

Memory Tree

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ABSTRACT

The project, Memory Tree, is an interaction installation in which people can share their stories through the tree with their pulse input. After inputting a story, Memory Tree will give another story which has similar pulse rate inputted by others. The project basic background assumption is that similar heart rate variability relates to similar emotions. Therefore, people can receive similar emotional stories to their emotion. This project aims that people can feel comfort by reading other's similar emotional story.

Author Keywords

memory, moment, pulse, BPM(beats per minute), HRV(heart rate variability), emotion, story, share, social interaction

ACM Classification Keywords

design, technology, final project, documentation

INTRODUCTION

Memory Tree is an interactive installation project which explores emotions of humans. I'm very interested in human feelings and psychology. I have worked on several projects that explore human's emotions- happy, sad, depressed, hurt, love, etc- like the projects In-self and Out-self, Hurt Over Protect and Two-faced One. In this project, as a result, I aimed to communicate with participants through interactive actions rather than only presenting my ideas.

IDEA BACKGROUND

When I came to New York at the first time, I was excited about being here. However, after few months, I found myself getting depressed because of loneliness even though I could meet amazing people here and become friends with them. I wanted to talk to friends about my feelings, but it was hard to have sympathy with my condition. In addition, lots of friends are having their own busy and harsh life that make us hard to hear others stories carefully. Also, people who know us tend to judge us from the stories rather than just understand us. Therefore, I think anonymous people who have similar feelings can be the best person for sharing

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our stories and being consoled from their stories. As a result, I try to build a project that can share their feelings and stories, and they may be able to find the tree of stories will have numerous story leaves which indicates our society- full of memories, moments from us.

RESEARCH

For the project's concept, sharing story connected to emotion, research was toward to study heart rate, emotion and the relationship between them.

Heart Rate

Infants (0-12 months)	Children (1-10 years)	Broad Age (11-seniors)	Well-trained Adult Athletes
90 - 130	70 - 130	60 - 100	40 - 60

Table 1. Heart Rate by Age (ref. Pulse - Wikipedia)

Normally, BPM is from 60 to 100 (See Table 1.) That means participants usually input heart beat between them. Therefore, I can code the heart sensor part with heart beat range from 0 to 200 which can cover all.

Relationship between Heart Rate and Emotion



Chart 1. Emotions Model (ref. Emotions & Physiological Monitoring by Exmovere Holdings Inc. Sep, 2009)

HRV and GSR affect people's emotion followed from the chart 1. High HRV tends to indicate positive emotions while low HRV relates to negative emotions. HRV and GSR are hard to get information on through simple sensors that people can easily interact with it. Because of this, the project focused on heart rate which can be detected by a pulse sensor used in various projects. According to the research of "Emotions & Physiological Monitoring", it says, "Various emotional expressions produce different

changes in autonomic activity: Anger(increased heart rate), Fear(increased heart rate) and Happiness(decreased heart rate).” The surprised part of the research is that decreasing heart rate connects to relaxation and happy emotion which have lower heart rate than sadness. As a result, the connection between heart rate and emotions are real physical body process even though it needs to develop stronger correlations. Thus, the project assumed that similar heart rate can convey similar feelings which is the project’s main concept.

PRECEDENTS

1. Pulse by Red Pepper Heart

The project, Pulse, shows a pulse sensor can easily interact with people and attract people to engage with it. The participants seemed willing to put their finger on the green light which is a pulse sensor(see Red Pepper Heart. Project “Pulse”. (2012) <http://vimeo.com/60514704>)to interact with an installation ball. It demonstrates that the pulse sensor is an effective way to make people engage in the project through feel and touch which are influential to their emotions.

