Sonic Drawings

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Sonic Drawings is a performance which explores sound and visual generation through an interface which enables real time sonification of drawings on a paper canvas with graphite pencils and conductive ink circuits. This approach also allows the introduction of a series of open computer vision techniques to augment the experience of traditional drawing through new media technologies. Finally we expect to enable users to experience an intuitive interface that responds according to drawing interaction.

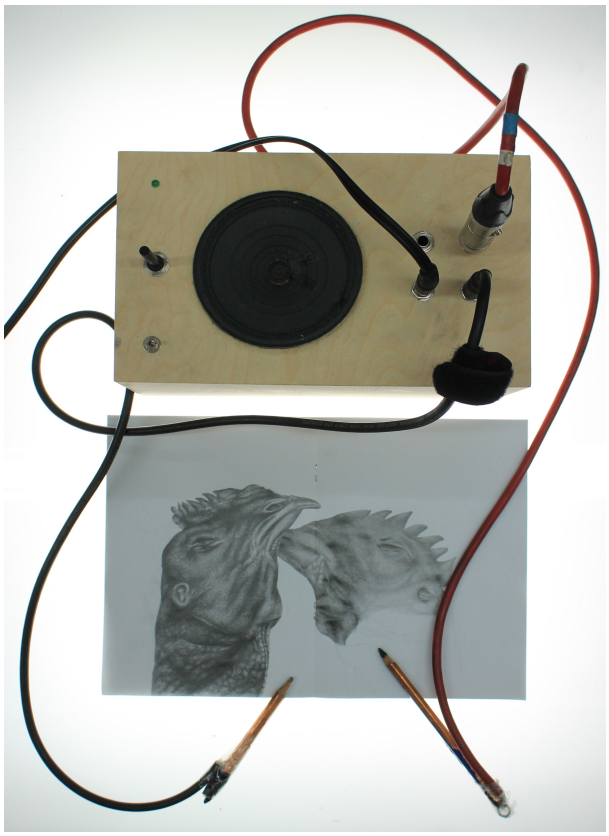

Fig. 1. Overview of the interface

Feedback Oscillation for Sonic Interaction

As a primarily source of feedback for interaction, we have implemented an electronic oscillator circuit which modifies its own pitch by measuring the electrical conductivity through the graphite traces along the canvas. The amount of resistance applied on the circuit's feedback points increases frequency of the oscillation of the output signal, and the listener perceives this as a change in pitch. The number of feedback points and their possible combinations allow more sets of pencils or inputs for the conductive ink circuit on the paper. The signal obtained from this circuit is further processed digitally, and is treated

as a valuable asset for sound synthesis and visuals generation.

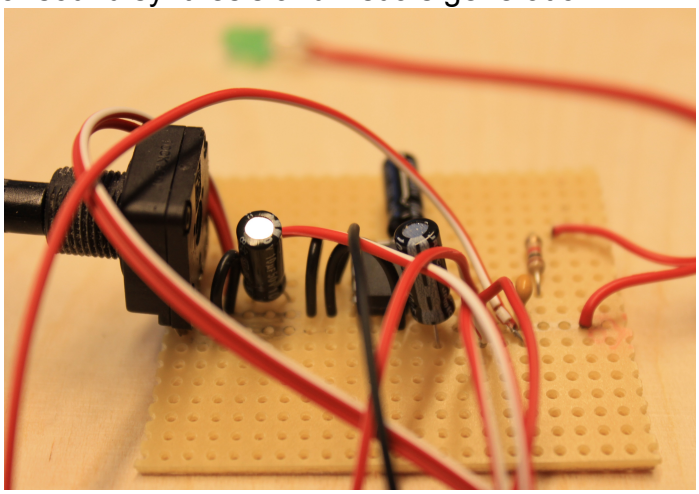

Fig. 2. Detail of the circuit for amplification and feedback oscillation

Software for Signal Analysis and Motion Tracking

Additionally, Sonic Drawings combines the signal from the conductive graphite with image analysis through custom-made software. This software obtains input data by tracking the hand positions of the performers through a camera. Furthermore, the tracking of the hand can provide data about the speed of the hand gestures. In this way, the system evaluates different states of the performance to trigger and shape the audiovisual composition. This set of tools aims to allow interaction with digital sound modules based on Pure Data patches and other live electronic instruments, such as complementary analog oscillators and other external synthesizers used to play during the performance.

