<MOOD PROJECTION>

<PROJECT PROPOSAL>

*<**T**he **L**ast of **U**s>*

<24 March 2016>

TABLE OF CONTENTS

Contents

<MOOD PROJECTION>

<The Last of Us>

< Harrison Lisewski - 43590245
Kent Yeo - 43708732
Weng Hou Chan - 43783337>

Physical Computing & Interaction Design Studio proposal

<24 March 2016>

Introduction

We are a team of 3 and our focus for this project is on the topic of 'Mood and Emotions'. Understanding how we can incorporate technology that can read and collect data through a person's mood or emotion. Each individual human mind displays different mood or emotions on different items. For example, a song can produce different effect to a person and can even change the mood when the song ends.

With this, we have decided on this direction in studying how to devise a project that can read a person's before and after mood when they listen to a piece of music.

Our approach to this topic, involves understanding that music changes a person's mood. Examples are people simply listen to upbeat music to boost their mood. (Refer to reference links). We will be utilizing the EEG wearable device and record their brain wave when they listen to a music piece.

Music inspiration from your subconscious.

Background Material

Our brainstorming brings us with the idea on collecting data on people's mood when they listen to certain music. As our project direction is towards the topic of 'Mood and Emotion', we have decided to explore he concept of using technology that can read the brain waves or mood.

Other idea concepts

- Brainwave music for disabled people
- Letting music change a person's mood
- Machine Learning, before we can tell a machine to predict what song to play based on our emotions, we need to get a network of data OpenMindCommonSenseProject

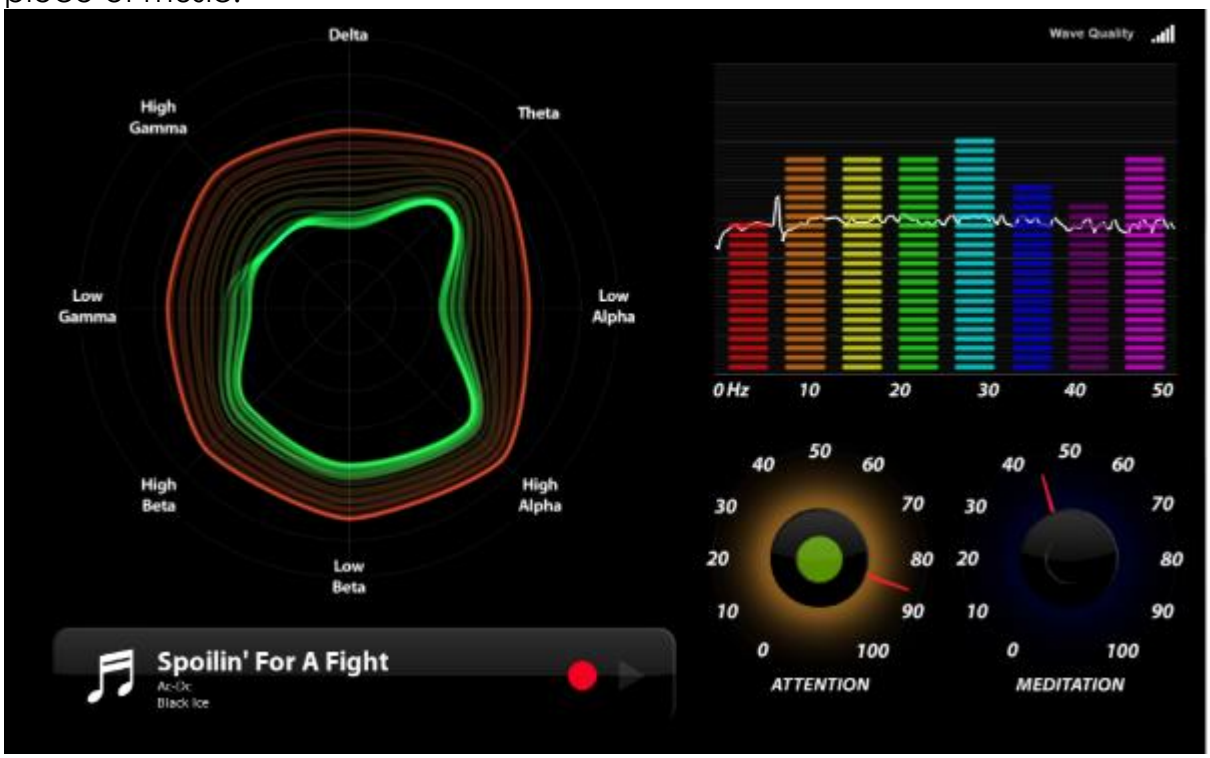
Our original idea was to develop a system where music will be chosen and played based on our current emotional state in order to alter their mood in a calculated manner. Because of the time limit of this project we realized this is not yet possible, as this sort of technology would need data from thousands of people listening to thousands of songs which could take years to collect. We can, however, facilitate the development of such a system.

