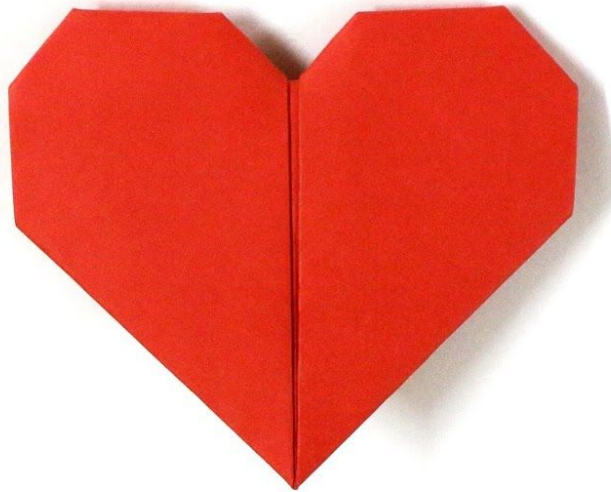


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CART 360  
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Project Repository

<https://github.com/spacemanjan/CART360/tree/master/PAPER%20HEART>



PAPER HEART

“The heart speaks in whispers” this isn’t just the title of Corinne Bailey Rae’s 2016 album, it is also an honest statement, which implies just how difficult it can be to hear what’s being told to us deep inside. While we’ll never truly be able to fully understand our heart, as another famous saying goes “the heart wants what it wants” and we are powerless to its whims, maybe we can interpret it, translate its secret signals and give ourselves some insight. What if when we are truly confused we could simply hook ourselves up and find out how we feel deep inside, perhaps this machine is something personal, something you would keep in your room useful for moments of introspection. Yet I also see it like a fun game of sorts, like one of those old love test machines you could find in an old arcade. My object is made to hook any person up to the hidden language of our heart, to find the emotions we may be feeling deep inside even without truly knowing it. It is in this realm that my project is situated to intervene, in the subsurface realm of emotions, the troubling chaotic ocean of feelings. In many ways it's also made for meditation, for an inward look at yourself, an x-ray into your heart and deepest desires. It belongs in all our lives in many ways, haven't we always harboured a desire to know what we truly feel, or what our body is actually telling us, I know for one that I have.

As I have explained my proposed project is made to provide insight into our own emotional state through simple interpretations of our bodies natural data outputs, mainly our heart rate. The nature of the object means that I want the user to see it as an extension of their own heart, a visual representation. Through the repetitive flickering of the light when they are first hooked up, all the way to the steadying of the hue indicating their emotional condition I wish it to create a physical link between the user and the artifact. This connection isn’t simply just a physical manifestation of the heart, it's also the physical manifestation of our emotions a totem to the complex chemical reactions happening in our brain that affect our heart and body. More than anything this artifact relies on the interpretation of the output to be meaningful to the user, encouraging revisits, maybe

even motivating the user to feeling misunderstood by the object challenging their understanding in comparison to the machine's interpretation. On a less personal level, this artifact raises the question of how machine's interpret us, how does our data look through the eyes of cold, unfeeling, logical machines. With so much personal data flowing through the web and society being increasingly designed by machine learning to anticipate our next move, this artifact serves as a way of seeing this macro relationship on a micro and deeply personal scale. Perhaps it will serve to awaken us to the multiple levels of machine interpretations going on around us on a daily basis.

