being-with, seeing-with, hearing-with

Proposal for: Everywhere = Nowhere = Now
Sarah Al Mamoun & Maxime Gordon

documentation website

being-with, seeing-with, hearing-with is an interactive sound and light system and performance piece for 2 people that utlizes data from the body to create a dynamic sound/lightscape. In this work we are primarily concerned with notions of trust, collaboration and the often hidden effort it takes in maintaining equilibrium in relationships. Through sound and light we aim to expose the inner and underlying effort it takes to reach this equilibrium.

RESEARCH QUESTIONS

(1) Think of a context and an environment where you would like to intervene. Where will you present your project? Who is it made for?

This project is being developed for presentation in a gallery setting. Audience members watch and listen as two performers (Sarah and Maxime) perform the piece. The piece and hardware/software is being developed specifically for these two performers. The performance is an intimate look at force and tension between us (the performers) and technology. The hardware and software is being specifically built for us as we are the site where all interaction occurs. Our bodies will be a large part of the design process as we will have to measure and tune data from ourselves to send to various audio and lighting paremeters.

(2) Think about the kind of relationship you wish to foster among and between your users and the artifact or installation. What will your project afford users and how would the experience make them reflect on themselves, their environment, society and your intentions?

This project is about balance, equilibrium and fostering a sense of connectedness between the performers/users. Users are asked to balance each other's weight precariously through a rope adorned with LEDs - only once stasis and balance is achieved will there be a 'meaningful' and sustained soundscape generated. Stasis however is an illusion - there is still effort being exerted to keep the balance. We have chosen to observe the underlying effort needed to maintain stasis through the users heart rate and muscle tension. As the users continue to sustain their balance the soundscape changes and evolves based on heartbeat and muscle tension. The goal of this performance is to make users contemplate their relationship to others and what exactly it takes to be in a balanced relationship with the other. If one user decides to end their side of the interaction and end their effort the soundscape collapses and shudders to a stop. While the users can feel themselves being physically affected by the effort it takes to hold the balance the intensity of the interaction may be less apparent to the audience. Thus, the soundscape offers a window into the effort expended to maintain the interaction for the audience members.

(3)Think about the notion of empowerment. Is your artifact really helping or challenging users or is it just another psychological prosthesis?

This performance challenges users to confront how they view themselves in relation to others. How is their personal contribution affecting another person? How can we examine the underlying effort it takes to remain in a state of balance when interacting with another person? What will this tell us about ourselves and about systems of interaction within a relational context?

We have decided to transform the physical effects (heartbeat, muscle tension, bodily-movement) of the conditions of this performance into a soundscape because we believe it can provide a direct feedback to the users and the audience members of the feeling of maintaining this equilibrium. We imagine this soundscape to be experimental and abstract in sound but ultimately will depend on the data it is fed during the performance. We expect to try many iterations of sound design to create an engaging and appropriate soundscape to match the physical exertion of the performers.

(4)Think about how to successfully communicate your intentions - what Interaction Design Strategies will you employ? What are you trying to tell us?

The different interaction design strategies we are going to employ in this project are Embodied Interaction and Human-Centered Computing, Data Sonification, and Sound Computing.

Design interaction in our performance will be kinaesthetic-centered through muscle contraction and expansion as well as bodily-movement (pitch/yaw and acceleration). Our bodies in motion by themselves and in relation to the other are the foundation of this project. By working within what is called an “embodied interaction” (Dourish 2004) framework we aim to explore physical interaction between two people resulting in sonic and light interactions that can convey messages of togetherness and being-with.

In order to augment the audience’s experience, we are incorporating the sonification of our muscle signal data coming from the sensors. This draws concepts from Sonic Interaction Design (SID) and new interfaces for Musical Expression (NIME) to inform our embodied approach to interactive system design.

This will happen by mapping and assigning the sensor data to the main sound attributes and parameters (frequency, amplitude, tempo, and timbre) We will explore techniques of one to one mapping and many to many mapping using either machine learning (Wekinator) or various libraries within Max/Msp.

We want the audience to perceive the performance as an extension of ourselves and our sense of being through sound, light, and movement.

