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CART 360
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PROTOTYPE SPACE AND COLOR



https://github.com/spacemanjan/CART360/tree/master/Assignments/Assignment_physical_prototype



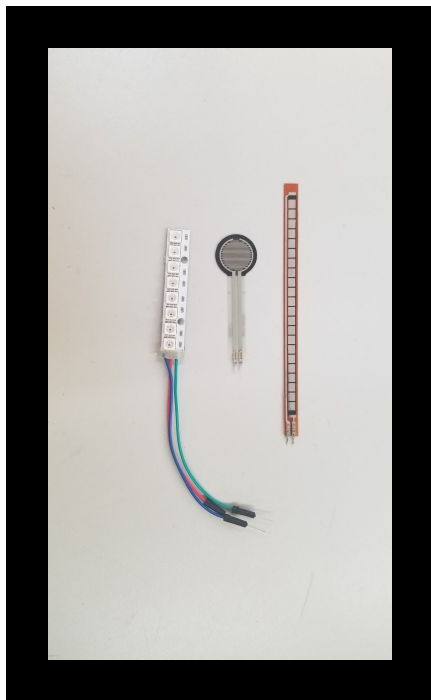
1. NON_TECHNICAL_WRITTEN RESPONSE

Why do we prototype? From a glance this question, to any student in the arts, doesn't look right, it is like asking why not just do it perfectly on the first try. Prototyping can be quickly defined as problem solving, in other words it's the process of learning, and in much greater words it's the way by which we navigate through much of life, however I'm getting into the metaphysics of the term. The process of prototyping began with the sketches I provided for the first proposal, I looked at the general flow of information and tried to imagine how it would be passed from the user to my undefined interpretation orb. I envisioned a seamless flow of information passing from one sensor, being decoded by the arduino and some sort of code I'd have to write and delivering interesting and insightful output. Prototyping lets us as creators, dive into a large problem from any angle, that first step is so insightful because blindly we jump into solving a problem we've never faced before and learn so much immediately. Katheryn McElroy in her Book "Prototyping for Physical and Digital products" said a prototype was a "preliminary model", it was "anything that takes an idea from your head and gives it a form" from there on out it's testing, improving, redesigning, and adapting to the realities of the challenge put before you.

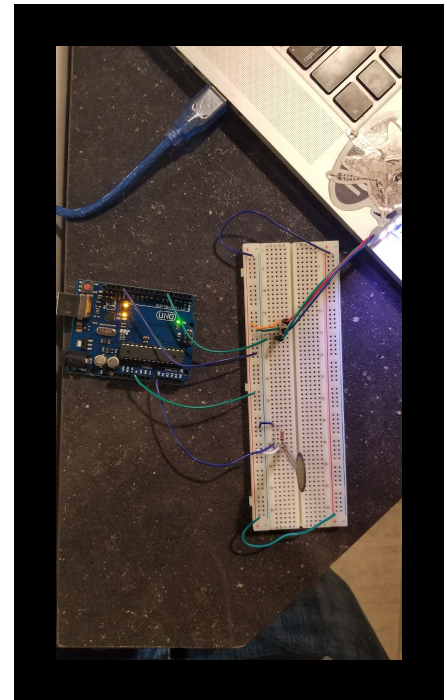
When it came past the point of sketches and I began working with sensors, the intrinsic goal of my object were not immediately clear to me, what kind of data was I going to be observing, what would the user interaction look like, and what would my end piece look like. I began the process of refinement by looking over my notes from my meeting with Elio and thinking about my intended user, how would they be approaching it? If it's for relaxation what kind of input could I expect from them? Then I broke my imaginary machine into piecemeal parts: I knew I would need LEDs, and at least two sensors of some kind. With an 8 LED ws2812 strip, a flex sensor, a fsrPressure sensor, and absolutely no idea how any of it worked, I began experimenting, and as quickly as that my idea was starting to take a more solid shape. Experimenting is one of Katheryn

McElroy's four reasons why we prototype "Each prototype you build will address a specific assumption or design element" by taking on each issue one at a time, I gained tremendous insight into what was possible, what would work and what wouldn't. For example, although initially I thought the flex sensor would be an interesting addition, in practice I found that it didn't fit the bill for the kind of sensation of interaction I wanted to foster.

