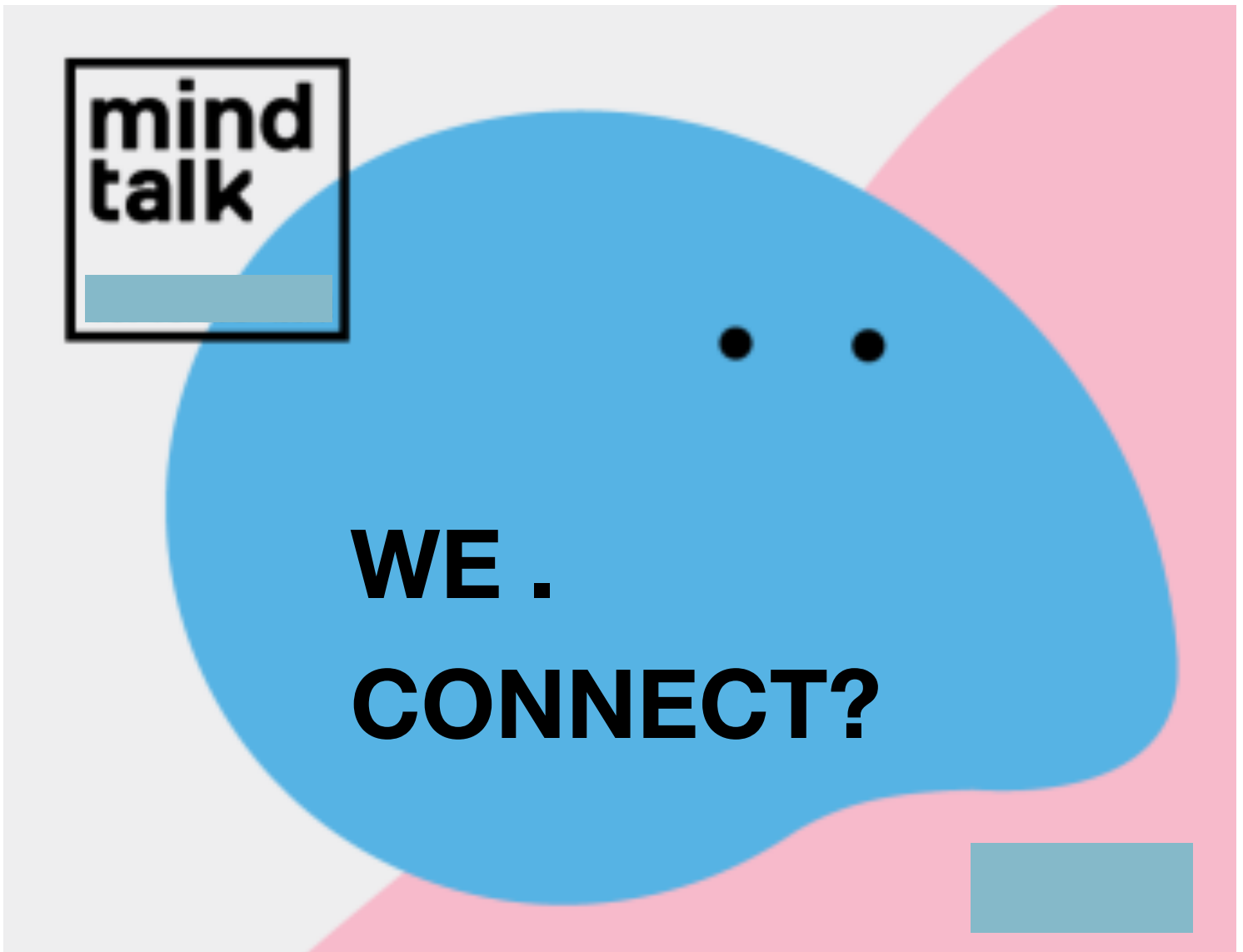


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WE . CONNECT?



# Project Proposal

Prepared for: CART360 2019

Prepared by: Xiaojie Wu

October 2, 2019

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## WE . CONNECT?

### WHAT AND WHY

Since the birth of computers, people have been spared no effort in digitalizing this world, building mathematical models of the physical world, storing digital information, and using data and information to transform the world. Wearable smart devices extended the human perception function. it is the way people digitalize themselves. As this process continues, smart applications are and will replace everything.

This phenomenon reminds me the science fiction movie "HER" in 2014. In the future, on the streets, in the subway, on the flyovers, everyone looks down on phones. They are whispering, not with people around them, but with their own mobile phones. People are immersed in the social space of human-machine dialogue, without the cost of real human communication, and the customized service of the machine, so that everyone can enter the self-enclosed house space. The world doesn't need others, and the smart apps you buy are enough to satisfy all your emotional social needs. In this movie, "Her" is the existential dilemma, people are creating new kinds of immersion that are not fundamentally human. can you imagine an operating system (OS) that is your one true friend and soulmate? how desperate it is. Virtual intelligent services bring more to human, or human lose more. it is a topic to discuss. Perhaps, only when human beings begin to accept their own imperfections and begin to tolerate a less idealized social relationship between people, a truly comfortable human-machine era will come.