SENSORS

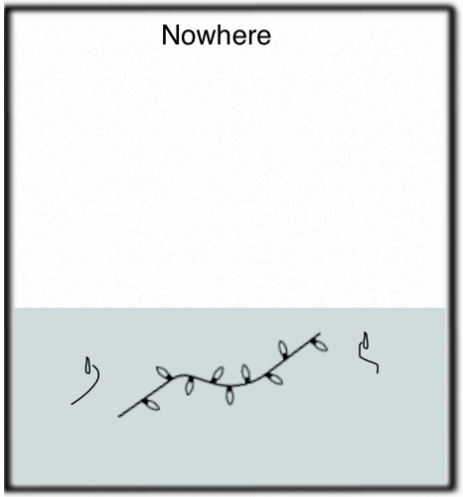
(2) Pulse sensors https://pulsesensor.com/
(2) Muscle sensor https://www.sparkfun.com/products/13723
(2) Accelerometer/Gyroscope - model tbd

For our performance we have chosen sensors that can measure data to do with the body - specifically ones that can measure states of exertion versus rest. Both muscle sensors and heart rate sensores can measure the physical exertion or rest of the user. More active bodily movement will create more active sensor reading. We want to look at the exertion over time of the body in tandem with another person supporting each other's body weight. We don't necessarily want to influence the body to be more active than it necessarily would be - we want an honest reading and for the soundscape generated to reflect that. The resulting sound will rely on us tuning the incoming data and giving space/meaning to a variety of results.

We also want to explore ideas of being influeced by the affordances of the sensors and if we will have to work against or tune these to our own wants/needs. We are curious to see how the muscle sensors make us want to move our arms as well as how having the knowledge that our bodies can alter sound/light will make us want to move them. We expect there to be an iterative process in figuring out the best way to tune and collaborate with the technologies.

Furthermore we wish to examine each performers bodily movement and how these are different/similar to each other hence the choice of accelerometer/gyroscope sensors which will also influece the soundscape.

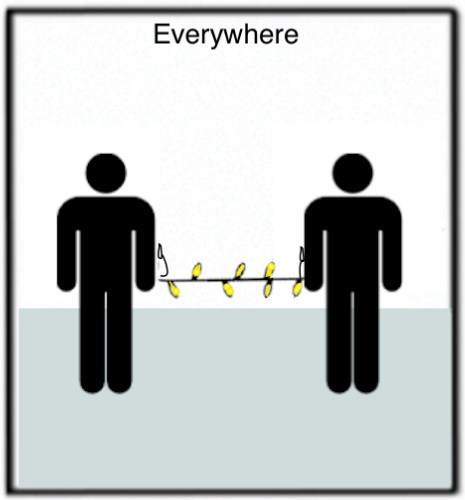
STORYBOARD



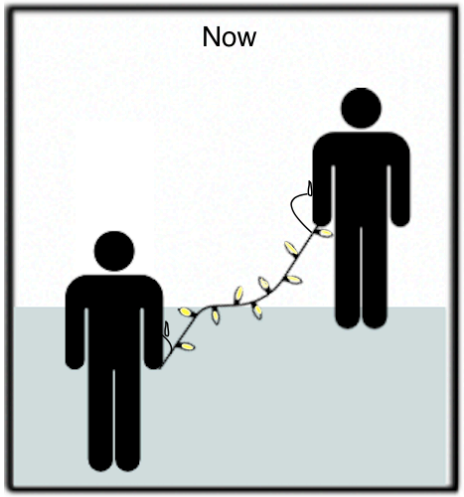
- Silence
- Darkness

Sarah Entering
- Silence
- Darkness

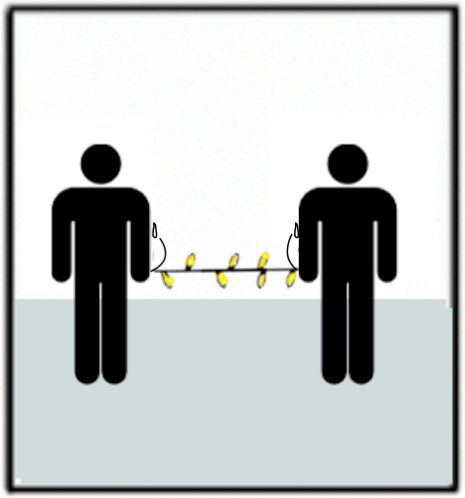
Maxime Enters
- Low rumbling sound
- Flickering lights, a slack rope



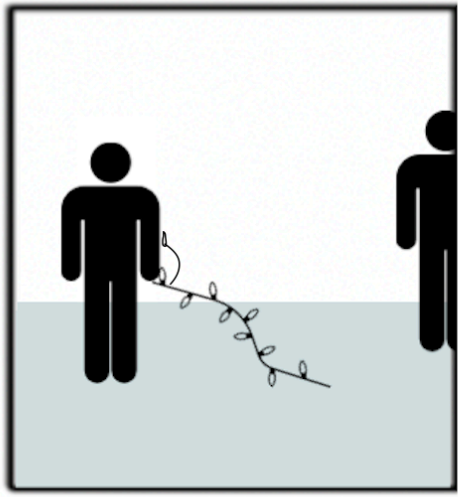
Muscles flexed, rope in tension
- Pulsating lights
- Sound of heartbeat pulses



