuals performed by Mark Zanter, and Steve Hall of Marshall University, USA. Approximate time 10 minutes.

SOS integrates layers of algorithmically generated material, live signal processing, visuals, and live performance in a work exploring boundaries between machine generated sound(s), and human interaction.

Key words: improvisation, modular form, algorithmic composition, signal processing, hz

Introduction:

Cyberpunk beginnings: SOS is part of a larger project/work integrating algorithmic processes, live performance, improvisation, and visuals in a context that explores Cyberpunk themes, icons, structure/flow found in the writing of William Gibson, Philip K. Dick and influenced by the philosophical writings of Baudrillard, Lanier, and Featherstone. Though these themes and concepts have been with us for some time now, it is my belief that the age proposed in Cyberpunk literature—once a fantasy—will soon be upon us as AI, corporate capitalism, and the integration of biological physiology and machines (cyborgs) have increasing relevance in our day to day lives.

One of the themes in Oshii's *Ghost in the Shell* is that technological advances will occur regardless of their benefit to humanity, and thus humanity must learn to cope with technologies [1]. *SOS* and it's structure focus' more on coping or collaboration between the performers and the computer generated parts rather than various and very important ethical issues surrounding new technology and its use. Further, the simplicity and ordinariness of musical and visual materials used in the piece elevate the interaction of parts and performer reactions in performance [2].

In *SOS*, I have used algorithmic procedures to produce music notation, electronic sounds, and visuals that are integrated into the whole. Elements are introduced individually at first, and then combined as the work progresses using increasing levels of interaction/reaction between the performers and computer-generated sounds. Performer roles vary, being more or less foregrounded with regards to the computer parts; in general, computer-generated parts become increasingly important as the work progresses [3]. Pitch, rhythms and tempi were chosen to afford congruence of sound, and high degree of flexibility for the performers in varied musical contexts.

Music composed for the performers uses a 2n additive sequence and rotational permutation using (c-e-f#-g-b) hemitonic scale [1] [4]. Fig. 1 shows the rotational scheme, and figs. 1-3 show its transposition and embellishment as it is transposed from c3-b6. In each example, 2n occurs once on each system, and the rotational sequence occurs over the course of four systems.

figure 1

Successive repetitions of the schema begin with pitches 2-5 of the scale (2n rhythmic sequence, pitch rotation sequence). As the schema is transposed, diminutions are employed mm. 80-200 heightening the expressive nature of the line as it moves into increasingly higher registers (e.g. figures 2, 3).

figure 2

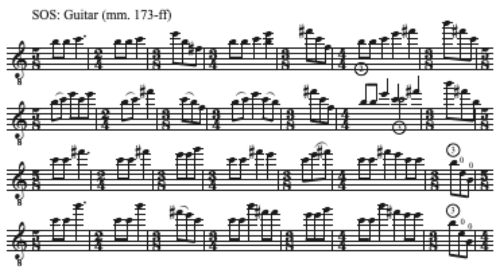


figure 3

Sustained pitches, chords, open strings and other devices were added to the guitar part making it more expressive and idiomatic for the instrument.

This composed music is performed with computer generated sound at a tempo relationship of 63/173.4 bpm. This relationship, 11:8, synchronizes the faster music of the performers with the slower pitches of the bass voice every 5.7 seconds; the length of one 2n cycle (16 beats). 11:8 polyrhythmic relationship creates rhythmic/metric tension between the performers and computer-generated sounds. This tension is resolved after m. 230 when all agents perform at a tempo of 126 bpm.

