

Sonic Drawings

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Sonic Drawings is a performance that explores sound and visual generation through a custom made interface that enables real time sonification of drawings created on a paper canvas with graphite pencils and conductive ink circuits. This approach has permitted to introduce a series of open computer vision techniques to augment the experience of traditional drawing. The outcome of the performance expects to create a meaningful experience by using an intuitive interface that responds accordingly to performers interaction.

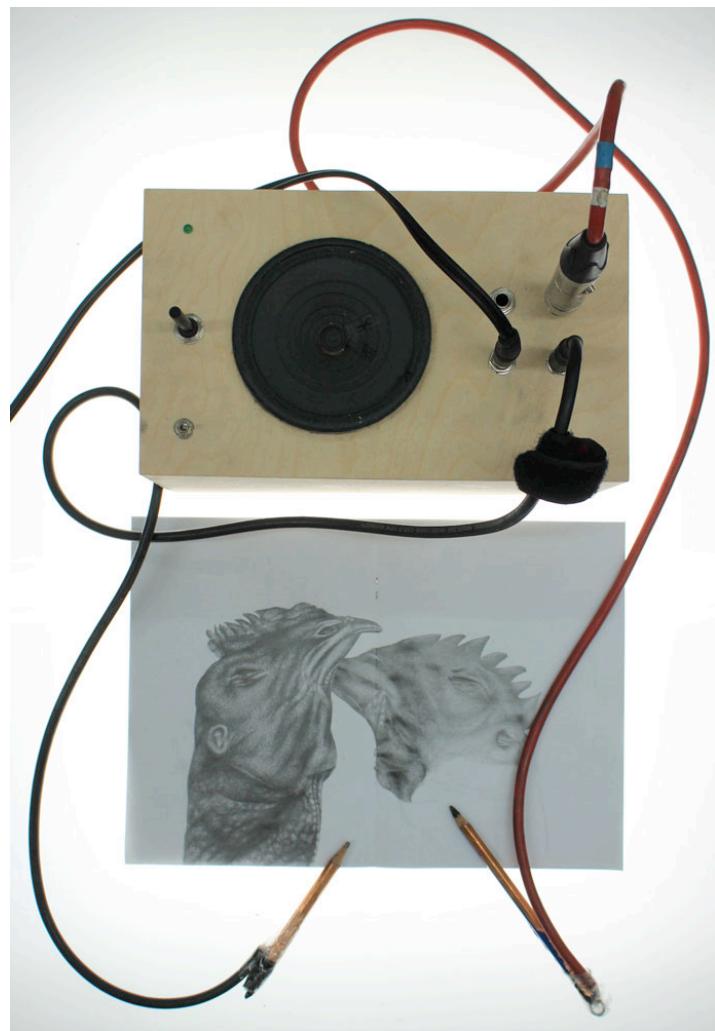


Fig. 1. Overview of the interface

Feedback Oscillation for Sonic Interaction

An electronic amplifier circuit was implemented as a primarily source of feedback for sonic interaction. The circuit is used both to amplify the signal and to generate different frequencies depending on the electrical conductivity produced from using two graphite pencils to draw along the canvas. These two opposite pole pencils create a feedback in the amplification circuit. Hence, depending on the amount of resistance applied on circuit's feedback points, user can increase or decrease the frequency by dragging pencils closer or further.

During the sonic and visual performance a wide variety of frequencies are produced when the interface is used to draw along different traces of more or less amount of graphite or conductive ink. The number of feedback points and the possible combination of electronic components of the circuit may also open the possibilities for sonic outcome. The obtained signal from the circuit is processed and analysed with a patch made in Pure Data, also simultaneously with a kaoss pad instrument. The signal from the circuit is used as raw material to create more advanced sound synthesis and visuals generation from it. The patch made in pd consists of a series of FM synthesis modules that process the incoming signal from the circuit and is modulated against the data obtained from the movement tracking with a camera facing the drawing surface. A kaoss pad is used to sample and loop fragments of the sound obtained during the performance.