Circular and rapid movement
- Sound intensifying with muscle data
- Lights bright and flickering
- Now



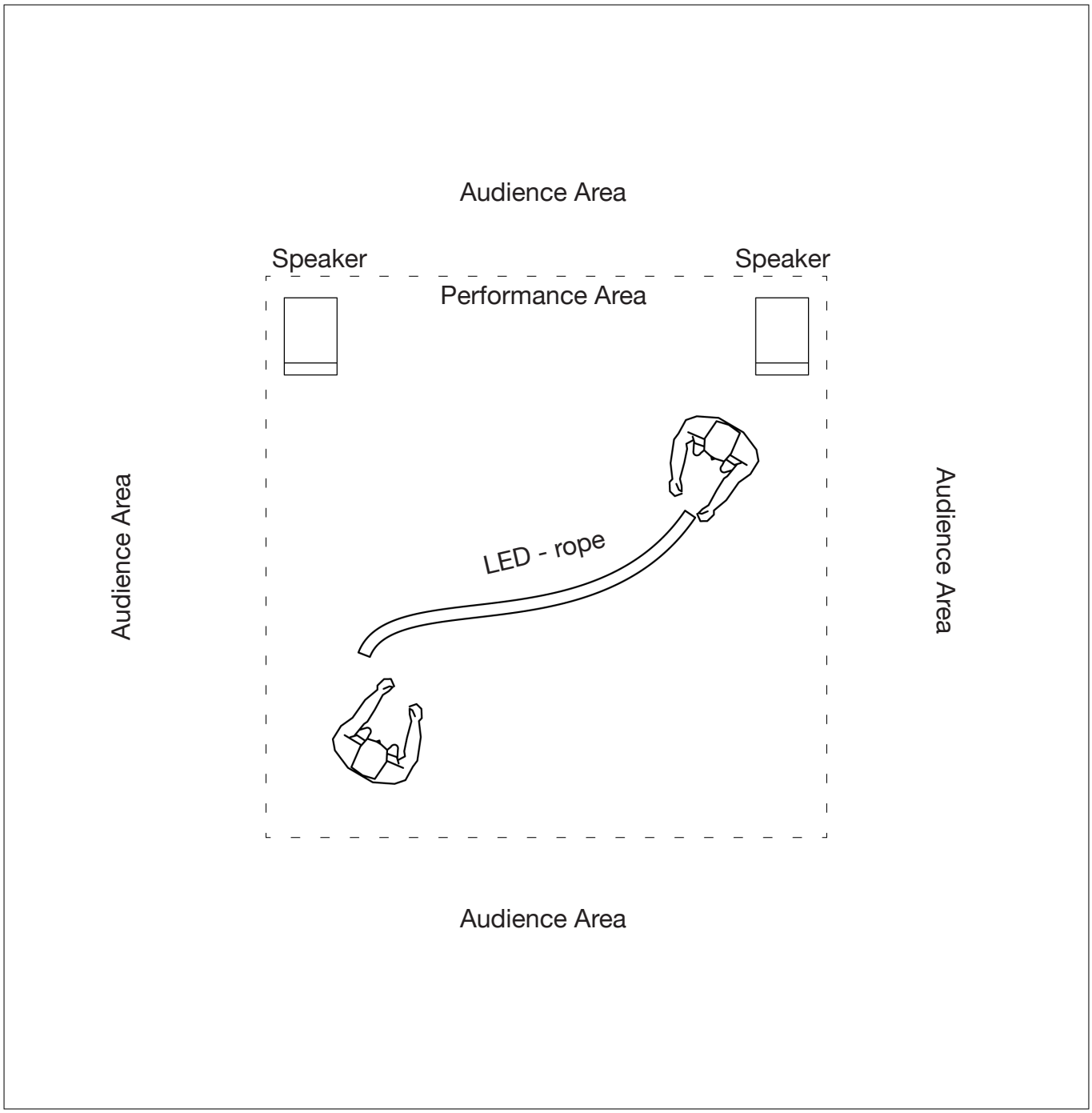
Original position retained
- Sound changing with muscle data
- Lights flickering with movement
- Now



Maxime drops the light abruptly
- Sudden Darkness
- Sharp noises followed by Silence
- Now

- Silence
- Darkness

PLAN VIEW OF PERFORMANCE



Each performer wears 1 muscle sensor, 1 pulse sensor and one accelerometer/gyroscope sensor communicating with arduino & Max/Msp. The sensors must be strapped onto the bodies of the performers in such a way that there is little wiring getting in the way of physical activity.

