Prototype Documentation

1. Idea:

* Pradyuman
* Maasi
* Mall kid

My aunt (Mom’s sister) works as a teacher in a school of mentally disabled students. One day after work she was telling me about something that happened that day. A girl had a sudden panic attack in the corrdior and lied down on the floor, her heart racing. She refused to get up and my aunty knew better than to force her. Children with autism have these panic attacks and meltdowns several times and I wanted to come up with a device that would help the care-taker. I researched about it and learnt that once a child is triggered, their BPM increases by a substantial amount and thus, these meltdowns can be anticipated as soon as the child is triggered. This can be generalised to any form of anxiety, the only difference being that in the threshold values.

1. Problem statement:

* Anxiety tracker

Who : The girl from my maasi’s class (children suffering from autism or related illnesses)

What : Suddent meltdowns and no tracks of triggers

Why : Cannot understand themselves due to the turmoil of emotions once triggered

1. Constraints:

* Stability of pulse sensor: I bought the pulse sensor on amazon and had to spend a great time trying to figure out how to get stable reading. Due to the wire connections and external noise, the sensor often gave random readings.
* Comfortable to wear: Since this device is a part of wearable technology ( including those with mental illnesses ), it had to be compact, comfortable and not interfere with routine activities.
* Works across different networks since the person wearing it and the respective caretaker might be at different locations.

1. Solutions brainstorming

* Decibel tracker with location :

1. A device with a decibel tracker. Since a lot of children with autism (and related illnesses) scream during a meltdown, this tracker would detect the decibel volumes and once it reached above a certain threshold value, it would send an alert to the caretaker
2. It also had a feature that would turn on the location once the alarm is triggered so that the caretaker reaches the child in the least possible time.
3. This idea originated from a situation I saw at the mall. A kid around 5 years old was walking in the mall when suddenly he started screaming at the top of his lungs. His caretaker, who was at some other shop heard him but had trouble locating where he was until someone guided him. Such a situation could be tackled with this decibel tracker with location feature.

* Pressure sensor

1. This solution was a bit different. It was a stress ball with a pressure detector. The pressure sensitivity scale would change depending on how hard you press the ball. This would not only alert the caretaker but also calm the child down since a lot of kids choose to press their fingers into their palm in stressful or triggering situations.
2. Existing Solution

* Reveal for autism

I was not aware if the device I was planning to make already existed. I was researching about the technology I would need to calculate the BPM and the IOT knowledge that would be required when I was leaded to a site which advertised the Reveal band campaign. It is a similar idea for which funds are being collected (goal is 3 lakhs). Their idea was also to measure heart rate along with sweat levels and other bodily changes to predict meltdowns and to help anxiety.

The work on the prototype has not begun yet.

1. My device

* The final prototype that I decided on is the ‘NoDoubt’ Anxiety tracker.
* It is coded to send an alert to the caretaker everything the BPM goes above a vertain threshold value that can be changed depending on the case.
* It is a wearable device that can be worn like a band on your wrist

Final solution

1. Name: NoDoubt / Ease-it
2. Electronic Components used:

* Switch
* Charging module TP4056
* ESP8266
* Lithium Battery 1000 mAh
* USB cable
* Pulse sensor
* Jumper wires

1. Final detailed sketches:
2. Paper Prototyping images/videos:
3. Design Process
4. Source files (CAD, Programs, sketches, etc)
5. programming/CAD screenshots or screen recording(5 seconds)
6. Materials/tools/machines used
7. Skills used

* Electronics
* Programming (Java)
* CAD Modelling
* Internet of Things

1. Challenges faced and their solutions
2. Testing images and videos
3. References links
4. Images:

