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https://github.com/20007213/final-project

Week 1

This week was the start of the first kind of project. I have always had a deep interest in psychological mechanisms. My initial idea is to make experimental devices related to sound and psychology. Maybe through machine learning or some sensors. And would like to combine audio and visual. Exploring the problem of sound visualisation.

Week 2

August 23, 2022

After a two-month holiday, in which I investigated some sound-related machine learning. To collate the research on GAN on acoustic models for speech synthesis, the application of GAN in speech synthesis is more in the vocoder part and very little research in the acoustic model part. The initial attempts I made, I found it more difficult for me to accomplish on the technical level and computer configuration.

Link: 1) TFGAN: A Lightweight Library for Generative Adversarial Networks (2017)

https://ai.googleblog.com/2017/12/tfgan-lightweight-library-for.html

2) A new gan-based end-to-end tts training algorithm (2019)

https://arxiv.org/pdf/1904.04775.pdf

3) A New End-to-End Long-Time Speech Synthesis System Based on Tacotron2 (2019)

https://sci-hub.se/https://doi.org/10.1145/3364908.3365292

Non-taoctron experiments

4) Statistical parametric speech synthesis incorporating generative adversarial networks (2018)

https://sci-hub.se/https://doi.org/10.1109/TASLP.2017.2761547

5) Wasserstein GAN and waveform loss-based acoustic model training for multi-speaker text-to-speech synthesis systems using a WaveNet vocoder (2018)

https://arxiv.org/pdf/1807.11679.pdf

Combining image processing pix2pixHD

6) Reducing over-smoothness in speech synthesis using Generative Adversarial Networks (2018)

https://arxiv.org/pdf/1810.10989.pdf

7) High-quality Speech Synthesis Using Super-resolution Mel-Spectrogram (2019)

https://arxiv.org/pdf/1912.01167.pdf

8) WGANSing: A Multi-Voice Singing Voice Synthesizer Based on the Wasserstein-GAN (2019)

https://arxiv.org/pdf/1903.10729.pdf

9) HiFiSinger: Towards High-Fidelity Neural Singing Voice Synthesis (2020)