2. The Strangers Project by Brandon Doman

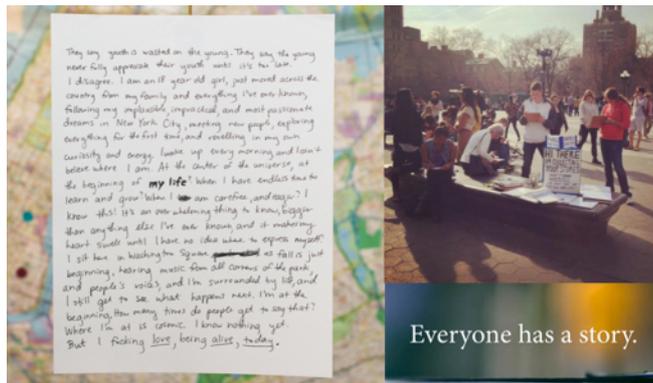


Figure 2. The Strange Project

The Strangers Project collects stories from anonymous people to make journal entries. It created Facebook Page that people can follow. Therefore, people following it are able to see the various stories which are true- the only instruction set for strangers. Also, it collects the stories in an analog way that people can be more emotional than inputting by technology (see Figure 2). From the project, Memory Tree influence to have inputs of strangers’ anonymous stories that aimed participants to feel comfortable and free while they are writing. The Stranger Project is a successful example to collect stories from strangers and share them through technology. Compared to it, Memory Tree requires digital inputs but it provides an analog printed paper right after people interact.

3. Humans of New York by Brandon

Humans of New York is also one of the precedents for Memory Tree project for two reasons. Firstly, it has no specific questions, but it collects stories by interviewing



Figure 3. Humans of New York

people briefly. Even though it has no exact question that lead the random story, but still it brings lots of interesting stories of them and touching stories despite people doesn’t intend it. It inspires me not to put specific questions forcing people to think about emotional side. Thus, Memory Tree only provides 2 clues, showing the title of the project(Memory Tree) to them and informing they will input the stories with their pulse rate.

PROTOTYPE PROCESS

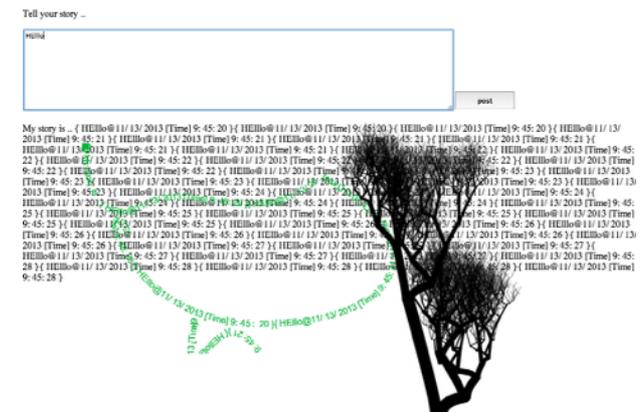


Figure 4. 1st Prototype

First Prototype : Web version

The first prototype was built by using HTML, JQuery and Javascript. It was made as a website because it is easy to interact with many people at once. Additionally, it used input texts to build shapes of a tree and the leaves (see Figure 4). However, a problem of the tree with texts was that the texts were hardly readable and also too complex to build the shapes that can be recognised as a tree and leaves. In addition, building a website is not a proper choice for the project because inputs needed to be processed by a person. Therefore, the first prototype’s failure led to thinking more about how to make people interact with the project.

Second Prototype : Processing + Javascript Version



Figure 5. 2nd Prototype

The second prototype was created with Processing and Javascript. Green leaves are added to represent one's inputted stories(see Figure 5). Moreover, when someone hovered a leaf over, the story inside it appears by falling down to the ground.

