SCHMITT

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1 PROGRAM NOTES

Schmitt is a quadrophonic live-electronic music performance. The piece meant to challenge and explore the relationships between motion, gesture and music in a multi-channel speaker setup. Along with that the narrative of the performance is about overcoming existential crisis, which is translated into a sonic journey. The main symbol is a self-made square wave Schmitt oscillator, which is the sound source throughout the whole piece. The development of the oscillator's timbre is the transformation of the narrative.

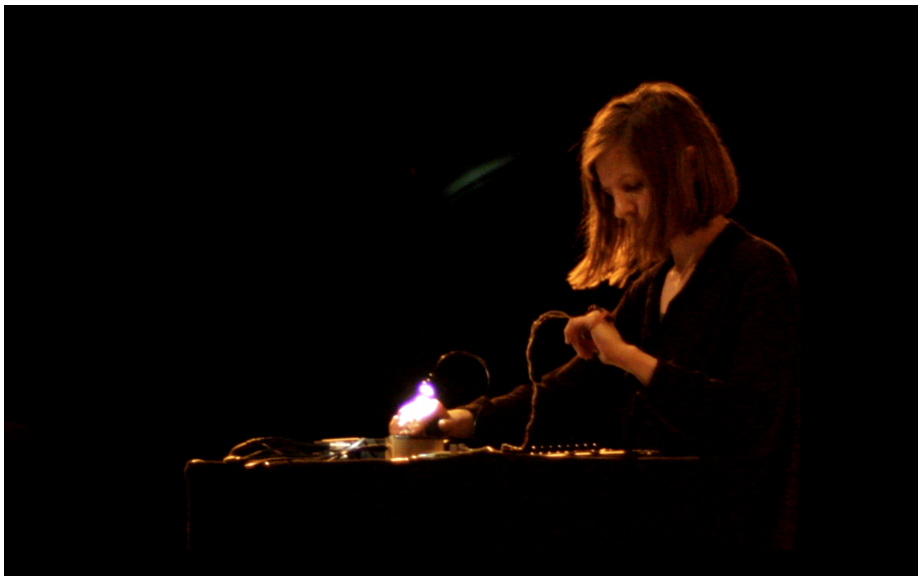

Fig. 1. Schmitt performance picture

The piece is also questioning a certain issue behind using self-made instruments or controllers compared to the use of traditional instruments. It is strongly connected to a reference point (expectation) of how the players gestures on the instrument are coordinated with the sounding outcome.

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2 PROJECT DESCRIPTION

The Schmitt oscillator works with light-dependent sensors, which creates a strong relationship between hand gesture (shadow) and the sound itself. In addition to that there is an accelerometer sensor attached to the hand, which creates the shadow on the light sensor. The accelerometer is controlling the signal processes of the Schmitt oscilattor's sound in other words it changes the timbre of the sound source. Along with that the accelerometer sensor also defines the spatial position of the sound and it projects it in different points in space in contrast to the sounding drone texture.

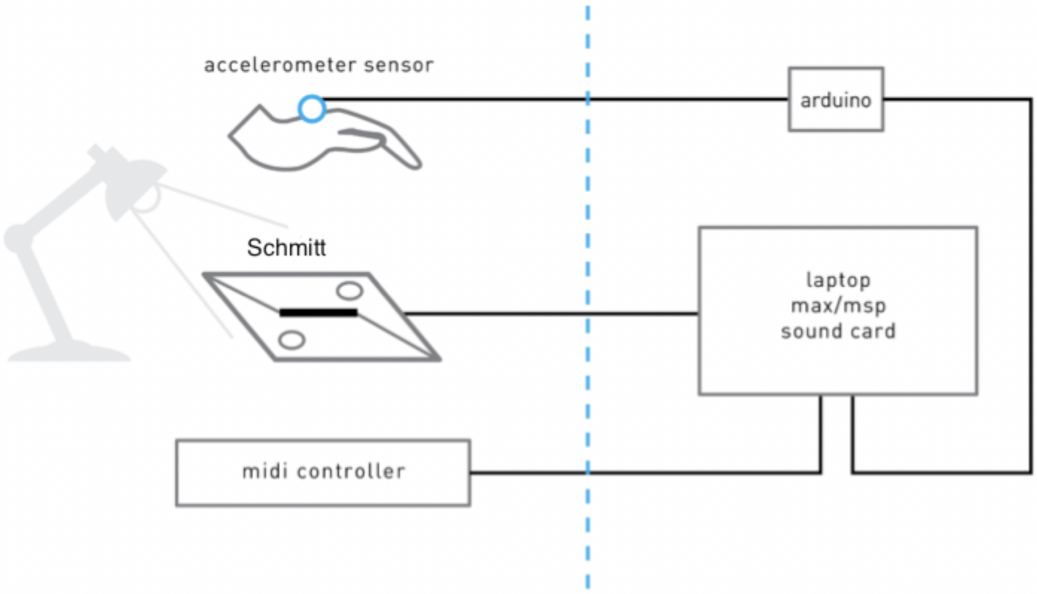

Fig. 2. Control mechanism of the instrumentation

With a reference point of gestural movement, one can be engaged with the specific events on a holistic level, as it is the most important is to be able to judge with knowledge and comprehension. For example plucking a string on a guitar is not the same as pressing a key on a midi keyboard or turning a knob on a controller. Plucking a string has its own very specific world and will always have an identifiable behavior. The music culture adapted the nature of the instrument, the gesture that needs to be used to execute it and the sounding result of the process. There is a strong relationship between the performers choreography (gestures) and the sound result.

However when we are talking about DSP processes, which are combined with external controllers in order to enable an interaction with the sound, physically, the black box phenomena appears in music. It no longer enhances the choreography of the player.