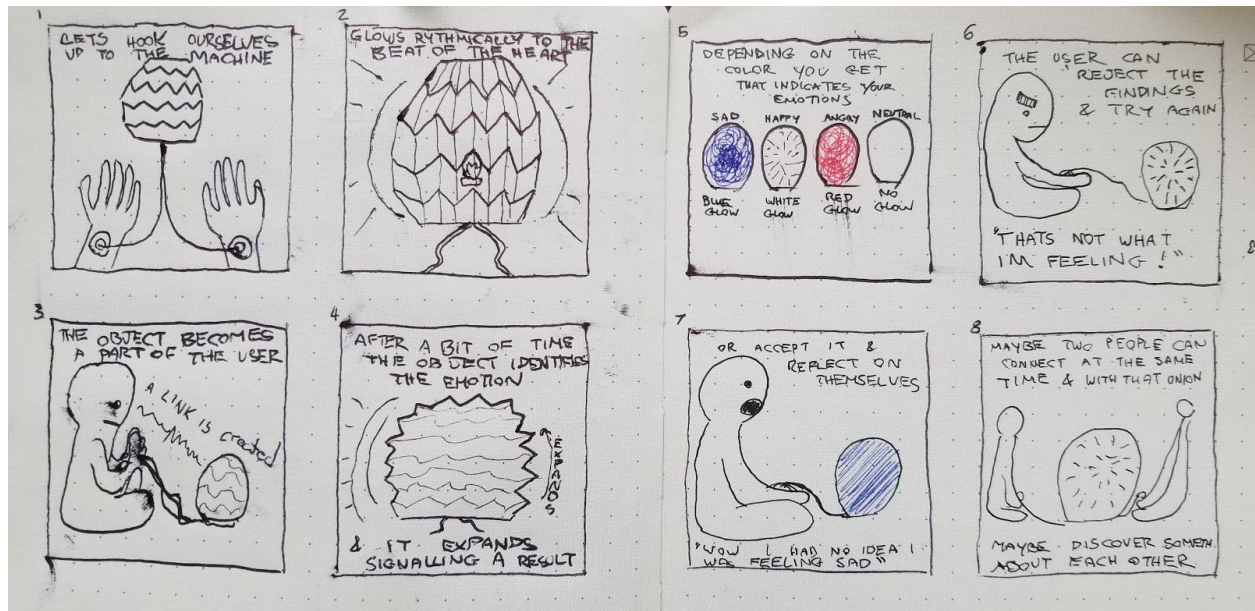
I like to think that I'm in tune with my emotions and that I have no difficulty expressing them to others, that I'm an open book. In some ways I am, but often and I've found this is true for many others as well. Emotions are complicated, they've been historically speaking taboo for a long time, and while we may be living in a time where emotions are accepted, validated and respected its still understandable to feel as if it's hard to express them. Not only this but emotions are confusing (as I've mentioned above) complicated even hard to decipher, I don't see this as a meaningless object or a psychological prosthesis that manifest our feelings. This artifact should both challenge and help the user, it should make the user feel uncomfortable, penetrated on a deep metaphysical level, as well as serve to help the user understand the physical signs and secondary feelings that accompany these deeper primary emotions i.e stress, love, happiness, anger, maybe neutral. It is also a dynamic system which forces self-regulation upon its user, it forces self reflection in the face of data and challenges the user to either prove it wrong through re-testing or to accept its verdict and revisit it in different states encouraging a growing understanding of ourselves. I can see this as being a tool which empowers clear open communication of feelings, and opens the channel to the inner world.

I suppose that at the end of the day I'm trying to explore the realm of bringing the inner to the outer through sensors and machine interpretation. Isn't that just what technology was made

for, to expand human ability, to go beyond limitations and to forge environments under our design. I've titled this project paper heart, because I hope to make it out of folding paper to make a circular form. This paper craft object which would interpret the heart rate of the user and change its color and size depending on how the user feels, is also a sort of manifestation our own heart, the paper reflecting what a delicate object it is. I also am interested in seeing what happens when machines look at us, how does that make us feel, in a world where sensors, cameras, microphones are all poised to absorb our data, how do we feel when an object is looking deeper inside us. Paper hearts isn't a simple interaction because it is challenging and helpful and I suppose more than anything what I'm trying to say is that understanding emotions aren't simple, we can be categorized, identified, but even a machine will have difficulty understanding our inner world. We are the algorithm that is nearly impossible to decode, plug us in and watch the show, perhaps this is just the prelude, and one day even this fantastical accurate interpretations of our inner world will be possible and accurate. However, until then, we should gather by the paper heart and look with curiosity and anticipation to see how it interprets us.

For this project I want to use a pulse sensor as the primary sensor for generating the output of the artifact. The pulse sensor is a heartbeat monitoring sensor which takes in the minimal vibrations at sensitive or expressive points of your body where the heartbeat is felt. I could also use a respiration sensor to give added data to the artifact. All in all the purposes of the sensors in association to the artifact is to link the data streams of the body to the data output of the artifact, linking the body to the artifact. A heartbeat sensor is critical to this artifact and would provide the bulk of the data needed, as well I think it forms the most important connection, since I am looking to create an intimate notion of connection. The other advantage to using the heartbeat sensor is that it is a discrete sensor that doesn't require a lot of preparation to use, it's easy and in order to form a seamless connection I want to avoid complex mechanism. The bulk of the work would be

to translate the sensor data into output meaning the arduino or the microprocessor would have a minimalistic code which would take in values from the pulse sensor and observe them over time. After observing the data over a meditation period will be what determines the output of the artifact. I could have used conductive handles but I prefer the idea of subtle sticky sensors resting on the pulse of our heart instead of something which has a holding onto kind of quality.



