

Hong Kong Student Science Project Competition 2022
Extended Abstract (Invention Design Proposal)

Team Number: JPE083

Project Title: Stay calm and wear gloves

Project Type: Invention Design Proposal

I. Background

Even if you are still a teenager or you are already an adult, emotion has always been a difficult subject for us to learn. For the majority of people, we can tell when we are feeling anxious or not. After having a strong sense of anxiety, we would usually find a way to relax and reduce our unwanted emotions. However, in our society there are still a group of people who are unable to cope with stress and anxiety.

The overwhelming emotion of stress could cause a serious problem for people with panic disorder, especially when they are in the crowd, public transportation or classroom. When panic attacks happen, patients will experience intense fear that comes with some other physical reaction, such as sweating, increased heart rate, trembling, etc. On one hand, these types of reactions may cause embarrassing moments for the patients. And on the other hand, these reactions may also intensify the stereotypes from the general public towards mental illnesses, which is definitely not what we would like to see.

We all agree that all mental illnesses are just a type of illness and it should not be stigmatized by the general public in such a way. Therefore, in order to promote social equality and the acceptance of mental illnesses, our group has decided to propose a device which could both sense the feeling of fear/ anxiety and calm their overwhelming emotion.

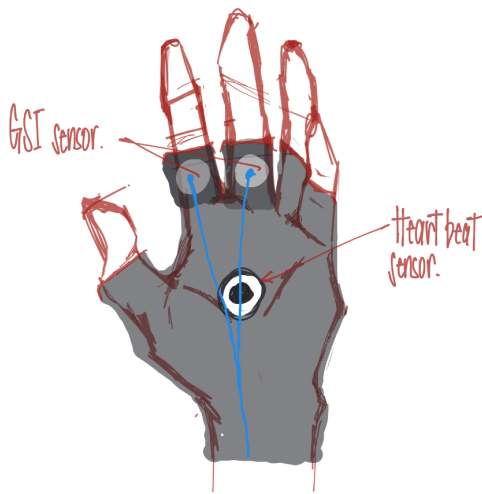
II. Objective(s)

The aim of the project is to help people who aren't able to sense or endure their emotions (For example: Mental illnesses patients) by detecting their emotions fluctuation and provide a suitable calming method. Although there are various forms of emotions, our group has decided to focus on when they're feeling melancholic, nervous or furious since these are the emotions that even the majority cannot control themselves.

III. Methodology

Our group has done several research on how panic attacks affect our body. We have found out that human heart beat, body acceleration and changes in sweat gland activity fluctuate with our sense of fear. In order to test the feasibility of our invention, we have bought a few related sensors (Heart Beat Sensor - MAX30102 and GSR Sensor - Grove GSR sensor) for experimental data collection. We would use different methods to stimulate the feeling of fear in our experiment participants, and in the meantime, we wrote a program to collect the data from our participants.

IV. Design of Invention



We chose to make our invention as a pair of gloves. We have considered that patients that have panic disorder may want to hide their mental illnesses in front of other people such as classmates and the general public. Therefore, we would like to hide all the “Scientific” Sensors inside a pair of gloves so as to protect the privacy of our user.

At the same time, our aim is to make a device where our user can use it 24/7. So we have also considered the flexibility of our hand when wearing this pair of gloves. Therefore, another design point is that we have chosen to make our device a half-glove so as to ensure our user could wear it to school or work without affecting the mobility of fingers / hand.

V. Application / Market Need

Our group has observed that mental health is gaining more and more attention in nowadays society. With a product that focuses on helping people with mental illness, our group thinks that our idea would help to promote social equality.

Our invention would help people with panic disorder to calm down by sensing their biometric changes and providing a suitable claming method, which in our device, we will calm our user by playing some soothing music. Although our aim is to help people with panic disorder specifically, we also believe that with a bit of emendation, our invention could be used widely to people with other types of mental illnesses.

Regarding the limitation, we believe that our invention has 2 major limitations. Firstly, playing music may not be the best smoothing method for everyone. Although our group members have all agreed that we would love to listen to some music when we are stressed, and there are actually several studies showing that listening to music is a good way to settle our emotions, we also think that listening to music might not be the best option for every user.

Secondly, headphones have to be worn for most of the time in order to get the desired relaxation. Since our group has come up with this idea of providing immediate calming after our device senses there's an overwhelming emotion, headphones cannot be taken down all the time.

VI. Conclusion

Even though our invention idea still has a few critical limitations, we will use our remaining time to figure out how to make this invention a more practical and feasible solution for people with panic disorders.