https://arxiv.org/pdf/2009.0177

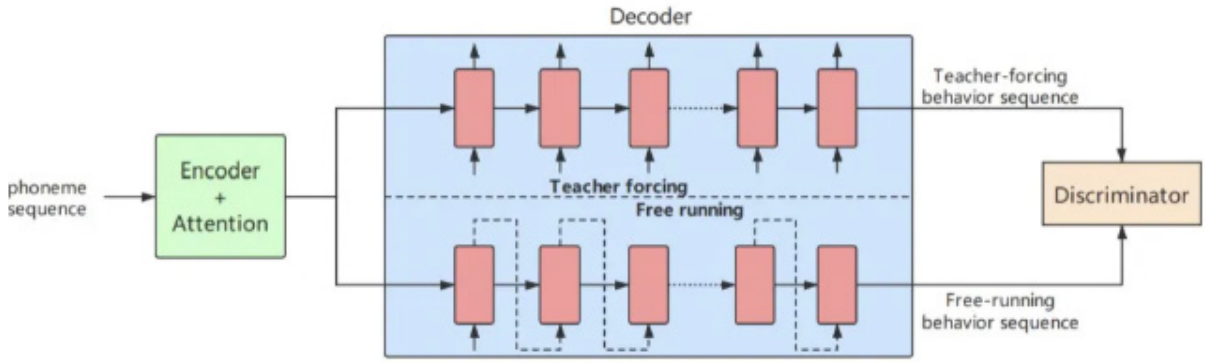


Figure 2: *The framework of GAN-based end-to-end TTS training algorithm*

Week 3

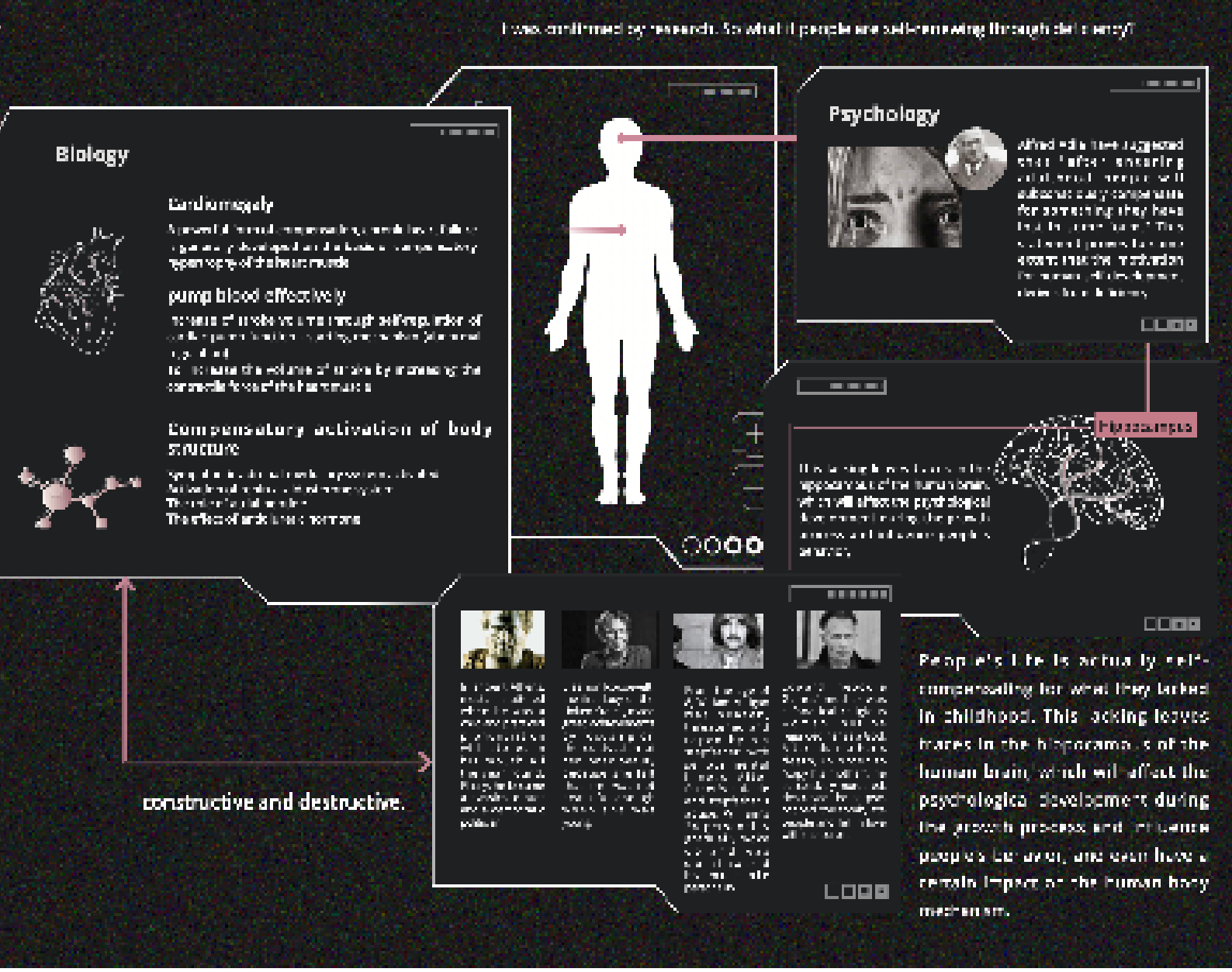
June 23, 2022

In addition to further research into machine learning, this week saw the launch of a survey of the theoretical literature. From the critical classification of psychological mechanisms, psychological defence mechanisms were the focus of research on the topic. I became very interested in this psychological mechanism while working as a high school teacher. This is because, as far as I have found, most children's family of origin directly influences their psychological state. The psychologist Adler said, "One spends one's life making up for the lack of childhood." I launched a literature study on this idea.