Our project is about participants listening to the same pieces of music together while having their emotions tracked and recorded by an EEG.
We will be utilizing the availability of this EEG device – 'Mind Wave' from the university itself. Refer to Reference link for more details on 'Mind Wave'.

Mind Wave device

Our concept is, in a way, inspired by how that sort of technology could initially be developed. So within our project we may be able to build a database from the data collected, and with the help of machine learning, be able to predict music based on our moods, however this is not our concern right now.

Current recording is in the form of wave and graph when a user listen to a piece of music.



Example of a recording in graph

We are now looking at just visually implementing the recording of a person's brain wave in the form of a color spectrum in to a ball. This swirling color ball will then be uploaded onto a big screen display where everyone can see.

The display will show everyone's collected 'color ball', where each individual will have their own unique emotion or mood prior to listen to the same music. Imaging a screen of multi-colored swirling balls that reflects each individual that has listen to a particular song.

Example of brain wave recording in color spectrum

Example of color spectrum design idea

This idea was brought about from the previous year heartbeat project which they display each individuals current status heartbeat in real time. So we decided to do the same by displaying the user's current mood-color ball.

Audience

Currently we think that our work will appeal to those who are curious about how the human mind works, personal preferences or emotions itself. The exhibit would be appropriate for users of all ages although we expect most that turn up would be within the age 15 to 50.

We would like to give the audience a visual representation of the emotions they produce while listening to music, and at the same time being able to compare those "visual emotional results" with other participants at the present time. This would enable us and the audience to perceive the contrast and/or similarities of our personal preferences we have about the same pieces of music.

We envision that the project will consist of comfortable chairs, headphones and EEGs. A group of participants will sit together but not looking at each other. They will put on headphones and EEG's respectively and listen to the same pieces of music. At the end of the playlist, the participants will be able to see a visual representation of their emotions that's were being tracked while they were listening to the music.

Comfortable 'Egg' chair

Letting the user listen to music using headphones to cancel out noise from the surrounding as we are showcasing this project in an open area.

While this project is still in its early stages, we imagine that it would be encountered in specific areas such as museums or science labs. We assume, at this point, that people of interest are those with a curious mind about the topics listed above in the introduction and those who have actual use of it to obtain scientific data. However, we are playing with an idea where it could be turned into a social item for the average music lover. To elaborate, the entire project could be turned into a portable product which can be brought home and simply connected with others via a music platform, computer and internet. Think of it as an online social music app which has an additional interface device, EEG.

Project constraints

Based on the academic nature of our project, we want the results to be as accurate as possible. Borrowing the signal to noise ratio analogy, where we will call the results we want as the *signal* and the other factors that mess up the data as *noise*. Our goal is to reduce the *noise* as much as possible. Some of the effects of a group participating together is that, the outliers emotions may be affected if he/she realizes that their emotions are different from others. E.g. a person may be embarrassed about enjoying a song which the rest of the group does not.

While we have not worked with the EEG, brainwave and hardware yet, there is a high possibility that it may not be sensitive enough to detect all related emotions. However, we do not think it will be a high risk, at most our data will not be able to deliver a wide field of emotions but good enough to deliver the experience we are looking for.

Some problems we foresee but are currently unable to come up with solutions yet are getting enough EEG devices and being able to calibrate them in a short amount of time for each group of participants.