This project "we.connect?" responds this social imperfections of human beings. Dating and relationships are already complicated enough. The social media "addiction" is not helping. Talk to people in person is challenging. This system is aimed to help people who are in dating phrase out of communication disabilities and smooth the relationship gap between the two. The applicable scene will be any place where restaurants, clubs, parks, classrooms, apartments, and libraries provide dating venues. The brainwave sensor in the device will be installed on the heads of the two people. This is to collect brainwave information to analyze the psychology of the parties. There is also a bracelet in the device, which is installed on both sides of the wrist.

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## WE . CONNECT?

If one of the brain waves shows an excited state, attention is concentrated. Even people who are often poorly connected can behave as usual, or faceless, or he tries to control himself without showing interest. Because the usual social rule is that if the other party does not have the same feeling, how embarrassing the party that is just interested, the situation will become worse. But this device knows what the truth is. After collecting the information, the system will send the success signal to the opponent's bracelet. At this time, the bracelet will become hot. The way of heating can effectively protect information from leaking, and only pass information to the party that has the right to accept without an embarrassing situation. If it is vibration, vocalization, flashing, and deformation, it will make the other person perceive the information and cause psychological discomfort between the two. Not-interesting signal will never be sent in this case. that means, if you are talking to other person for 20 mins but you have never got a heat from your wrist, then the message is clear that the other person is not that fond of you. you might be a common friend with him/her but not a romantic one.

Only if both wrists are heated, the lights on the wrist are on green. a music will be playing in this case.

### Sensor evaluation

I am going to use the NeuroSky MindWave Mobile 2: Brainwave Starter Kit. it provides the brain wave sensor and a SDK for making my own application base on the brain wave wireless sensor. it has dual mode module and support iOS, Android, PC, and Mac platform. it detects raw-brainwaves, eeg power spectrums (Alpha, beta, etc.), esense meters for attention, meditation, and future algorithms. humans are discharging when they perform various physiological activities. When the heart beats, it will produce a voltage of 1 to 2 millivolts. When the eye is opened and closed, it will produce a voltage of 5 to 6 millivolts. When thinking about the problem, the brain will produce a voltage of 0.2 to 1 millivolt. If you use a scientific instrument to measure the potential activity of the brain, then a wave-like pattern will appear on the screen. This is the "brain wave." Brain wave activity has certain regular characteristics, and there is a certain degree of correspondence with brain consciousness. Under different states of excitement, nervousness, coma, etc., the frequency of brain waves will be significantly different, about 1 to 40 Hz. According to different frequencies, brain waves are further divided into  $\alpha$ ,  $\beta$ ,  $\delta$ .  $\theta$  wave. When people are highly concentrated under certain pressure, the frequency of brain waves is between 12 and

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38 Hz. This band is called  $\beta$  wave, which is the brain wave of "consciousness" level; when people's attention drops, they are relaxed. In the state, the frequency of the brain wave will drop to 8-12 Hz, which is called  $\alpha$  wave; after entering the sleep state, the brain wave frequency further decreases, and is divided into  $\theta$  wave (4-8 Hz) and  $\delta$  wave (0.5~ 4 Hz), they reflect the state of people in the "subconscious" and "unconscious" stages. It is precisely because brain waves have such a characteristic that changes with mood fluctuations, and human development and utilization of brain waves becomes possible. What is shown in the movie "Avatar" is actually a technology called Brain-Computer Interface (BCI), which means establishing a direct connection path between the human brain and an external device such as a computer. Through the analysis and interpretation of EEG information, it is further transformed into the corresponding action, which is the basic principle of using "ideas" to manipulate objects. the signals from the sensor in this case go to the Arduino based bracelet.

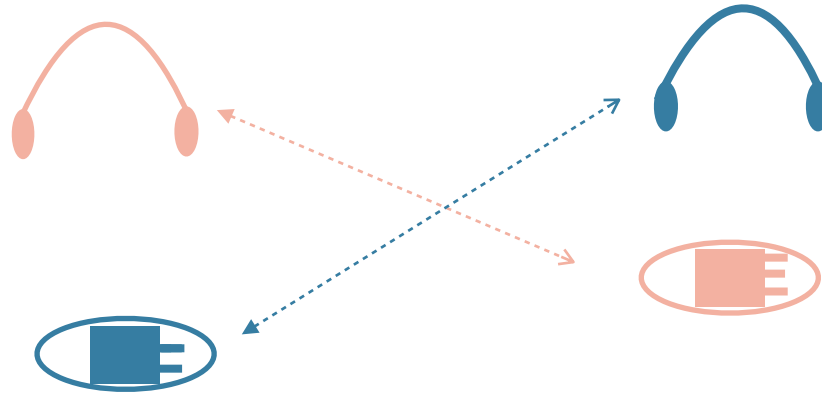
### Interaction frames

frame ONE: installation of two set of devices to two people.



frame TWO: start collecting attention or emotions from brain wave sensor and send the signal to the paired colour bracelet. Arduino devices receive it and analyze it.