Week 4

This week I have focused my work on further research into psychological mechanisms. In Alfred Adler's psychology. Adler believed that everyone is born with some sense of inferiority (from the inferiority complex that comes from being a child and feeling that others are always taller and stronger than you) and that this inferiority complex creates a need for "striving for superiority". In order to satisfy this need for superiority, the individual seeks to overcome his or her deficiencies by means of 'compensation'. Adler argues that in order to understand human behaviour, two fundamental concepts must be grasped: inferiority complex and compensation.
Compensation is a type of self-defence mechanism, where a compensatory defence mechanism involves replacing one's defect with something else in order to alleviate the pain of the defect.
Sometimes this substitute is a fantasy, because the person is not satisfied in reality with a physical object, so he or she uses the fantasy to be satisfied in the imaginary world, and sometimes another object is used to compensate for the frustration he suffers from the defect. There are two types of defence mechanisms of this kind: fantasy and compensator.

Through my research I also discovered that in addition to the existence of psychological compensation mechanisms in the human consciousness . It is also present in other organisms and in the human organism. This inspired me if today, when the renewal of man-made objects is intensive. If inanimate artefacts have a self-compensatory mechanism. If inanimate creatures have a self-compensating mechanism and engage in compensatory behaviour. What would happen then.



This week I stopped by to do a little visualization exercise with the research content :)

Week 5

This week through further study of machine learning. I found that the principles of machine learning are similar to the concept that man-made objects can have human consciousness. Firstly, artificial neural networks for machine learning work by simulating the nervous system of living things, especially the human brain, for computing. Artificial neural networks act as an "alternative artefact". At this stage, they can only be described as simulating the human brain, not actually possessing it. But this principle and concept is highly relevant to the topic I want to investigate further. This week I generated and processed a dataset of virtual portraits using DCGAN, a neural network. And will be applied in subsequent work.

In [ ]:
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train(train_dataset, EPOCHS)
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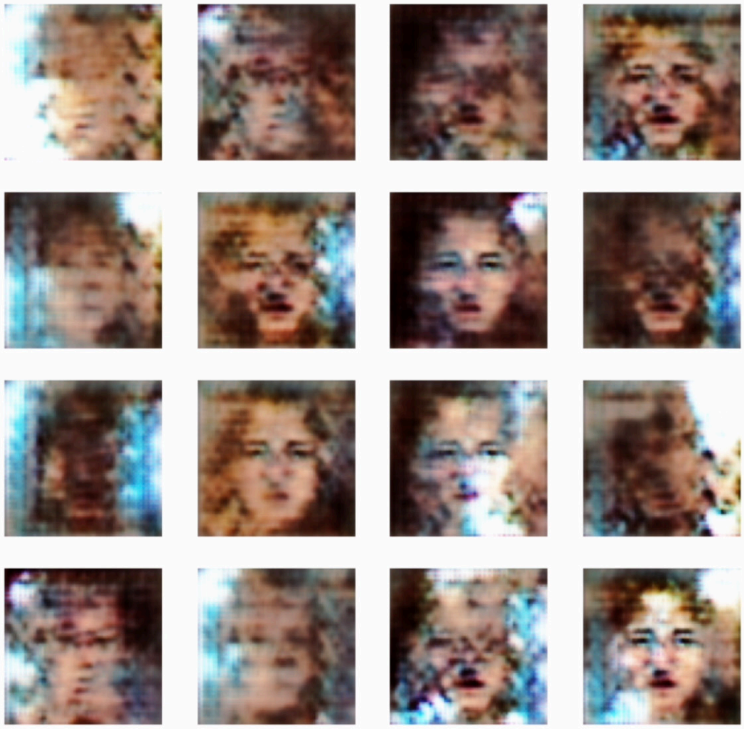

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Time for epoch 409 is 11.66037654876709 sec
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Week 6

A more detailed preliminary plan for my project this week.and put together a proposal. and sent it to Hadeel.