Emotions are personal to a person. Therefore it is logical to assume that there may be some issues with participants accepting their emotions being revealed. Further feedback and testing will need to be done before we can decide on how to proceed. But an idea to mitigate this would be to represent the raw data in a reduced clarity. For example, using red to represent anger and yellow for happiness. We could take it further and classify emotions into two groups, negative and positive.

Relevance to theme

The project attempts to combine the topic of Mood and Emotions with technology and a sub focus on data gathering. It allows participants to explore emotions, something which every human experiences personally in their own minds, into visual expressions in a different manner. Being able to visually display mood and emotion is a very interesting way of getting people interested in this type of project. Rather than simply using mood or emotion as an input, we expect to be able to output emotion in a way that is thought provoking and aesthetically pleasing.

Project Milestones

The first major milestone would be to test the equipment we have to work with, understand it and explore what we can and can't do with it.

The second would be to design the system, how would we structure it in such a way where we will get accurate data about emotions and music.
Some examples are discussing the fine details such as, which songs to choose, duration of the songs and also the duration of the whole procedure.

After the completion of the design which is the second milestone, the preemptive plan, the next is the third milestone, where we test our prototype with participants.

The fourth milestone would be refining, rinse and repeat, redesign and test, ironing out the kinks in the prototype.

Individual Contributions

While we prefer to have "everyone participate in solving the same problem, giving individual opinions about a single problem space" rather than segregating and specializing the workload. Some general guidelines would be, Chan Weng Hou will be taking the role of a programmer and responsible for working with the EEG. Kent Yeo will be taking the role of a technician, running tests for the EEG, setting up all the required equipment and documentation for the project group.

Chan Weng Hou
These couple of years I have taken an interest in human behavior. As such, I have a modest amount of related knowledge gained from reading books and articles. Some of the areas I have knowledge about are about the subconscious mind, some theories on its strengths and weakness and how it works. How the mind works, what causes a change in behaviors, how are habits formed and broken. In summary, I bring to the table related knowledge which may be useful to this course. Another one of my strengths is programming, while there seem to be a high probability to have a need for a programmer for our given topic "Mood & Emotions" and/or "Early Learning", the programming language would probably differ from what I have worked with, however, it shouldn't be too much of issue to adapt to whichever language we would be using. Among my many weakness, the ones which would most probably be revealed in the upcoming weeks for this project would be my lack of skill and knowledge with physical prototypes, I am generally not very good with my hands, in constructing prototypes or drawing in fact.

Harrison Lisewski
I've spent the last few years at university doing a lot of coding as well as database management and some art related courses. I feel as though these are good areas of study considering the project we're doing. We'll definitely need programming skills and possibly database knowledge if we end up collecting data. My experience in art includes graphic design skills and studying what makes a certain display pleasing to the eyes. This can also be a valuable skill when it comes to building the prototype and creating a presentation that draws people in at the exhibition. I also happen to be very interested in the area of mood and emotion which will make working on this project exciting.

Kent Yeo
As a team member, I can bring to this project my knowledge in building a project from scratch. Looking into the different aspects of the requirements and coming up with logical answers that can streamline the project. I am also good at hardware building and hands-on equipment usage if there is any need. I can do minor coding and I am good with documentation. I have

done multiple projects before and usually I am the one handling the UX/UI of the project.
My weakness is programming on a large scale. I do not have a strong skillset when it comes to programming. But I am open to learning and understanding how code works thus enabling us to complete the task at hand.

References

1) How Music affects our moods

http://www.healthline.com/health-news/mental-listening-to-music-lifts-or-reinforces-mood-051713

2) How music changes your moods

http://examinedexistence.com/how-music-changes-your-mood/

3) EEG device – Mindwave

http://neurosky.com/

http://store.neurosky.com/

Below are some idea concepts that uses brain waves to draw and or color art.

http://thecreatorsproject.vice.com/blog/this-art-project-lets-anyone-paint-with-brainwaves
http://www.instructables.com/id/Brain-Wave-Drawing-Machine/
http://www.braintoneart.com/learn
http://neurowear.com/projects_detail/mico.html

When we are trying to deal with the world of emotion, we can often forget or be confused about the differences between moods and emotions. Getting clear on the differences may help us understand ourselves, and understand others better.