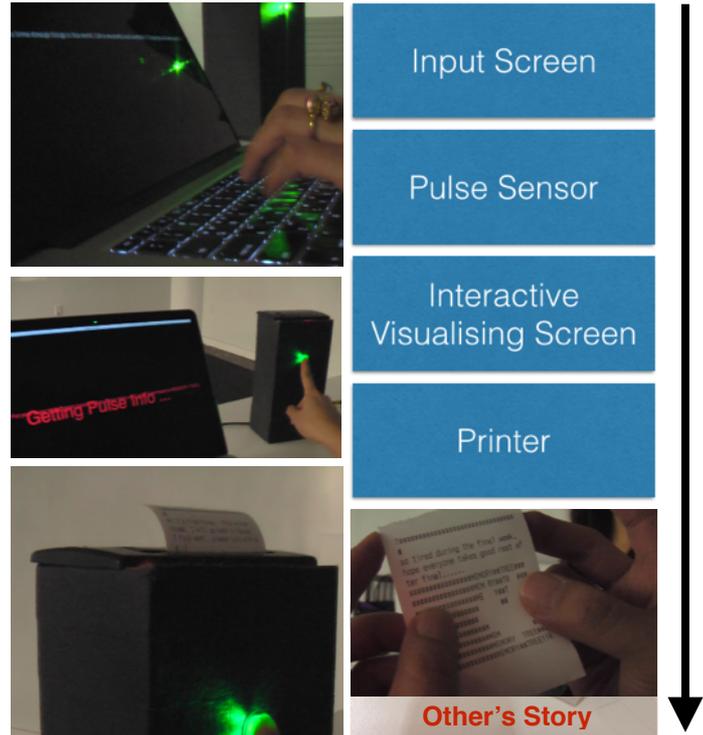


Figure 7. Process of Interaction

Final Version : Interactive Installation

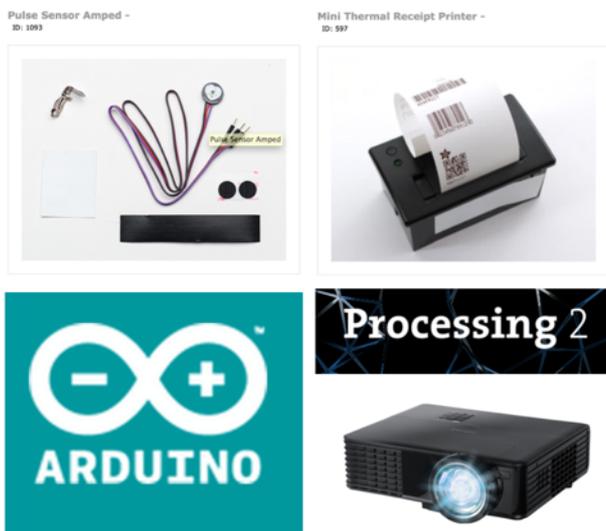


Figure 6. Mediums : Pulse Sensor, Thermal Receipt printer, Arduino, Processing, Projector

For the final work, the project moved on to interactive installation project. A projector was used for putting the tree on a big scale and processing worked for making visual trees. In order to build a physical way of interaction, a pulse sensor and a mini thermal receipt printer were used with Arduino.

How the mediums have been combined to the project is shown as a process of interaction(See Figure 7). Firstly, Processing created 2 windows; one for input screen and the other for the projector screen which shows interactive tree. Participants are allowed to input their stories through the input screen(See Figure 7 top-left picture). Next, they are required to put their fingertips to the pulse sensor box(See Figure 7 middle-left picture). Lastly, the interactive tree will show one kind of leaf on the projected screen(See Figure 8). In other words, one type of leaves indicates one person's story. At the same time, the participants will

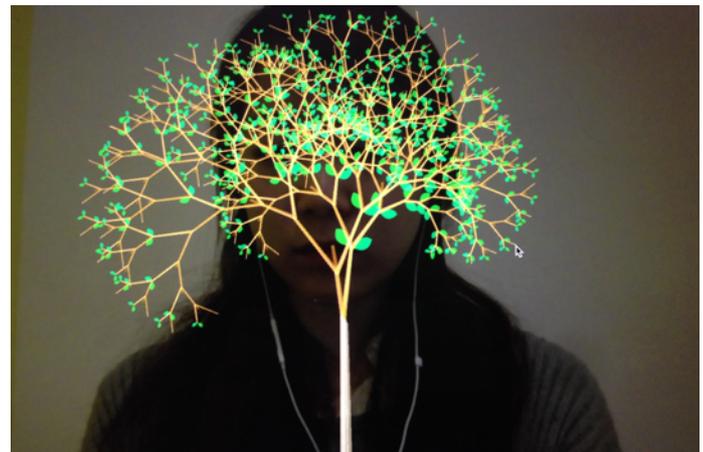


Figure 8. Projected Screen on the wall

receive another story of others which has similar heart rate in it through the printer(See Figure 7 bottom-left picture). In the project, a story with similar heart rate assumes that it has similar emotion in the printed story.

For applying whole idea to the project, I struggled to compare all the inputted heart rates and match stories to output by coding with Processing. Moreover, communicating between Arduino and Processing was the hardest part to execute all the process correctly. Also, the problem of it was hard to make people to understand the process without any instruction.