Idea

Human society is changing everyday. Updates of man-made objects speed up such procedures. People keeps endowing man-made objects more humanized features, sometimes scientists even want to make man-made objects conscious to better service human beings. However, if man-made objects have self- consciousness and able to control their behaviors, could they grow up according with human being's requirements? Can it avoid the miserable fate of being abandoned? Or, is it possible that they finally become new type of "garbage" after losing themselves?

Questions

Hypothetically endow man-made objects with self-compensatory awareness. How do man-made object transform and interact with humans?

Research

Finding artefactual vehicles that resonate with the public (questionnaire research)

After my questionnaire survey, I found that mobile phones resonate very well with the general public, and in the current social life, human beings cannot live without them. Moreover, mobile phones are being updated very quickly, so I intend to use them as a vehicle for artificial objects to create.

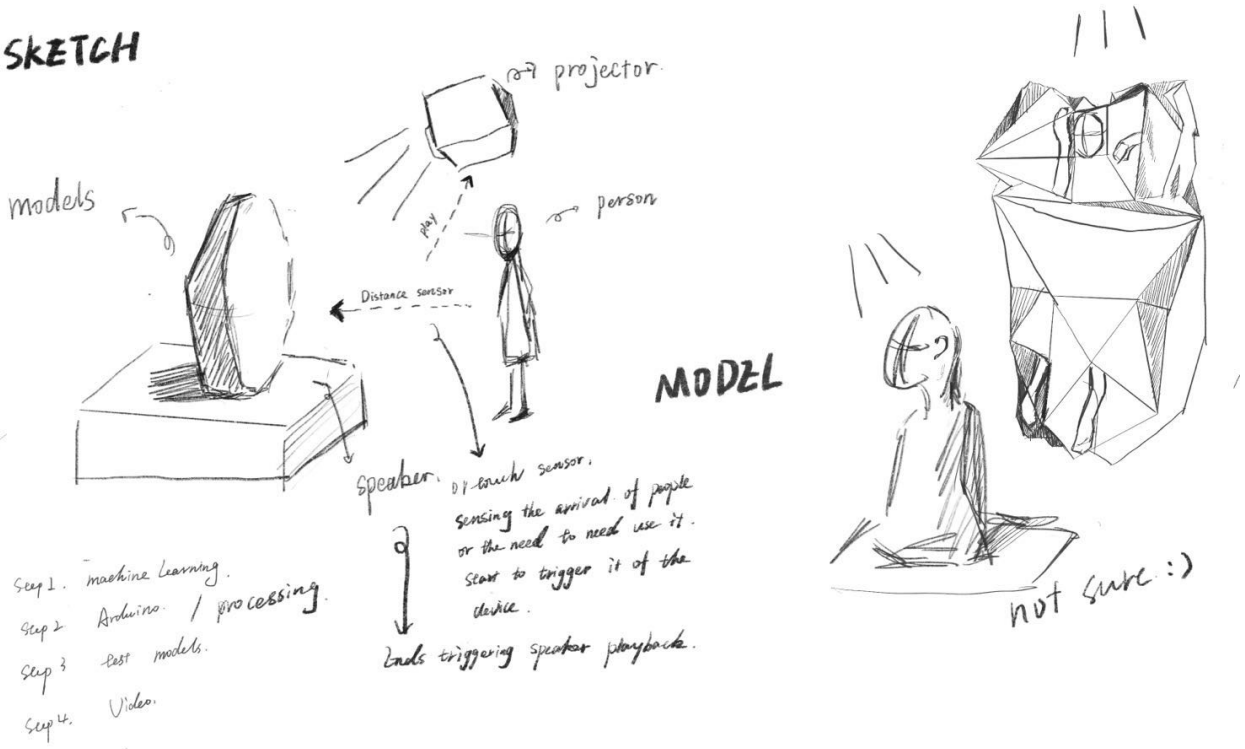
Method

machine learning
Arduino processing
Projection
Clay models （I am not sure

step

First, I tried to make a video using machine learning to simulate the process of Compensatory mechanism for man-made projects. (DCGAN & Fast Style Transfer for Arbitrary Style) （I finished ）

code: https://colab.research.google.com/gist/20007213/d0765594cdac094f3c85b2787194f9a1/-final-work-111-ipynb.ipynb#scrollTo=P4M_vIbUi7c0



