Refraction Interlude: piano

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1. PROGRAM NOTES

"Refraction Interlude" is an interactive environment for live performer and transducer-activated metal percussion instruments. This work fuses performer-centered free improvisation/creative music approaches with the instrumental-acoustics based orientation of reembodied sound. Reembodied sound refers to the electroacoustic practice of using tactile transducers to project sound into resonating objects, thereby turning these objects into a kind of speaker. Designed in Max and combining performer-sourced pre-recorded sounds, real-time input analysis, and mixed synthesis targeted to the acoustic properties of the metal percussion, the system follows an independent set of algorithms in response to performer input. These processes facilitate adaptable sound worlds that allow significant creative construction by the performer in balance with the acoustic agency of the metal percussion instruments. This iteration of the work is a new realization for piano.

Figure 1. one possible stage configuration for *Refraction Interlude: piano*

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2. PROJECT DESCRIPTION

This interactive work is for any instrument and a responsive system of four transducer-activated metal percussion instruments. The performance setup is relatively simple: the performer is center stage and plays into a microphone. This signal is sent to a computer running for processing, and the resultant signals are sent out through an interface to set of amplifiers, and then out to tactile transducers which are attached to the surfaces of the metal percussion instruments.

The interactive portion of the work is programmed in Max/MSP. The interaction parameters were kept simple, utilizing a few basic processes to balance performer control and systemic independence. Three pre-performance preparations are required: 1) a corpus of samples created by the performer, 2) a dictionary containing a spectral centroid analysis of the grains within the sample corpus, 3) a dictionary containing partial frequency content for each of the metal percussion instruments.

Input from the performer is analyzed for both its spectral centroid and onset timing. This analysis then governs the selection of grains from the sample corpus. The output from grain playback is panned between the four internal instrument channels for individual processing. Within each channel, the output of the granular playback is split, with one iteration sent in a parallel process to be resynthesized in a manner which tailors it to the acoustics of the designated metal percussion instrument. The resynthesized grains are then sent through a set of cascading resonant bandpass filters or resonant models. A simple algorithm governs the evolving mix between the two streams of direct and resynthesized/filtered playback in all channels. The results are then sent to the transducers attached to the metal percussion instruments to be sounded in the performance space.

Performance time: 6-8 minutes.

3. PERFORMANCE NOTES

Instrumentation:

Grand piano (with ability to play inside)
24” Sound Creation Gong
22” Symphonic Gong
21” Wind Gong
18” Wind Gong

The composer will play the piano and run the electronics from an onstage laptop.

Stage Setup

In small spaces, the metal percussion instruments are typically spatialized to the sides (and sometimes rear) of the audience. However, the work is adaptable and in larger spaces all instruments can be onstage. Additional accommodations can easily be made for streaming and/or documentation needs.

Instrument amplification

Whether the instruments will need amplification will depend on the size of the performance venue. The volume is generally low, so the metal percussion and piano may need to be amplified through the house system if the performance space is large, and/or for online streaming.

If venue determines that instruments need to be amplified due to performance space size or live streaming, the following are recommended:

- 2 piano mics
- 4 cardioid microphones, 1 per gong, to be placed behind instrument (rear face)
- Stereo panning in house system is recommended
    - Multichannel spatialization of sound is not required unless instruments are placed around audience.

4. MEDIA LINK(S)

Links are to performances by Georg Wissel on clarinet.

- Audio: https://matthewgoodheart.bandcamp.com/track/interlude
- Video: https://www.youtube.com/watch?v=5rjZUT3B7rk

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