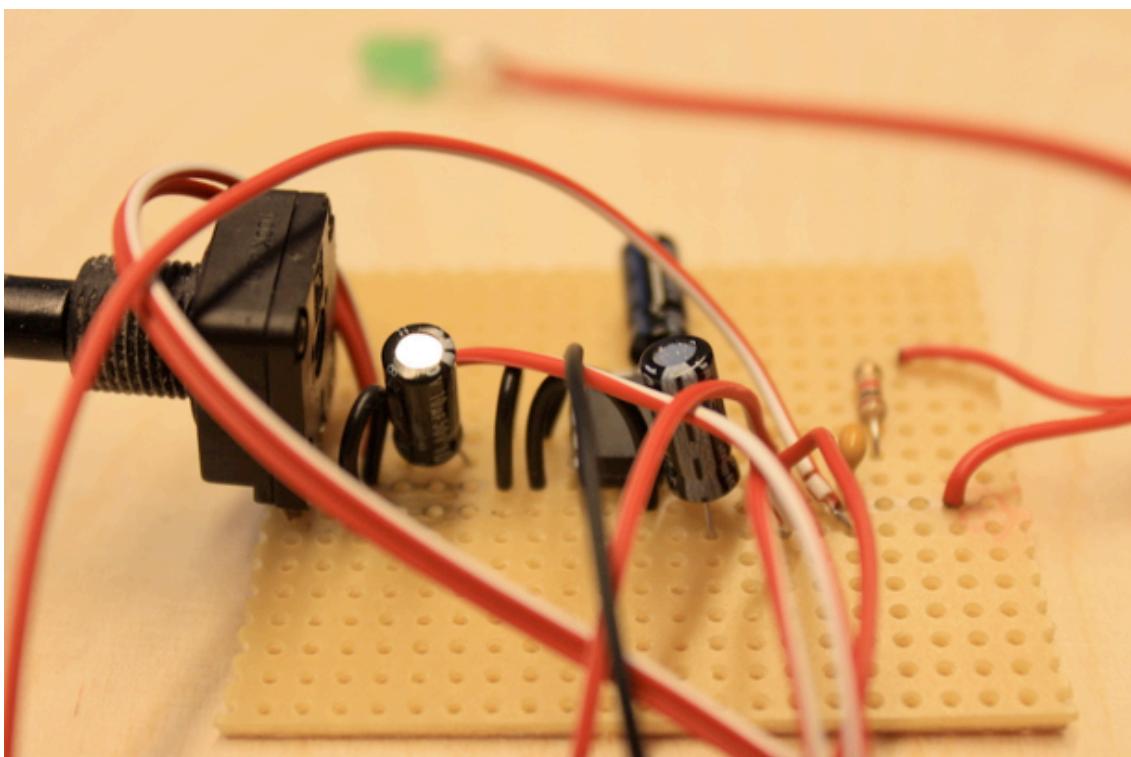


Fig. 2. Detail of the circuit for amplification and feedback oscillation

Software for Motion Tracking

Two computer vision techniques are used during the performance: background removal (to register changes compared from the initial frame and every new drawing is presented in front of the camera), and multiple blob tracking, to obtain data from position movement. Thus input data from tracking hands position is obtained continuously during the performance. Furthermore, the data obtained from tracking can provide information from the speed and trajectory of the hand gestures. Consequently these gestures can create different states that support performance flow while triggering events that persuade performers to shape the performance as a composition.

