DIGF 6L01 - Creative Computation
Project 2: Daisy

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ABSTRACT.

The aim of this project was to create a physical object that would positively or negatively affect its environment. Our intent was to build something small, adaptive and mobile, easily installed in a space which would engage with passers by through sound.

HOW IT WORKS.

Using three proximity sensors, the object responds to the general business of the room by mixing various types of sounds.

BACKGROUND.

IDEATION

In our initial discussions, the topic turned rather quickly to active participation of an object in space; what would invite audience participation? Would there be a reward for participating? What would the indices be and how should the object codify the information it receives? What kind of environment should the object occupy? We were able to identify a series of parameters that we wanted our object to fulfill:

- the idea of losing one's self in an environment
- interference or disruption, either externally from the users or from the object itself
- exploring pieces of the whole; using multiple inputs
- coordinated assembly of parts or participation from the user to elicit a response from the object
- components that would need to be assembled or adjusted in some way
- controlling the data flow from the object
- making the object respond using data received from users

Figure 1: Samples of inspiration forms for object. See Mood Board (attached)

Our focus shifted to social interactions that happen within small spaces - our examples were a hallway, bathroom or elevator. It was initially determined that the object should force a dialogue between the participants, with the ultimate aim of either critique the social interaction that happen inside a given space. Furthering that idea, we drew guidelines of our design:

a) Human presence either disrupts or connects the objects' functions.

b) the operating system needs multiple people in order to become whole.

c) the greater whole affects or critiques how we communicate and interact with each other.

We discussed the idea of a 'reward' for closing the system through interaction in some detail. Initially, we thought to create a secret message hidden behind distorted video, sound or both. The message, we determined, would have to be linked to the form and design of the object, but we agreed to develop the idea to project a heavily distorted video and audio signal which would clear as the users surrounded the object and placed themselves in specific relations to the object.

The 'reward' was to be a sort of decoded circular narrative, in the spirit of James Joyce's Finnegan's Wake, but repurposed to something more relevant to human computer interaction. Some research was done to explore creating our own narrative, but we turned away from a dictum as it became apparent that making users work to try and solve a sort of physical riddle, only to be awarded a lecture, was slightly anticlimactic.

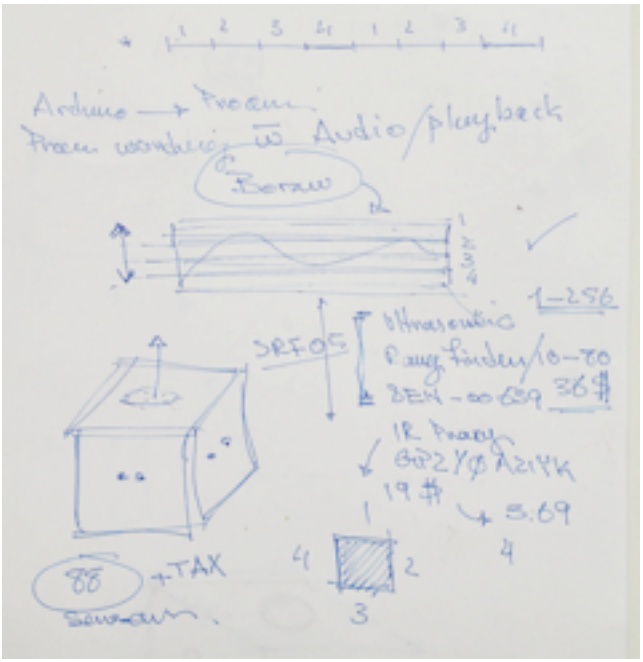

Figure 2: Waveform breakdown and initial cube design

DEVELOPMENT.

FURTHER EXPLORATIONS OF FORM

As the form and physical design of the object developed, it became clear that our thinking about some interactive details had to be re-adjusted. Our interest was in creating something that could inhabit any space - not be necessarily restricted by installation - which led to some radical adjustments to the object and the focus of the project. To that effect, we minimized and streamlined our object to a cube form, after also examining spheres and pyramids.

Along with the form redesign, we re-examined the functions of the object. One of the major interactive components to be eliminated was the video, since the issue of orientation -not only up-down but left-right- forced the object to establish a sense of directionality, whereas we wanted to let it be a more inclusive experience. Bearing that in mind, along with our decision to reduce the reward component, we focused on creating interactive soundscapes.