So far in the process of prototyping I find myself at the low-fidelity level, it's made cheaply with materials I have around me, a couple that I went out to buy but it affords me testing easily and quickly, the freedom to change things rapidly and to explore new ideas. The pleasure to prototyping and why we prototype is because it's the only way to learn, trial and error, and learning from the errors.



My Three Initial Sensors



Early Prototype



2. TECHNICAL_SENSOR_EVALUATION

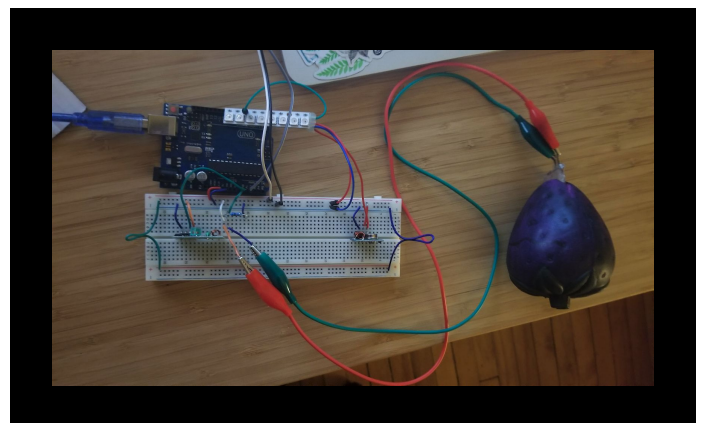
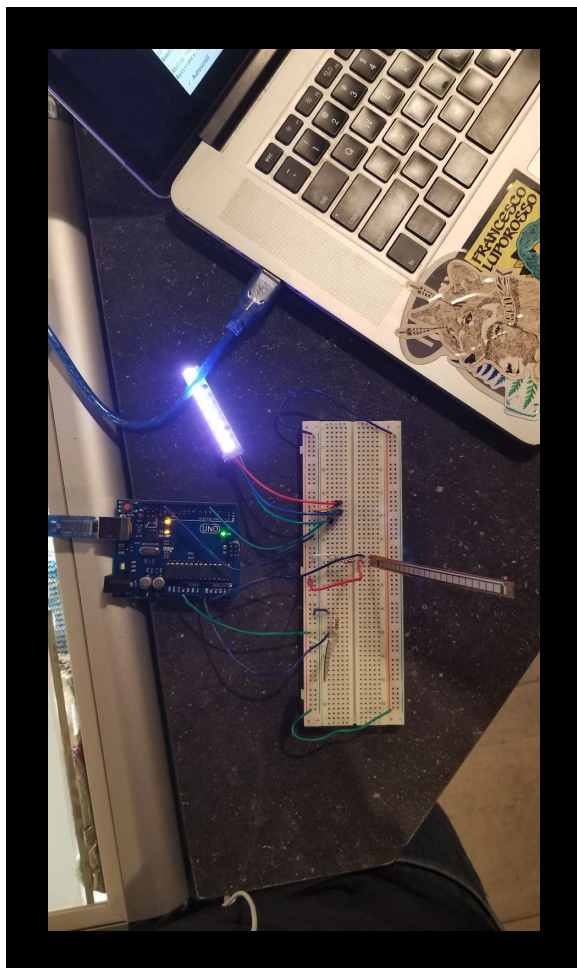
For my prototype I decided to use an FSR 402 pressure sensor as one of my primary sensors, it translates the physical responses from the user into a number value between 0-1000. The advantages of this sensor is firstly that it is very thin and easily slipped into the stress ball I use in my project, secondly it is also very simple to use with very little extra circuitry to implement. As my project looks at the physical condition of the user in order to calm them and give them a relaxing space to reflect the pressure sensor is ideal in order to judge the force with which the user squeezes the stress ball and thus the output of colors can be changed in order to help bring the user into a state of relaxation. The FSR 402 is at the moment my primary sensor, coupled with the soft and squishable stress ball it reads incoming data easily translatable into a variety of outputs, for example it allows me to organically observe data overtime and by setting a couple different threshold I can easily convert that into color changing effects for my LEDS.