As you can see on Figure 8, the background of the projected screen is live video of the participant who is

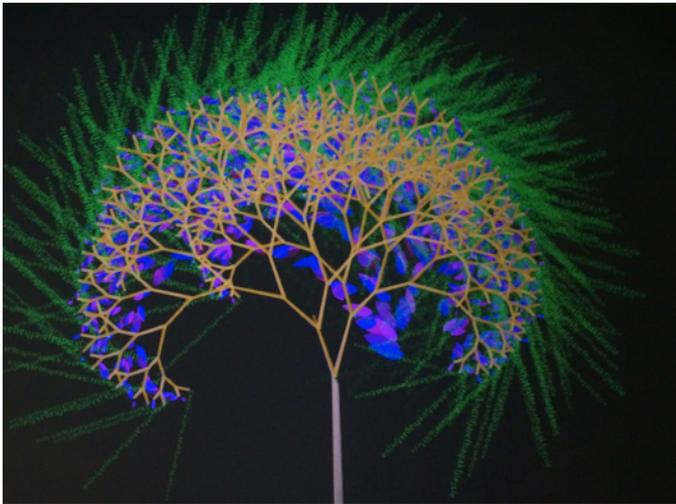


Figure 9. Projected Screen on the wall while typing stories

inputting story in front of camera. The intention of putting his or her face on the background is that effect on their feelings to write deep emotional stories they have by facing them through the projected screen on the wall. The concept came from the idea that people usually find it hard to tell a lie when they are facing themselves through mirrors.

In contrast with the colourful interactive projected screen, the input screen just shows black screen with white types appearance while you are writing. The solid black colour aims to affect people to think stories they have in their deep thoughtful mind.

In addition, green texts will appear on the projected screen while a participant is typing. The green texts are actual texts that the person's typing. It intended to express a living tree when we are communicating with ourselves and with others. The colour of leaves programmed to make relationship between pulse rate, so even each of leaves indicates their heart rate inside.

INTERACTION INSTALLATION VIDEO

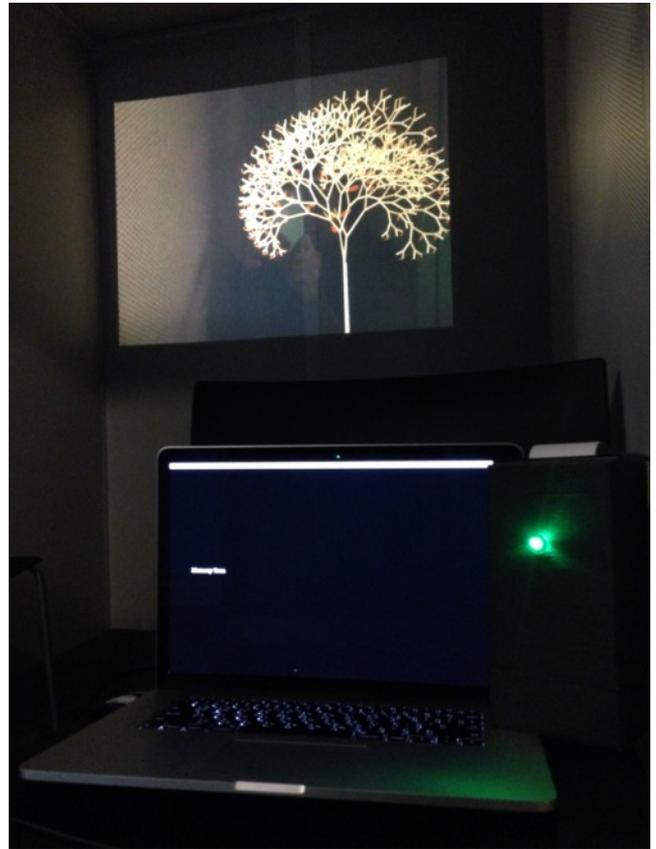
<https://vimeo.com/82056324>

CONCLUSION

Final installation was successful because people really enjoyed the concept of receiving similar emotional stories that they can feel a connection between the stories they received and their emotions. Specifically, they asked me to take all the story papers to keep with them. Also, the visual effects attracts people a lot to feel emotional ways with classic background music. Therefore, they could engage with the project with full of emotions even though the project didn't ask any questions leading them to think specific one. Their feedback was that if they can look over all the stories on the website, it would be better to see other's stories even though they are not in the installation place.

FUTURE DIRECTIONON

I would like to take the project further by placing it outdoors which is more public space and open space that can have more active interaction. Also, to build a website for Memory Tree that people can see through the website and see what kind of story has what level of heart rate.



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