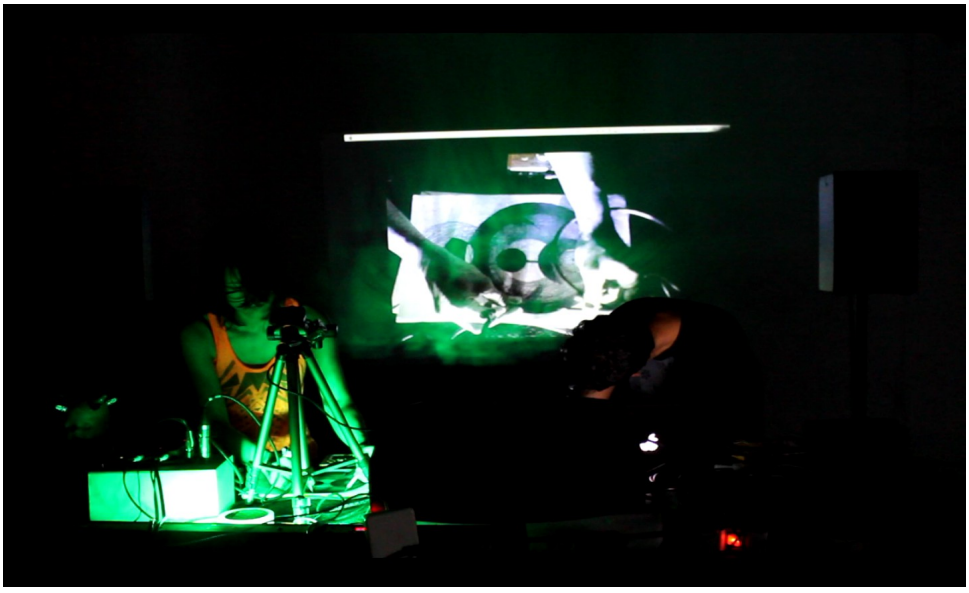

Fig. 3. Computer software for motion tracking and visual processing of elements drawn.

Generative Visuals and Sonic Outcome

The audiovisual output presents a direct relationship between the drawing gestures and a the sound instrument manipulation.

A bundle of data obtained from performers interaction modifies parameters of a set of FM synthesizers. These synthesizers create a signal according to the material drawn during the performance. Simultaneously, the software generates live visuals with content sourced from both the camera and sound inputs, where live video processing, particle systems and geometric figures projected on the stage create a certain level of synesthesia for the audience.

In this way, the live performance unfolds along different stages, generating sound and visuals along an interaction concept which suggests a sonic drawing, with an aesthetic orientation could be described as experimental, minimal live electronics and audiovisual immersion.

Artistic Context of the Project

The idea of sonic augmentation from the act of drawing has been realised earlier by other artists who either applied similar technical approach towards Sonification of Live Drawing. Among others, it is worth mentioning the 'Ground' project by Dewi Devree, Donia Jourabchi and Jeroen Uyttendaele.

Sonic Drawings is developed in collaboration between two artists from audiovisual media, focused on live performance that embraces both traditional fine art drawing method with a music technology approach. Through the fabrication of our own analog and digital instruments and their live manipulation, we strive to explore the possible relations between sound and visuals.

Project documentation:
http://www.juanduarteregino.com/Spells-Disaster-1
http://www.anagutieszca.com/Arta-Spells-Disaster

Video:
https://vimeo.com/103660850

Technical requirements:
Projector, sound system, table, space for projection on a wall behind us.
The setup mostly fits the look of the video included in this submission.

Biographies
Juan Duarte Regino is an audiovisual artist from Mexico City. He is currently completing the MA in New Media at Aalto University in Helsinki, Finland. His artistic work and research is related to sonic interaction design, physical computing, custom made electronics, live visuals and sound coding. He is a co-founder of Third Space; a gallery located in the center of Helsinki where curates the Sound Room project.
http://juanduarteregino.com/

Ana Gutiérrez (Gutieszca) is a visual artist from Monclova, Mexico. She is currently completing the MA in Fine Arts at Aalto University in Helsinki, Finland. Her work is centered in the field of drawing as a contemporary artistic practice and its deconstruction through performance and sound art. Her background is in visual arts but her projects tend to connect with music technologies and interaction features. She is a co-founder of Third Space; a gallery located in the center of Helsinki where curates the Sound Room project.
http://www.anagutieszca.com/