I envisage designing a model of a man-made object as a vehicle. I will use projection to project the video and allow the audience to interact with it. I will try to edit the video using processing and then interact with the human through sensors.

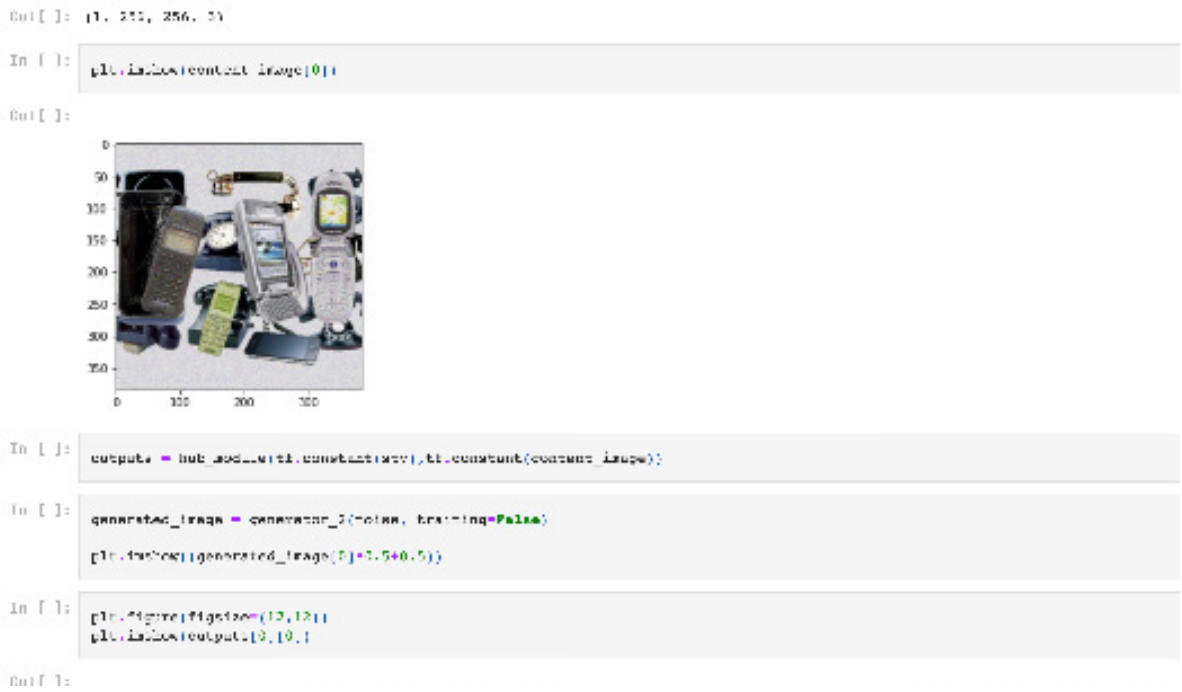
The sensor I had in mind at first was the distance sensor. Sensing the proximity of a person and triggering the video to play. As well as sensing the proximity of a person triggering a change in video form.