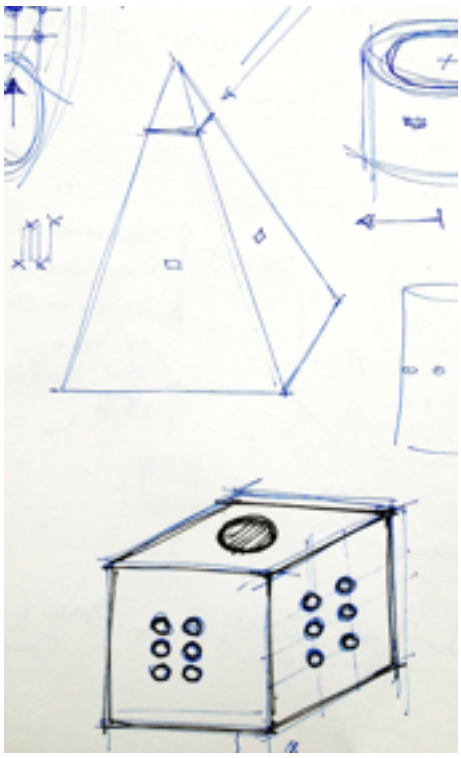

Figure 3: Pyramid and cube designs

The idea was that the logic of the object would be affected by the number of people of the room. Originally, we had though about implementing Andrew's laser pointer into the system to act as an attendance counter - it would accumulate the number of people passing through the room which would influence the object's output either through pitch, tempo or frequency. This was eventually removed from the plan as it would force additional installation components, which went against our plan to make this as autonomous and adaptable as possible.

Based on the discussions from class, we looked again into the positioning of the object in the space; specifically, whether it should be mounted on a platform, tabletop, resting on the floor or hanging. From our point of view, proximity sensors would be best suited in a place where they would have as little interference as possible - hence the decision to suspend the object.

We also began exploring the idea of hidden engagement with the object, or rather hiding the sensors so as to encourage exploration of the object. Jackson suggested that the object perform and that performance encourages exploration of the object. After some discussion about the nature of the objects' sensors, we reduced the sensor count from four inputs to three; whereas we had planned to force interaction between participants, we now began to develop a more direct interaction between the object and the participant. It was at this point that we began to re-examine our shape design and materials.

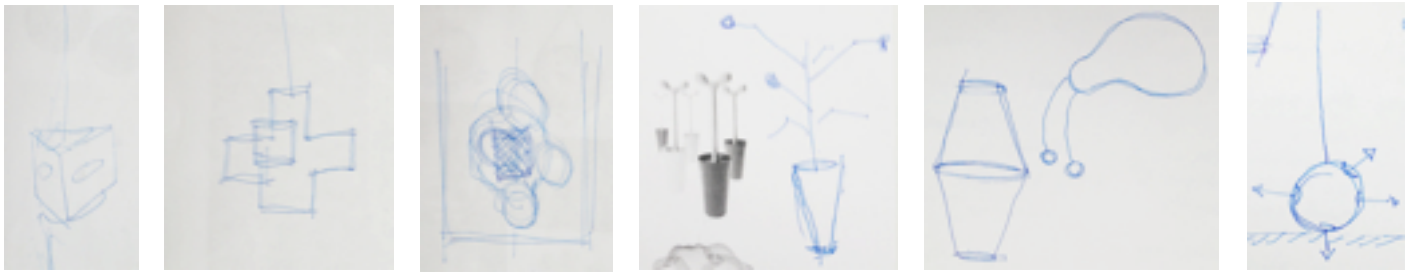

Figure 4: Various compound shapes sketched during exploration process

MANUFACTURING

The decision to move from a geometric shape to something more organic came out of the soundscapes we had started to explore. Our logic was that if we were creating an emotionally responsive object, it should look like something more than just a shape in a space. It should look like it emotes.

Figure 5: Materials and shapes explored for housing

Whereas we began with the idea of making something constructed and machined, our focus now turned to making something much more organic in appearance and attitude. We resumed our research to include organic materials, such as wood, feathers and fur. The objective was still to keep the design sleek and interesting,

Figure 6: the Pumpkin

The styrofoam pumpkin was a surprise find that began as a joke about form. It was found in a bargain store but it became the clear choice when Jackson determined it would be relatively straightforward to adjust the shape and repaint it to suit our needs. The oblong shape and obvious organic quality gave us the texture and form we were looking for without having to resort to CNC machining or designing and printing 3D parts.

From there, it was simply a question of assembly. Jackson developed the Max sketch and remodeled the pumpkin with Fimo and spray paint while Borzu handled the electronic construction and soldering. The process was relatively straightforward with not major issues or problems; our object came together pretty much as we anticipated.