In the course of researching for this project I came across the tangible media group at MIT, a couple projects stuck out for me. reSpire a 2019 project by Kyung Yun Choi, Valentina Sumini and Hiroshi Ishii, this project observes breathing and brings tangibility to their invisible psychological state. A silk sheet is draped over a drum like rim which in turn inflates and deflates to the rhythm of your breathing not only this but it also observes hand gestures angling itself in different ways, shaping the form of the breath differently depending on the gestures. A simple concept and executed marvelously, not only does it have an anti-machine like experience but it also invites interconnectedness with ourselves and others, by creating a personal like to us and a playful output for others to interact with. They describe in their project summary that not only does it encourage an inner understanding but it also creates an empathy by allowing the interactions of

others and observance of others in a shared space. This project is well suited to be a therapeutic experience since, not only is it calming and beautiful to look at but breath itself is an incredibly powerful force which can move us to tears when it is interconnected with a visual experience. The whole project comes together to make a deeply powerful interactive art installation, in the picture below we see how they project lights onto it making it not only interesting but beautiful to look at.



SpeakCup is a project which is on the surface not evidently connected to my own project. It isn't an object which grows or changes form based on user data, however it is an object which captures user data and its output is based on a change of form, of course this change is user driven. SpeakCup is a digital voice recorder which doesn't rely on traditional buttons or toggles to record sound but rather on its form to declare its function. When the cup is bent inwards, it captures sound much like an ear would, here we see that in this project form is equivalent to function. Not only this but when SpeakCup captures sound it gives the vibrations an embodied quality, lights in well of the receiver. Then when the cup is bent outwards it releases the captured sound from before, giving a kinetic quality to the recording and releasing of sound. I love the creativity of this project, not only does it give the form a function but it gives every portion of the process a form, the tangibility of the sound in the lights, and the release of the forms in the kinetic act of bending the cup outwards. This project was made by Jamie Zigelbaum, Angela Chang, James Gouldstone, Joshua Jen Monzen, Michael Carvajal, Kevin Rustagi, and Hiroshi Ishii in 2007.

This project could be an art instillation or an actual device used in the everyday, a kind of new age recording device.



LumiTouch is another project which explores another similar realm to my project, mainly the emotional interconnectedness. Although LumiTouch is well and truly in a separate realm, it does delve into the realm of lights for communicating feelings, and the idea of telepresence. LumiTouch are a pair of interactive picture frames which communicate with one another, if one user holds or touches the picture frame, the other lights up and delivers the sense of interconnectedness across space. This semi ambient display transitions the background emotions in what touching the frame means to the person to the foreground by lighting up the frame and giving it an extra personal presence of the other. As his project description explains, LumiTouch explores emotional communication in a tangible form, something that I myself am trying to explore with my paper heart. Although in this particular project LumiTouch explores the connection between two people, I think that their use of touch to communicate emotions is exactly the kind of interface to interaction relationship that makes projects like these so interesting. The ability to see the deeper meaning behind seemingly simple or unremarkable actions, and translate those into the emotional and impactful outputs. This project was headed and created by Angela Chang, Brad Koerner, Benjamin Resner, XingChen Wang, and Professor Hiroshi Ishii / 2001.



I think my project is unique from the projects I've explored and researched above, mainly because I explore the emotional data of the heart, and I try to create an external physical representation of that while also creating an interface which delivers its output in a discreet and almost mysterious manner. While it's not as technically proficient as reSpire or as dynamic as SpeakCup in its form changing, I personally think that forming the association between our bodies and our emotions and having an intermediary between those two is a fascinating realm to explore. I think it has the potential to explain and make clear to us parts of ourselves that may be completely unknown to us. I hope that this object will be confusing, I hope that the machine or the user misunderstands one another and inspires multiple revisits, that's why in my project I hope to leave a certain level of ambiguity. This ambiguity is in the discrete processes of the machine under the paper heart, I want the user to question the result and use their interaction as a moment for self reflection on their personal state. Since we are dynamic beings no interaction will be the same, and all the more so if we are being fed data by the paper heart. So all in all I hope this project will challenge us on a personal level and give rise to a self-critical reflection while also being a looking glass for our inner hidden world.