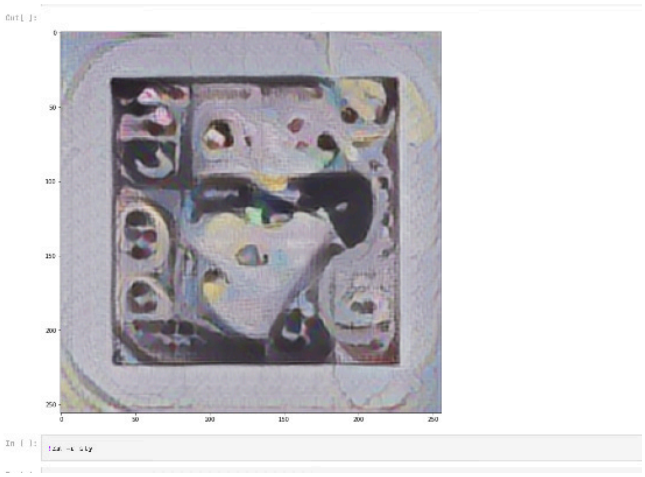
Later, I thought a heart rate sensor might be more appropriate? The artefact senses the human's state needs to produce some change.
Here, I am still experimenting with the technical implementation. Am watching tutorials on this to use processing and Arduino. May I know of a better way to tell me?

This is what I have thought and tried so far. I'm not really sure it's possible. If you have comments and suggestions. Could you get back to me? Thank you very, very much. Again, apologies and regrets for not being able to meet last Friday. I look forward to hearing from you.

Week 6

After confirming the topic with the tutor. I further advance my work. This week I mainly used the results of the research I got.
Popular resonance - highest man-made object - mobile phone. In-depth research and completion of the first part of the technical work. To give the concept of machine learning to the act of compensating for man-made objects. Using the process of machine learning. Simulating the self-compensating behaviour of an artefact.
On the other hand, the exploration of interaction methods. Experimenting with Leap motion and distance sensors this week. The exact choice will have to be investigated again.