CURRENT FORM

Although Daisy, as it has now been named, doesn't physically resemble the original designs we had anticipated, we feel that the core of our idea has successfully transmitted through the development. Among the feedback we received while running tests and final preparations, we found that the object acted less as an engagement with passers-by and more that participants performed for it. It acted as a sort of calling, where people would gather around to try and discern its intentions much more directly than we had anticipated.

A series of soundscapes and soundtracks were designed and implemented into the project. They included:

- a recording of Bicycle Built for Two, the first computer-generated song produced by IBM

- a short retelling of the legend of Prometheus

- a combination of static and atonal noises, whose frequency was affected by the sensors

- noises from rainy streets

- parts of a house dance track

When we combined recordings of the Prometheus legend, with Bicycle Built for Two playing underneath it, the object seemed to take on a more storytelling attitude, whereas when the atonal noises were activated the object took on a much more anxious tone. It was fascinating to watch how users' interactions changed as the sound mixes were adjusted; it seems as though the user became the performer.

The final physical shape has become something akin to a mock-up of a sort of organ, for instance a heart, as indicated by the red paint and 'arteries' that house the sensors. While it is most definitely not a human heart, one wonders whether some sort of independent movement would make it seem alive?

MOVING FORWARD.

Now that Daisy's development had developed to this point, our attention turned to how we could proceed. One suggestion was to produce more of them and create an installation of these hanging objects that would interact more intimately with each other and an audience. Alongside this, we endeavor to explore how the speakers producing the sounds could relate to the objects' positions in the space; specifically, using 3D sound effects to localize the produced audio. Another suggestion was to place the speakers directly underneath the object. We also discussed the possibility of implanting microphones into the objects and use the audio received from them as the basis for new soundscapes.

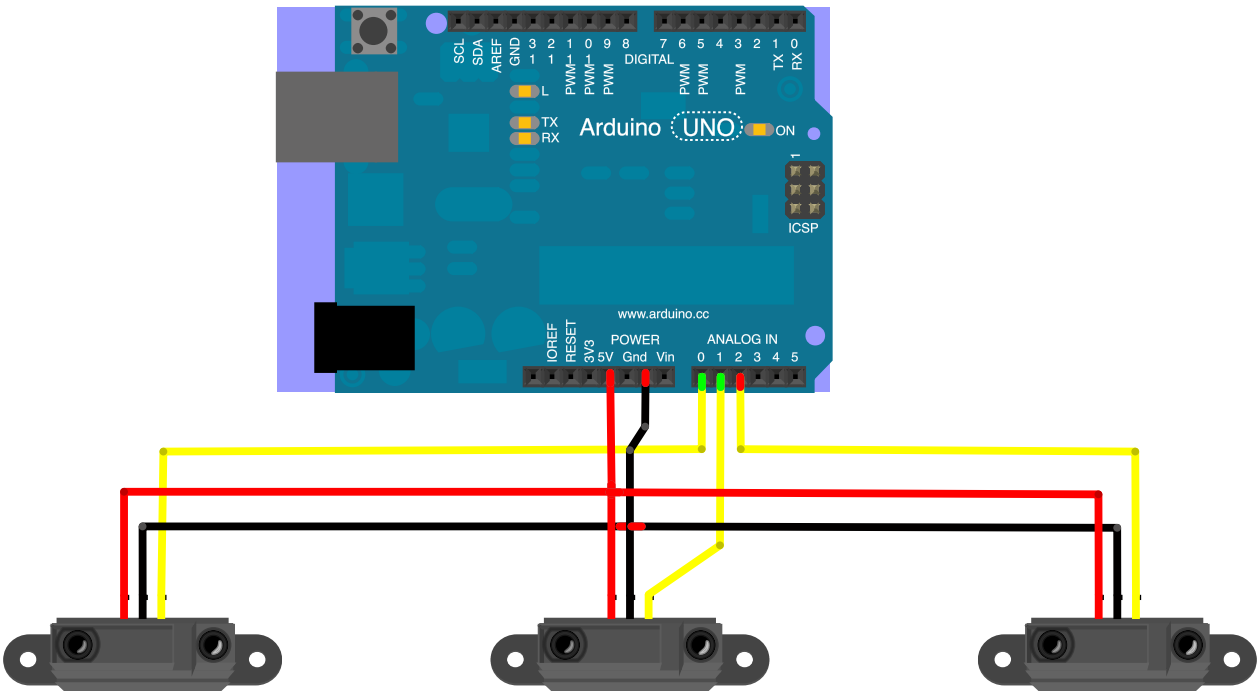

Figure 7: Wiring diagram