The second sensor I used was a pulse sensor. The pulse sensor is quite practical for my project since it can operate using either 3v or 5v which for simplicity's sake is easy to test and work with but also if I wish to subtly integrate it into a piece of fabric their won't be a massive battery hanging out of it. In theory the pulse sensor is an integral sensor to my project for gauging the physical and mental state of the user, however the problem with the pulse sensor is that it doesn't work on everyone. While practical in its potential data yield from the user, I've figured that simply its integration and supposed functionality in my project will have a psychological effect on people using it whether or not it actually reads the pulse of the user or not. In short it advocates itself for an inclusion in my project.

Another Sensor which could afford me a more spatially aware object is the HC-SR501 PIR motion sensor. It's a very versatile sensor which detects motion, for my project this would be practical for recognizing when someone is entering or leaving the space that my object lives in.

Since one of my goals is to create not just an object but a space which is actively inducing people into a state of relaxation, having it without any physical input begin the induction process would be advantageous, as well as imbuing the machine with a reactivity to its environment, making it more “aware” of its surroundings, on top of that it is also practical if I wanted to layer onto the color changing and sound changing data collection. For example it could allow me to know if someone is fidgeting and repositioning themselves or if they are completely still, valuable information for my electronic meditation coach.

Finally, I'm also considering including a VMA 309 or another microphone of some kind, this could afford me through its sound levels another layer of “awareness” of the surroundings letting me know whether the machines white noise is enough to cover the external sounds. It could also be used to alert the machine when someone is near it, once again giving it a kind of sentience and autonomy that helps streamline the user experience.



Another Early Iteration with Flex Sensor <--> FSR-sensor, 433Mhz link Kit, Pulse Sensor (not visible)



3.CONCEPT_EVOLUTION

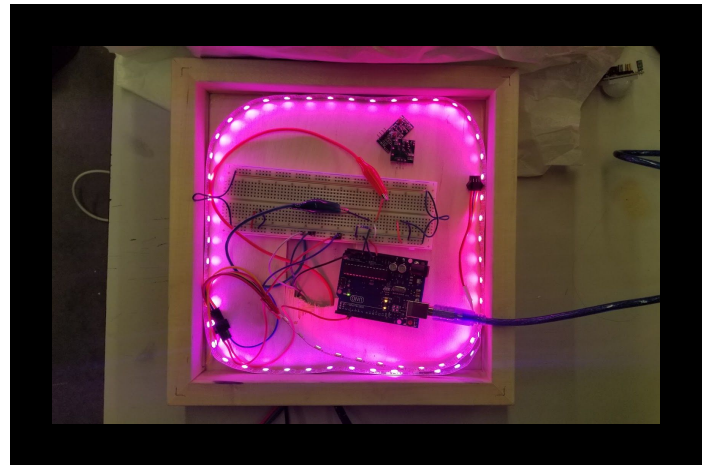
Frankly my initial intention was a little overzealous, in my proposal I had in mind to penetrate deep inside the human psyche to create an emotional polygraph machine which would let people know what they were really feeling inside. Over the course of researching for my project (researching on the technical side & researching my own abilities) and after consulting with Elio, I saw a clearer yet still misted vision of what I could make. After having prototyped and played with sensors/materials, I came to realize that as it stands right now it's a non-obvious LED controller. In order to link the user to the object I've decided that it requires Physical input some way of reading the physical condition of the user, I see that developing a more nuanced and complex relationship between various Sensor Data and the color/sound output is the first step, going forward, to delivering the experience of an "aware" and guiding meditative space. An interesting difference between my initial intention and my current intention is that with the former I had paid little attention to the materiality of the project, now with the latter I see it as the lynchpin of my project. Materials are the intermediary between the user and object, keeping in mind that every choice in materials is an opportunity to draw in the user and create a link between them and the smart space. From its original conception to its current iteration, I can say that I have gone from the far-fetched, to struggling with LEDS, and finally settling on an Idea which I know is doable.

4. LOW_FIDELITY_PROTOTYPE

In the end the final outcome is what I might say is a miniature of my final product, and missing more Sensorial data.



Low_Fidelity_Prototype



Low_Fidelity_Prototype