MIDI pitches and rhythms were generated in Max/MSP and played through synthesizers in Ableton Live [5]; which also performs additional signal processing. The Max patch contains four voices (STB) and percussion that send

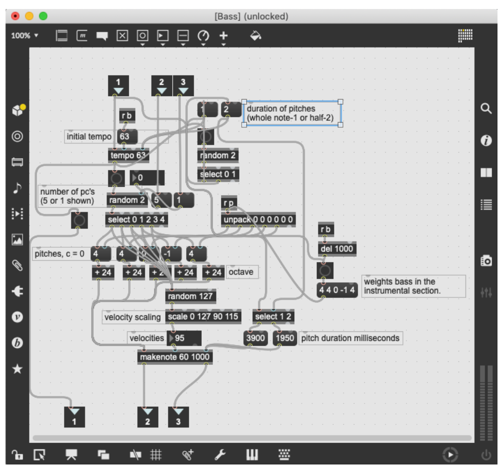
MIDI data to Ableton. The patch dictates tempi, pitch, velocity, density and cardinality [2]. Bass and tenor use 63 bpm, higher density and lower cardinality, while soprano and percussion use 126 bpm, and wide-ranging density, and cardinality [3].

Pitches are generated randomly from subsets of the scale input to each voice. Bass, tenor and percussion sound first, with the written score. In this section bass pitches are weighted E-60%, B, C-20%. Pitch weighting causes the perception of a double tonic (Em, C) to emerge [6]. The tenor moves from low density and high cardinality to high density and low cardinality at which point the performers enter. In this section, the computer-generated percussion adds rhythmic tension playing off the music of the performers. At m. 230, the soprano enters, and gradually moves towards 83% density. Percussion density also increases here to 50%. Collections shown below are then triggered in sequence, at a rate dictated by duration of pitches in the bass. Closer examination of collections shows the following "chords": CMaj7-Em9-F#ø7(11)-Em9/G a sequence with many possible functional interpretations (figure 4).

At this point improvising performers are free to interpret pitch collections as harmonies or as groups of unequal four member subsets derived from the original pentatonic scale. Both approaches will render different results and the style of improvisation may closely emulate the computer-generated music, or venture into different territory at the discretion of the performer. The tempo in the section of the work is 126 bpm, and the quick rate of the soprano sounding with the slower tenor and bass creates the impression of fast arpeggios over a ground bass (c-e-f#-g).

figure 4

Figure 5 shows the bass voice of the patch and objects that control output. Each voice uses a similar structure. Tempi and note value control the rate pitches are triggered while the random object selects the number of pc's [4] that will sound (5, 1 shown). Values 1-5 produce 100% density of 1-5 pc's, while values x>5 produce lower density (e.g. 6:5 = 83%). Note, durations are not specified except for the bass. Velocity scaling shapes accents for each pitch adding rhythmic texture to each voice. This is most noticeable in the soprano and percussion voices [7].



Visuals used for the piece were created by processing a photo in Max/MSP. Values for scale, hue, saturation, number of repeats, xyz rotation and waviness (LFO) generated the graphics from a photo of a common household object. The 2n series was used to change values over time and in each section certain parameters take precedence.

Notes:

[1] 2n sequence relates to the number of pitches: 1+1; 1+2; 1+3 etc. Rhythms do not strictly follow. The last rhythm of each sequence is 1.5 duration of the others.

[2] Cardinality: the number of pitch classes.

[3] Slower and fewer pitches in the bass, faster and more pitches in the soprano and percussion.

[4] Pc's: Pitch classes.

References:

[1]https://www.scmp.com/magazines/post-magazine/arts-music/article/3040516/why-ghost-shell-greatest-and-most-philosophical (accessed, November 3, 2020)

[2] Baudrillard, Jean, and Lotringer Sylvère. *The Conspiracy of Art : Manifestos, Interviews, Essays*. Semiotext(e), 2005.

[3] Butler, Mark J. *Playing with Something That Runs: Technology, Improvisation, and Composition in DJ and Laptop Performance*. Oxford University Press, 2014.

[4] Silverman, Joseph H. *A Friendly Introduction to Number Theory*. Pearson Education Taiwan, 2004.

[5] Manzo, V.J, and Will Kuhn. *Interactive Composition: Strategies Using Ableton Live and Max for Live*. Oxford University Press, 2015.

[6] Drew Nobile, Double-Tonic Complexes in Rock Music, *Music Theory Spectrum*, Volume 42, Issue 2, Fall 2020, Pages 207–226, https://doi.org/10.1093/mts/mtaa003

[7] Rowe, Robert. *Machine Musicianship*. MIT Press, 2001.