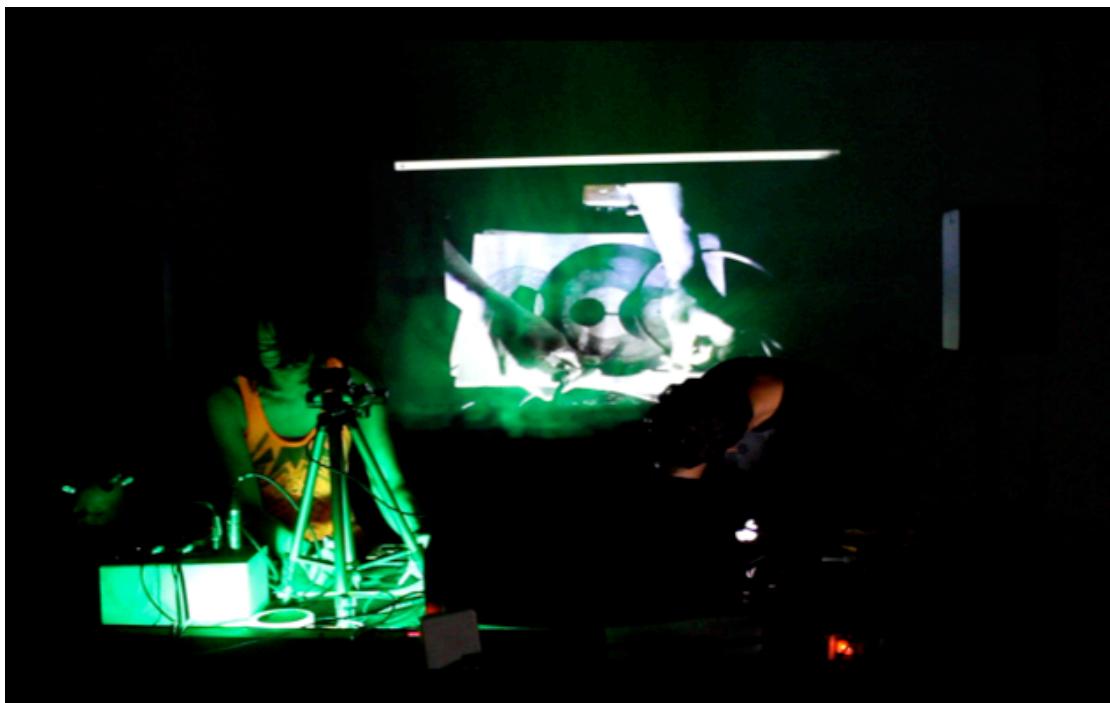


Fig. 3. Computer software for motion tracking and visual processing of elements drawn.

Performance Development, Generative Visuals and Sonic Outcome

In order to emphasize the aesthetic approach of a traditional fine art technique, a detailed part of the drawing is prepared before the performance and finished throughout the performance duration. As a starting point, the oscillator circuit is triggered by touching the drawing with both graphite bars which release the first audio signals, the later sound processing is introduced gradually as layers that end up generating an ambience of both recognisable and indirect sound manipulation.



Figs. 4 and 5. Drawing before and during the performance.

Finally the audiovisual outcome seeks to connect drawing performance with playing a sound instrument. The later part of the performance consists of generating live visuals with content sourced from both, the camera and sound reactive visuals. Video processing, particle systems and geometric figures are projected on stage merging with the drawing as the performance unfolds to create a synesthetic experience. The aesthetic choice of the visuals is oriented towards experimental, minimal live electronics and audiovisual immersion.