SIMILAR WORKS

Atau Tanaka - Le Loup, Lifting, and Myogram (2017)
https://www.youtube.com/watch?v=p8CKjmE7zys

Atau Tanaka's piece Le Loup, Lifting, and Myogram is a performance using EMG muscle sensors and machine learning to create a soundscape in real time. Tanaka uses his own body as a musical instrument, 'allowing him to articulate sound through concentrated gesture' (Modern Body Festival, 2016). In this piece we see Tanaka as a singular figure on stage wearing two myo armbands standing next to a laptop. As Tanaka moves, shifts and flexes his arms, sound emerges and changes as if he is sculpting it in 3D space. As Tanaka has no physical object or instrument to interact with he must himself define the gestures that determine sound. This brings up the idea of effort as he explains in his text Intention, Effort, and Restraint: the EMG in Musical Performance, 'In musical instrument performance, effort is directed through the instrument itself as a physical boundary object. We blow harder into the flute. The free space gesture captured by the EMG, however, can happen in the absence of any boundary object.' (Tanaka, 2015). We can clearly see this in his performance - there is no other place where his physicality is directed other than contained within himself. This containment and gesture of the self is then translated into sonic expression. Le Loup, Lifting, and Myogram show a large range of gestures and sound which in turn showcase the unique ways data from the body can be translated into sound.

Rikard Vilhelm Lindell - Critical Digitalism (2016)
https://vimeo.com/198963754

Rikard Vilhelm Lindell is a researcher, designer, code artisan and electro acoustic music composer that focuses on new materialities for musical expressions, and an associate professor in computer science at the School of Innovation, Design, and Engineering in Sweden focusing on interaction design.

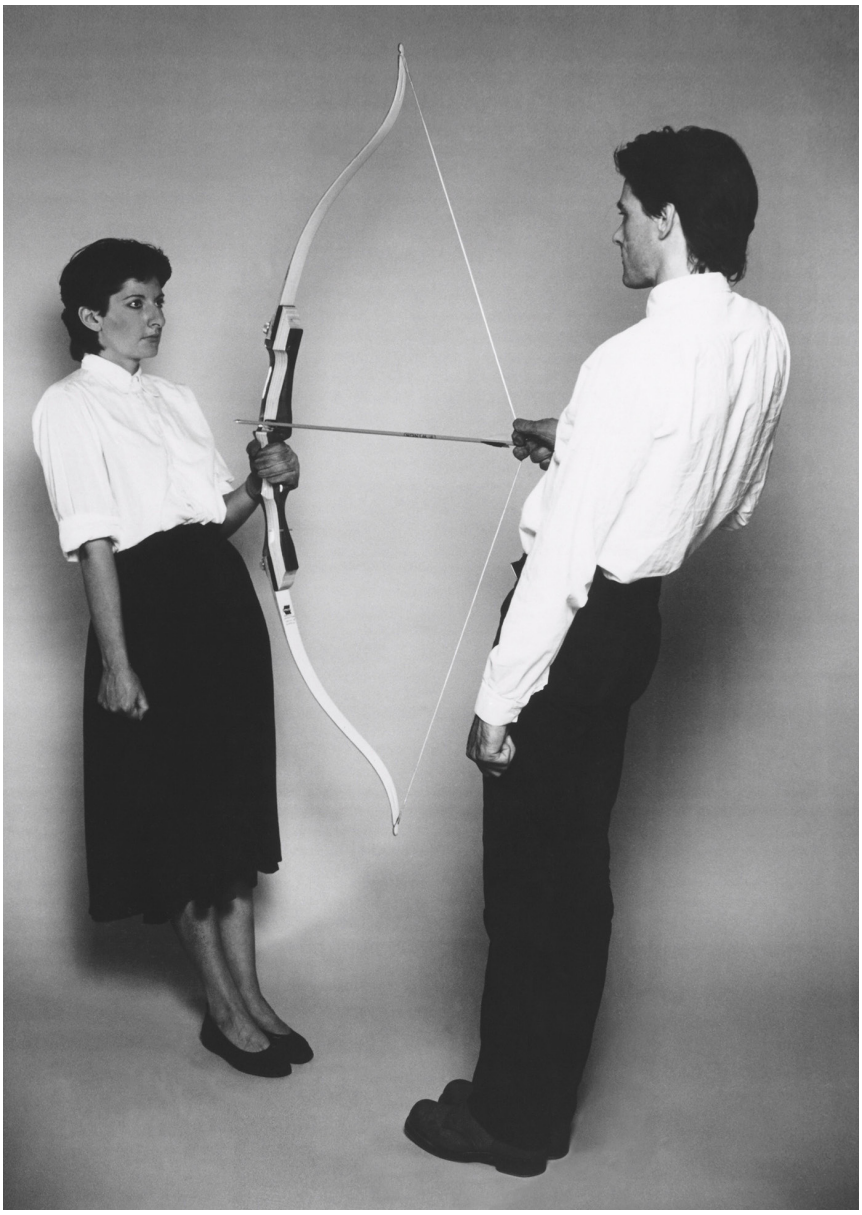
Critical Digitalism is a live analog performance by Rikard that utilizes the Myoware Muscle Sensor, an Arduino microcontroller, the analogue synthesizer Moog Mother 32, a computer, and his flute as an acoustic instrument.

