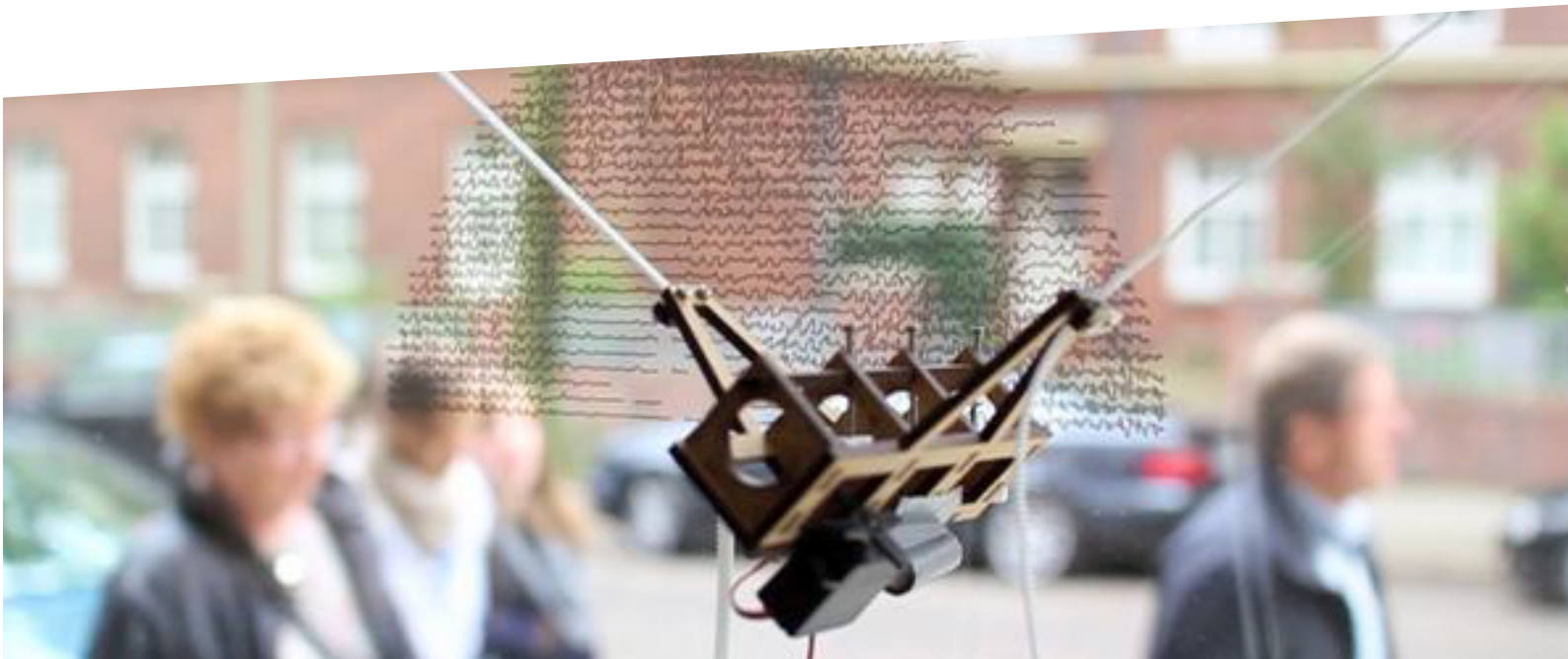


TEAM TAM

Following feedback from our last assignment we have decided to change the way the artwork is produced. Initially we had a small robot that created individual artworks for each user. However, considering our idea came from the need of a visual representation of your heart rate when using heart rate monitors we thought it would be more appropriate to show this over time so users can compare it easier.

We are now creating a drawing robot that hangs from the walls by two wires and moves across a single line plotting heart rate. One line represents one user. Users could come back and compare their different lines over time or we could collect different heart rate patterns from different users over a period of time, each contributing to the one artwork. Our idea steamed from the project below called Der Kritzler.



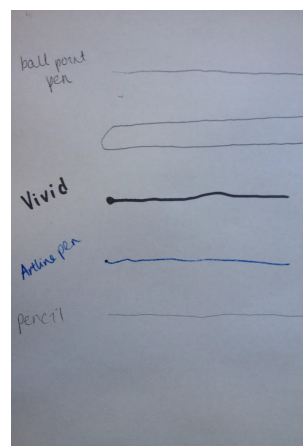
We choose a few things to concentrate on this week. This included the types of pen we were going to use, how we were going to create the dots and using a stepper motor to lift the pen on and off the page so we do not create ink runs.

How it works

The robot works by having one arduino board in the top middle inbetween the two pullys. On either side of this board there are two unipolar stepper motors which control the movement of the pullies. These pull a toothed belt to drag the pen holder below. the pen holder is made up of a stepper motor which controls the stamp of the dot being pulled off the page. The black pen is constantly on the page drawing a straight line.

Pens

After testing multi pens we have decided that the ball point pen is best to use. Initially we thought a black artline pen would be best as it would produce the cleanest line however when the pen is still it leaks ink. Because our project is done over a series of days and users the pen will often be sitting still on the page meaning the pen would leave large circles of ink on the page if we do not choose the correct pen. We tested using a pencil and it produced a really nice line however after multiple users the led would start getting blunt causing uneven lines over the page and eventually we would need to take the pencil off to sharpen it and put it back in the pen holder. The pencil will eventually run down and get shorter.



Materials needed

After doing research into existing hanging drawing robots we worked out the materials we need to create our robot.

- Motor mount and pen holder
- 2 stepper motors
- Various bolts and screws
- 2 toothed belt pullies
- Toothed belt to match
- Arduino
- 2 stepper drivers
- Standard servo x2
- Power supply

We thought the best way to pull the pen away from the paper when create the dots would be to use a servo motor. The image below shows an example of this. What is happening is fan edge on the steppr motor is turned to push the hanging pen away from the paper and turned back down when it is to go



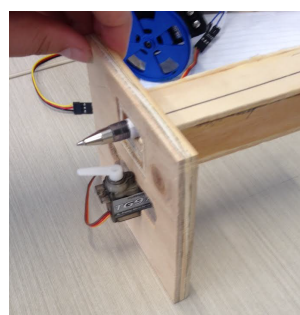
Heart rate pulse sensor

We have order a pulse sensor online. It is a plug and play heart rate sensor for arduino. It enables you to incorporate live heart rate data into our project. The kit comes with the material below.



Prototyping

We built a prototype of the pen holder. (Image on the right). In the process we came across a few problems. The stepper motor arm wasn't long enough to reach out the front of the wood block. For the prototype we had to have this attached to the front. Asthetically this looks silly. We will need to use a lighter and thiner wood block next time. The pen holder is also very long and heavy which causes the holder to tild backwards. We need to come up with a solution to hold the pen without the extra weight at the top. Maybe make it less bulky or have an extra piece of wire holding the end of the pen holder up.



Our next step

Initially our aim was to import data from our heart rate monitor and create a processing sketch to show how this works. Unfortunately our heart rate monitor watch we were going to use for testing ran out of batteris this week so we were unable to test this. Our next step would be to get the data in real time from the pulse sensor above and produce movement in the robot. We are curently waiting for more parts to arrive which we ordered online, thus we have not had the equipment to build more of our robot.