Project 00

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Written Description

1. <u>What is it?</u>

    I went with a large-scaled representation of the needle toy that makes an imprint of a hand or whatever object is put into it. This machine or toy can react to any amplitude type data, and thus it can react to sound and pressure spikes.

    The machine uses two user aspects: conversation and movement. The conversation piece uses Google Home and Google Duplex (an advanced, conversational AI) to have users have a conversation with this amazing new AI system. As the user speaks, the top bridge's bed of "needles" moves in waves by the amplitudes of the user's responses. The pressure motion piece is attached to the street below. As the public walks or drives over the sensors, the initial contacts (so each step or car) are recorded, and based on the pressure the "needles" move into the bottom bridge installation.

    The installation will be located on both floors of the bridge. It will be in plexiglass, so it is visible to the people walking over it and the public. The Google Home and Duplex setup will be on one side of the top part of the bridge, and the pressure sensors for the public interaction will be installed under the length of the bridge.

    The idea of the project was to use a mechanical system of some sort to represent human motion and senses in some manner. I initially wanted to have motion from amplitude waves from a yelling or some child-like voice interaction. My idea was generated from those speakers that have lights and liquid fountains that react to the music being played. I then wanted some type of touch feature as well that interacted in a similar amplitude-like function as the voice. This brought me to the needle toy that makes the imprint of one's hand or body part when you place it in it.

2. <u>How does it fulfill the requirements?</u>

First of all, I think the idea of motion and interacting with motion is joyous to anyone no matter the age. My system allows for both the employees at Google and the public to have this joy if they care to interact or pay attention to it.

Employees can play around with the AI, and see the astounding new conversation skills programmed by their own company. Thus, they can take a break from their work, and interact with motion while testing the capabilities of the company's new Google Duplex.

However, if employees or the public don't want to interact with the system, the experience can be nonintrusive. The public can walk around or ignore the installation all together, and the Google employees can simply just walk over the installation or decide to not talk to the Google Home and Duplex product at all. Thus, the project passively interacts with its environment as the data taken always interacts with the mechanical system, but can be ignored. Therefore, it won't be intrusive to those in a hurry.

I also wanted to have some symbolism of gentrification and community impacts within the installation. I think this was accomplished by having the public interact with the "toy" as well, so it isn't just Google who can have fun with the installation. I think this starts to bridge the gap between the surrounding community and Google. Also, as the public interacts with the installation, the "needles" go into the bridge and towards Google. This symbolizes that the surrounding community impacts and is impacted by Google just as the "needles" intrude on Google's bridge.

3. What is the user experience?

   There are 4 main user experiences: employee voice interaction, public motion creation, employee motion observation, and public motion observation.

   Employees can either interact or view the system from inside the bridge. They can create their own motion by having a conversation with Google Duplex that is connected to a Google Home next to the one entrance on the top bridge. Their responses create the wave motions within the installation. Employees can see motion from either the top of bottom side of the bridge. The top motions are waves, and the bottom motions are spikes from the public.

   Public interaction or observation is solely based on the exterior of the bridge since they don't have access to the inside of the building. That's why I liked the idea of the plexiglass surrounding the mechanical system as it is transparent to the public and employees, but seamlessly becomes a floor that doesn't seem "out of place". Thus, public viewers can see the motion from up close or from a distance away. It is also unique since the public can interact due to the pressure sensors outside the bridge. And since the public can interact with the installation, hopefully that makes them enjoy the art as well.

Bill of Materials

1. Google Home with Google Duplex on It

    There will be one Google Home on the top level of the installation for voice sensing and AI communication with the user. Google Home is listed at about $70.00 to $85.00, however since it is Google property, it shouldn't be a major cost to the company. This applies to the Google Duplex AI communication as well.

2. Pressure Sensors

    Most pressure sensors are around $12.00 each. I assumed that there would be approximately 150 sensors so the price is approximately $1,800.

3. Plexiglass

    I found the retail price of Plexiglass to be about $389.09 per cubic foot. I assumed the total cubic space we need is about 81.67 cubic feet. Thus, the Plexiglass cost becomes approximately $31,775.70.

4. "Needles" or Metal Rods

    I assumed the needles to be stainless steel rods 303 that are a 0.5" in diameter. I approximated we needed 82505 rods. Thus, if the price per one 3 ft rod is $4.68, the total price is about $38,613.40.

5. Pistons for Mechanical System

    I found the price per a pneumatic piston is about $170.00. If we use one piston per rod, the price for the system is about $14,025,850 which becomes the most expensive physical part of the system.

6. Labor

    Labor is a tricky cost. Typical laborers get paid around $18 per hour while more skilled workers can get paid up to $45 per hour. Let's say the installation takes a month. That's 4 weeks of about 10 unskilled laborers, 5 skilled laborers, and a manger installing the project. Using the worst case possible, this can cost can become $72,000 without overtime considered for only a month.

7. Materials for Structural Support and Replacement

    If you have to replace parts or even sections of the bridge for the project, the material for supports, steel, concrete, and other finishing materials can add a significant cost to the project. With everything, I would say costs can add up to approximately $500,000 to $1,000,000 of just material.

418-734 Project 00 | Aug. 29, 2019 | Russell Orlick

3D Image of the System
* not drawn to scale
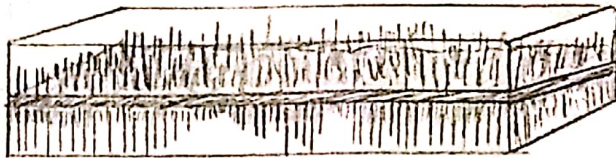
Section of System
* not drawn to scale

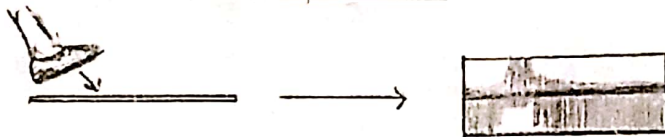## Elevation of system
* not drawn to scale

Reaction of System by Voice

- Google Duplex & Home talks to user & responds
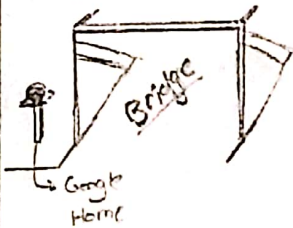- user responses generates waves

Reaction of System by Pressure

- steps, initial contacts, cars over sensors, etc. spikes the pressure sensors & thus the rods or "needles"
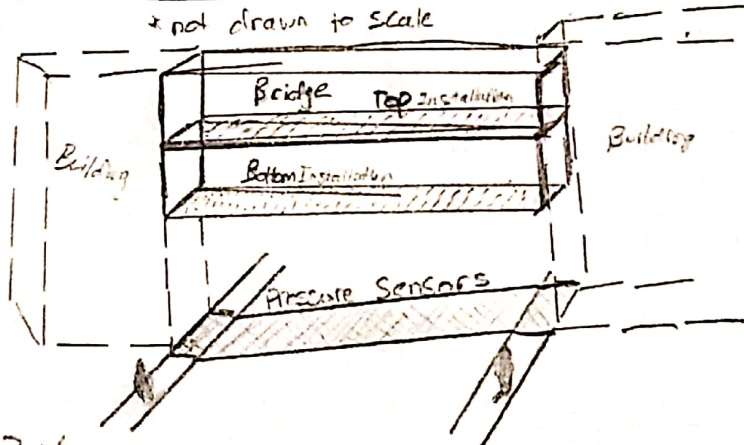
Placement of Google Home
* not drawn to scale

Bridge

Google Home

Placement of Pressure Sensors
* not drawn to scale

Building

Bridge   Top Installation

Bottom Installation

Building

Pressure Sensors

Placement of System on Bridge
* not drawn to scale

← voice System

← pressure System