There is no knowledge of the tools internal working principle. So it is easier to get alienated from the performance if one cannot find any reference points between the actions and sounding result. This problem doesn't only concern the audience member but also the performer, in the sense that that performer can no longer access its body's potentials to

deal with the sound.

That is why in the piece of Schmitt the chorographical design of the performative tool is essential to both the performance and the composition. It meant to create a set-up where the relationship between the sound source and the DSP processes are understandable to a degree where one is able to play with this dimensions of its expectations.

As mentioned the essential motor and the inspiration of the composition of the performance was the Schmitt oscillator. The mechanism of the circuit itself is simple which is the strength of the instrument as well. The technical name of the circuit called Schmitt trigger oscillator hence the title.

The Schmitt-oscillator has two small sensors to control the frequency and the trigger rate of the signal. The oscillator generates a simple square wave. It works with two light dependent resistors (LDR), meaning that the frequency and the trigger rate depends on the light circumstances around the sensor. With the shadow of the hand on top of the both LDRs creates a low frequency wave with a slow trigger rate and in full light a high frequency wave with a fast trigger rate.

The goal in the piece is to acquire a deeper understanding about its limitations and characteristics. Having this bottom approach there is a more in depth overview where the device increases its capability to be a performative tool. Playing on it like a traditional instrument made it feel free and comfortable when the performing takes place and easier to be able interpret its behavior.

That is also how partly the narrative got together. In order to reborn one needs to destroy the existing world. To develop one needs to change sometimes to its core. How to keep one's core characteristic but still reborn in a higher state? These reflections and the oscillators behavior shaped the piece and the development of the instrumentation.

However it can be risky task to expand with external controllers of the sound source. As it was stated before the peformative tool needs a strong interconnection between the original sound and the processed sound. It was important to keep the aesthetics of a direct relationship between the sound and the physical motion, even when the original sound is highly distorted. Hence the conclusion of attaching an accelerometer sensor on one hand, so that it is not only the shadow of the hand modifying the Schmitt oscillator sound but also the position of the same hand. A Max Patch was created with ring modulations, feedback systems, delay lines, filtering, pitch-tracking and Karplus-Strong processes.

With the accelerometer sensor I was able to change the textures of the oscillator and still keep the physical relationship with the tool. The accelerometer sensor had two functions: 1) interpolating between the textures of the processed sound (the input signal is always coming from Schmitt oscillator); 2) moving the sound between the speakers. Once having finalized the environment of the Schmitt oscillator, the next step was to compose the sound processes of the MAX Patch.

The Schmitt oscillator is never silent throughout the performance. It is the inner motor, constancy of the piece, much as a living organism that is going through transformation.

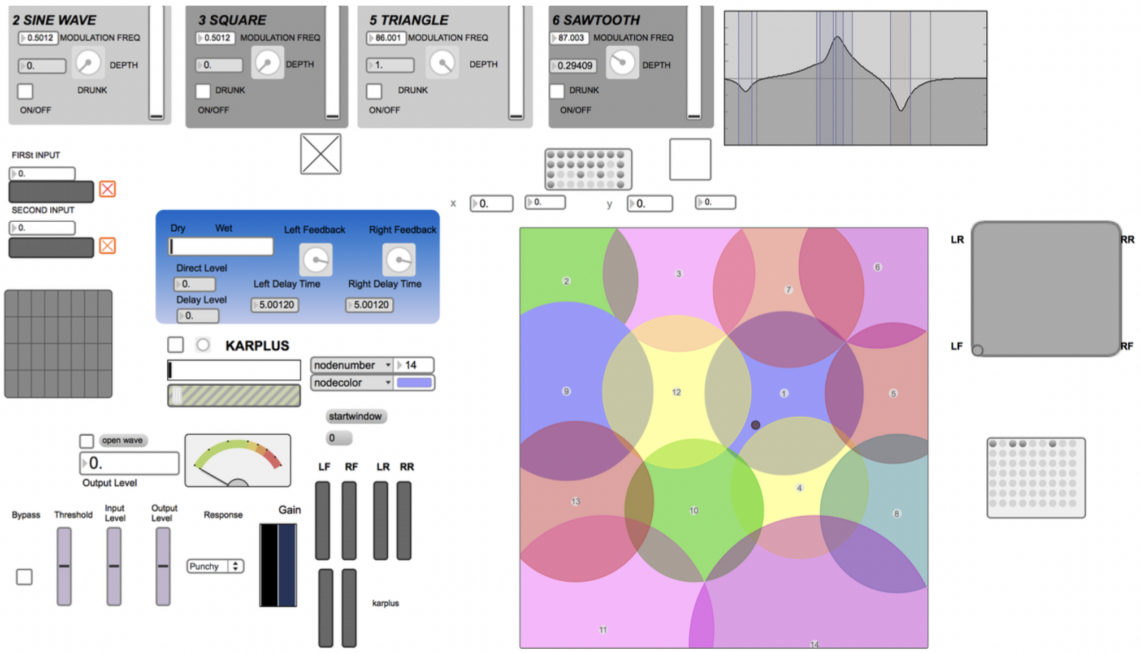

Fig. 3. Max Patch

3 PERFORMANCE NOTES

Schmitt is a 10 minutes long quadrophonic live-electronic music performance. The narrative of the piece is about overcoming existential crisis and rebirth. The instrumentation is focused on a self-built Schmitt oscillator which sound transformation is the sonic journey of the piece. The control mechanism of the signal processes happens with accelerometer sensor to emphasize and strengthen the gestural choreography with the Schmitt oscillator. Along with that the sound source's signal is is being projected into a multichannel-speaker setup representing its liveliness and its journey throughout the piece while it is simultaneously contrasted with drone textures.

4 MEDIA LINKS

- Video: https://vimeo.com/295334557