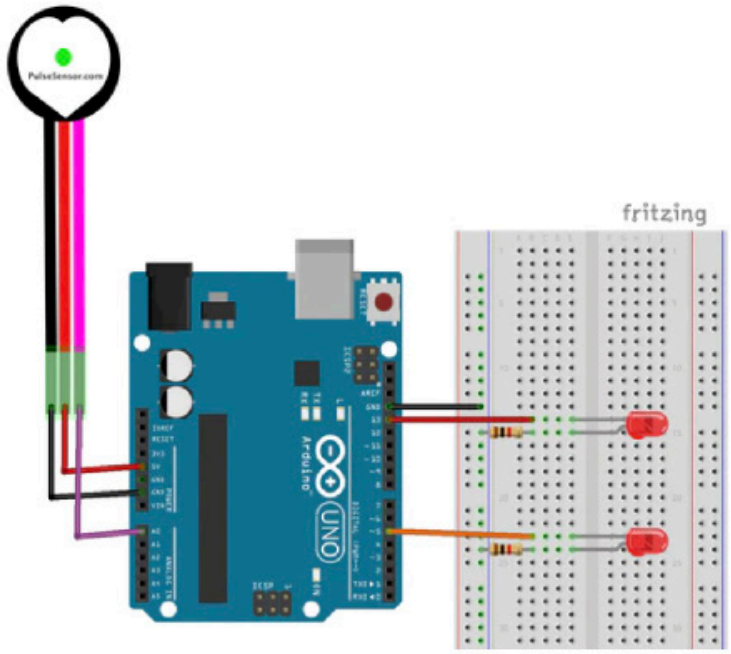




Week 7

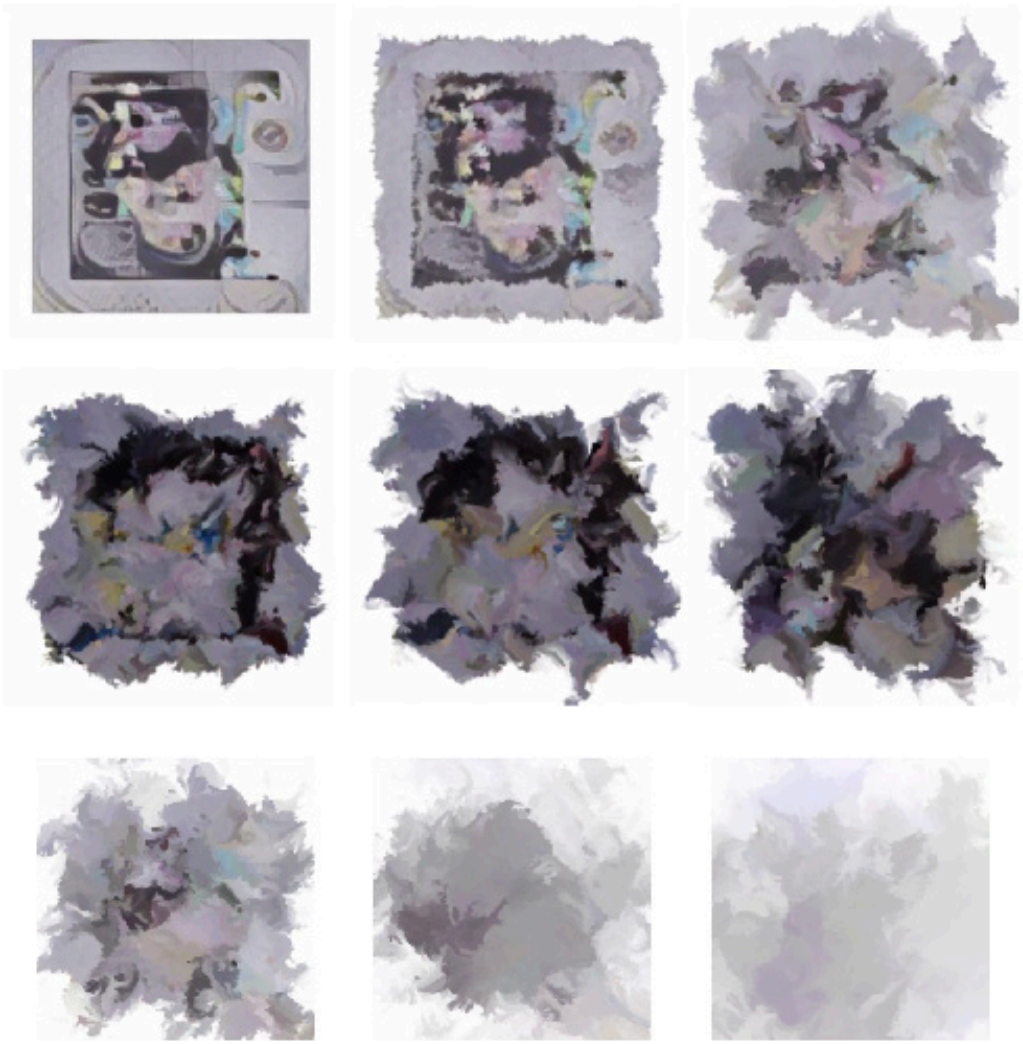
This week it was inferred through research that the vicarious behaviour of artefacts should not be directly influenced by people. So eliminate the choice of obvious physical interaction. Confirm the use of a heart rate sensor for the trial. In this week the sensor is working for use. The next thing to think about is its interaction pathway.

https://pulsesensor.com/pages/getting-advanced



Week 7

First I tried using processing, but it didn't work very well. This week I have been working on the use of processing and touch designer.



Week 8

After many previous failed attempts to generate music with machine learning. This week I found a model that could be trained without any problems. (WAVEGAN) The step was to visualise the sound of the device. The machine learning generated sounds simulate the compensatory behaviour of the artificial object, acting as "beating neurons" to illustrate the changes in the "body mechanisms" that occur when the artefact performs its compensatory behaviour.

Week 8

In week nine I put together the work that I had done. and the final analysis tests.
On completion I will get an audience for testing. The test results will then be used to develop plans for future iterations.