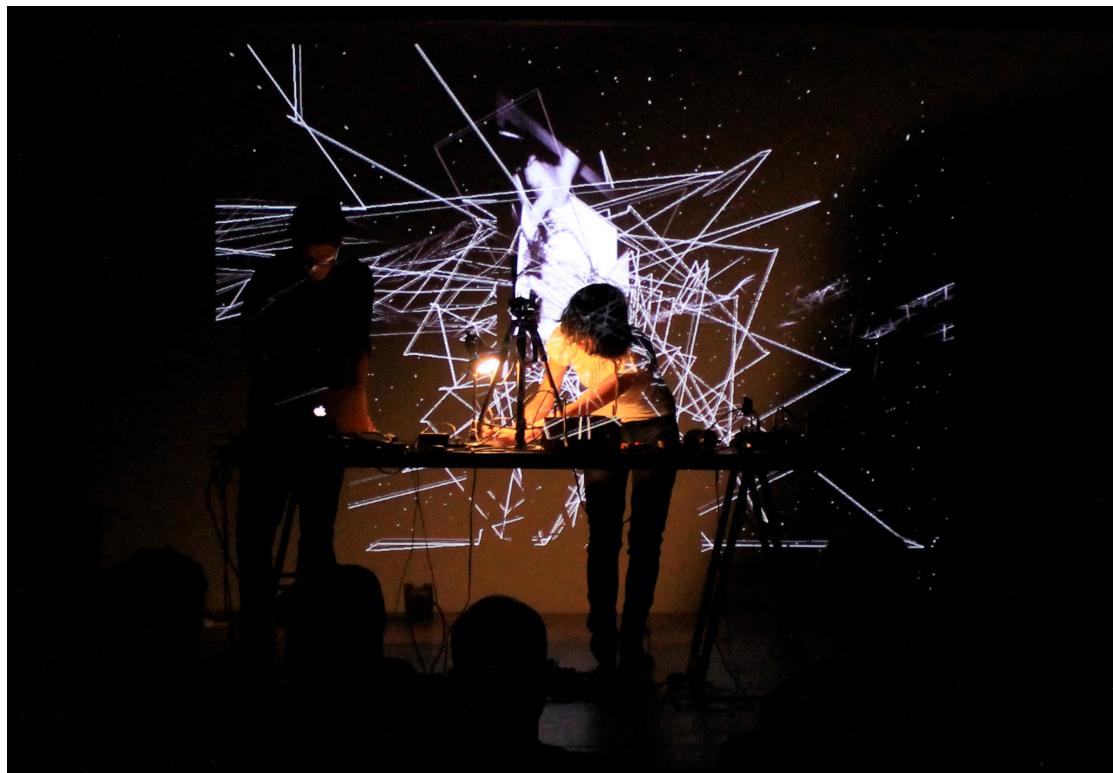


Fig. 6. Advanced stage of the audiovisual performance.

Artistic Context of the Project

Sonic augmentation of drawings with similar techniques has previously been realised in projects such as 'Ground'¹ by Dewi Devree, Donia Jourabchi and Jeroen Uyttendaele.

Sonic Drawings is developed as a 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 presented at:

- 2015 Centro Cultural Casa Purcell. Saltillo, Mexico. (Workshop & performance)
2014 *INTER-FACE International Conference on Live Interfaces*. Galeria Zé dos Bois. Lisbon, Portugal.
Sound Room X. Kultuurikatla Aed. Tallinn, Estonia.
Sound Room VIII. Vapaan Taiteen Tila. Helsinki, Finland.
BiteVilnius. Dailininkų sajungos galerija. Vilnius Culture Night, Lithuania.

Documentation:

- <http://www.juanduarteregino.com/Spells-Disaster-1>
<http://www.anagutieszca.com/Arta-Spells-Disaster>

Video:

- <https://vimeo.com/115295015>
<https://vimeo.com/103660850>

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 (Ana Gutieszca) is a visual and sound artist from Monclova, Mexico. Her work deals with drawing and its deconstruction into sound in performance art. Her background in visual arts has influenced her approach to the sonic field, where explores the acoustic qualities of drawing through the sonification of graphite, and the creation of analog and digital instruments. She is a co-founder of Third Space, a gallery located in the center of Helsinki where curates the Sound Room project and is currently completing the MA in Fine Arts at Aalto University in Helsinki, Finland.

<http://www.anagutieszca.com/>

¹ 'Ground' documentation website: http://www.dewidevree.org/site/projects.html#006_Graf