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frame THREE:

if the frequency of brain waves is between 12 and 38 Hz. This band is called  $\beta$  wave. The higher that the frequency is the more interest shows. when people's attention drops, they are relaxed. In the state, the frequency of the brain wave will drop to 8-12 Hz, which is called  $\alpha$  wave; after entering the sleep state, the brain wave frequency further decreases, and is divided into  $\theta$  wave (4-8 Hz) and  $\delta$  wave (0.5~ 4 Hz). when arduino wireless device receives frequency higher than 12Hz, the chance of giving a positive answer to other person are there. the higher the better. but when the frequency drops under the 8hz, the person who receive this would better take an excuse to leave. ;)

**12 -38 HZ**

**8-12 HZ**

**4-8 HZ**

**0.5-4 HZ**

**interested**

**so so**

**bored**

**terrible bored**

frame FOUR:

Arduino device get the frequency to decide if the heater component starts working or not. when the frequency higher than 12. heater starts. the higher the hotter. when it drops below the 10Hz. heater stop function. the bracelet cool down to normal temperature.



frame FIVE:

when Arduino devices get both side frequency higher than 12HZ at a moment. the little green light on the bracelets are all on.

the frequency of brain wave is greater than 12Hz.



frame SIX:

when Arduino devices get both side frequency higher than 12HZ at a moment. background music is on.

## MUSIC

frame SEVEN:

when person A's bracelet get hotter. it might rise A person's attention and curiosity to person B. it feels like that you share a secret with person B. only you know that. it bonds with intimacy feelings between these two. it might cause the B person to receive the heat from A. this is how this device helps people with their social love life. haha.

frame Eight:

when person A's bracelet never changes. it also helps people to know it privately. to avoid the pressure for being refused and awkwardness. either ways these device helps. To use a secret "mind reading" devices on each others is exciting thing to the people who want to try it. it changes or improve the way that people build intimacy relationship with others. changes the way people communicate with others. people get move valuable feedback than ever. if you know that you wound not get hurt any way, you would most-likely intent to build real human to human relationship with others. even thought you got bad experience before, you might still want to give yourself a shot to do it again. would you? it is a good way to enhance the social activities.

### Three similar projects

#### A. Kansei Analyzer

A Japanese company called Dentsu ScienceJam Inc. it provides R & D departments and marketing departments of companies with simple evaluation kits "Kansei Analyzer" and "Valence-Arousal Analyzer" that can analyze sensibility from brain waves. It can be widely used for product development, benefit creation, evidence

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construction, PR measures, etc. Kansei evaluation index: Various sensibility estimated from EEG (stress level, interest level, comfort level, concentration level, sleepiness level, calmness level, liking level, etc.) can be evaluated. In addition, "positive / negative judgment" and "motivation increase / decrease judgment" are prepared as task before / after judgment devices. Furthermore, it is also developing company-specific evaluation indicators in a joint research format upon request.

In addition, it offers evaluation improvement services that combine EEG and eye tracking devices.

## **B. MinFlex**

At the 2009 Consumer Electronics Show (CES), Mattel, the world's largest toy manufacturer, launched MindFlex, a brainwave-based toy. MindFlex is a brainwave control toy. Players can use the "will" to let the ball float into the air. The more focused the idea is, the higher the ball will float. With an auxiliary manual control device, the player can control the ball through various obstacles. The brain waves are captured with the enclosed EEG headset, which allows the user to control an air stream with their concentration, thus lifting or lowering the delicate foam ball. Scientists have questioned whether the toy actually measures brain waves or just randomly moves the ball, exploiting the well-known illusion of control. However, despite the Spiegel/Haynes experiments, supporters of the game believe that the headset does read EEGs (it uses the same chip as the MindSet from NeuroSky and has been used in homebuilt EEG machines).

<https://www.youtube.com/watch?v=YWV-XZGgARc> 6:13'

## **C. Homemade Mind Controlled TV Remote**

As the name remind, this project use brain wave sensor to get a certain range of brain wave frequency. if it gets it, arduino device sends signal to the TV by simulating the next channel button from remoter.

<https://www.youtube.com/watch?v=ThHrMW6Rtgg> 5:08'

## **refections**

My project is similar to these three similar projects in that it uses brainwave control sensors to interact with the outside world, generate behaviour, feedback results and affect the environment in a certain levels.

The difference is that my project is more about changing the way people create intimate relationships, making the otherwise complex and stressful process easy and fun. Encourage people to interact and build natural relationships between people. Replace the problem of isolated island autism in society today. Let people prefer to build real social relationships. Then create a harmonious social relationship.

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it helps people to get feedback in a date instantly and privately. To avoid the pressure for being refused and awkwardness. Either ways these device helps. To use a secret “mind reading” devices on each others is exciting thing to the people who want to try it. it changes or improve the way that people build intimacy relationship with others. changes the way people communicate with others. people get move valuable feedback than ever. if you know that you wound not get hurt any way, you would most-likely intent to build real human to human relationship with others. even thought you got bad experience before, you might still want to give yourself a shot to do it again. would you? it is a way to enhance the social activities.

### installation reference