His performance uses live sampling to augment his musical performance based on input data from the Myoware Muscle Sensor. The electromyography (EMG) signals that are coming from the Myoware Muscle Sensor measures the muscle signal amplitude, and this, in turn, affects his analog performance. He also projects the data coming from the sensor visually that are represented by scattered bits as part of his performance, further extending the performance with muscular input and embodied interaction.

The focus was on connecting his bodily functions to sound parameters, and utilizing his muscular system to become the instrument by moving, flexing, and breathing. This environment created an intimate relationship between technology and the musician, digitalizing us and humanizing the digital world.

Rikard argues the need to be critical of the dehumanization of industry and services, bringing in an interesting perspective of human infused technology.

Marina Abromovic + Ulay - Rest Energy (1980)
https://www.moma.org/audio/playlist/243/3120



Marina Abromovic and Ulay's Rest Energy is a performance piece that is composed of two people, a bow and arrow and 2 microphones. Abromovic holds the grip of the bow while Ulay pulls back the arrow on it's string. The arrow points at Abromovic's heart as the two pull away from each other in a static pose. All the while microphones on each of Ulay's and Abromovic's heart amplify the stable and gradually intensifying beating of their hearts. The performance lasts only 4 minutes before they must stop from the stress, exertion and danger. Abromovic states, "it was really a performance about complete and total trust", which is clear given complete trust she must have in Ulay to be able to not release the arrow. This performance plays with the idea of a power dynamic and how you can fully submit to another person. Ulay clearly has more of the power in this situation, it will be his fault if Abromovic is shot with the arrow. What is so striking about this work is how simple yet effective it is in conveying it's meaning.
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COMPARISON + IMPACT

Tanaka -
Our project differs from Tanaka in focus and execution. Tanaka uses only his body as an instrument while our instrument emerges from a system of 2 bodies held in tension through a rope. As our project is interested in the notions of trust, collaboration and effort between people it makes sense that we examine how 2 performers' physiologies react in a performance together. Also, while Tanaka chooses not to include lighting in his piece we have decided to incorporate an element of lighting to further intensify the feeling of underlying effort experienced by the performers for the audience.

Abromovic + Ulay-
Our project is similar to Abromovic's in theme and form. Abromovic and Ulay's performance is about trust between two people and is shown in a very simple and physical way. The amplification of both performers heart rates is an added layer to the performance and highlights the inner effort needed to maintain the safety of Abromovic. While our performance doesn't have life or death stakes we take inspiration from the theme of trust between people as well as the importance of illuminating the bodily processes that accompany this feeling.

Rikard Vilhelm Lindell -
"Critical Digitalism" can be considered as a musical performance performed by Rikard only, whereas being-with, seeing-with, hearing-with is performed by both Sarah and Maxime as their muscles form the piece collaboratively. Rikard did not utilize light in his performance, he represented the data in another form. His muscle data was projected visually on a screen behind him. Rikard also introduced sounds from his flute. Our project is not composed of acoustic elements/instruments.

The 3 projects we examined use the physicality of the body as a way to convey meaning. Tanaka and Lindell are interested in using the human body as an instrument either by itself (Tanaka) or with a traditional instrument (Lindell). Abromovic and Ulay on the other hand use the body as a way of experiencing and showing trust between two people. Our project combines elements from all 3 projects to in order to showcase the communication between the self and the other.

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