

“Bruno”
By Matt Jones
33724432

Automated anxiety.
<https://vimeo.com/782266795>



Introduction

Anthropomorphism is the act of attributing human characteristics to non-human objects or items. This project aims to explore this concept and if a non-human item can be seen to "feel" a human emotion, from the point of view of human observers.

"Bruno" is a non-human device that suffers from social anxiety. When left alone he is calm, but if someone approaches him, he gets stressed and panics until he is alone again.

Background Research

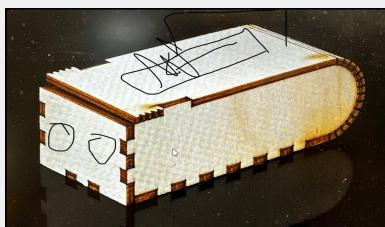
One of the early creative inspirations for Bruno is the project "Happy Cow" by Ece Tan, which recontextualised farming tools as sex toys to provoke and inspire empathy in farm animals. With this project, I hoped to examine how empathy is assigned and how this empathy can, with anthropomorphising, grant human emotions to non-human items.

Concept

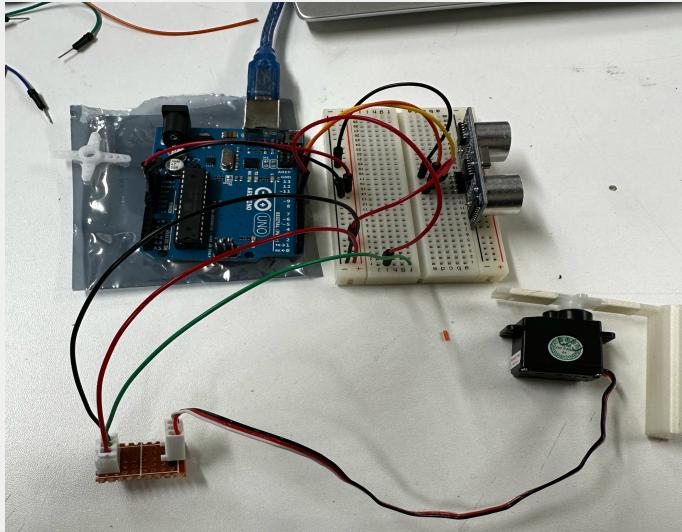
The initial concept for the project was based on a lie detector, or heart rate monitor, that would show a quickening of the pulse, or an increase in stress, as it is approached. The original idea for this design was that it would be a reversal of the standard usage of these items - to display the stress of a user.

The idea then moved away from this concept, and more towards developing the idea of anthropomorphism, and was redesigned into a less recognisable shape, to avoid any pre-existing views about the item itself.

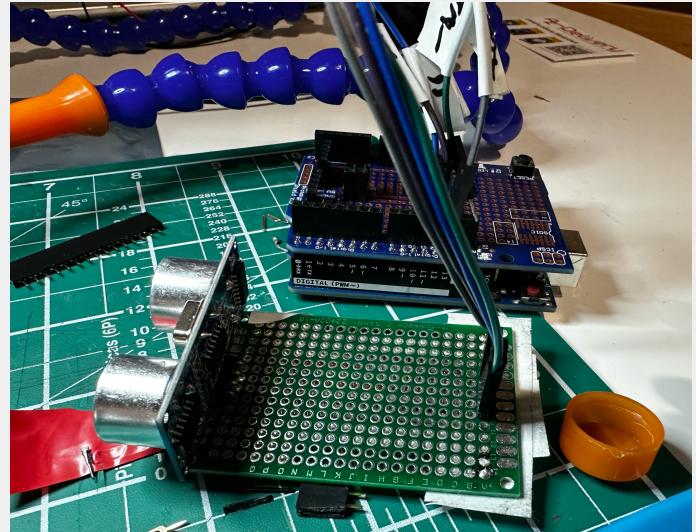
The new design was inspired by deep sea fishes, and would be totally transparent and showing the internals of the project. To this end I planned that all of the non-electrical internal parts were going to be printed in white, to be evocative of an animal's skeleton.



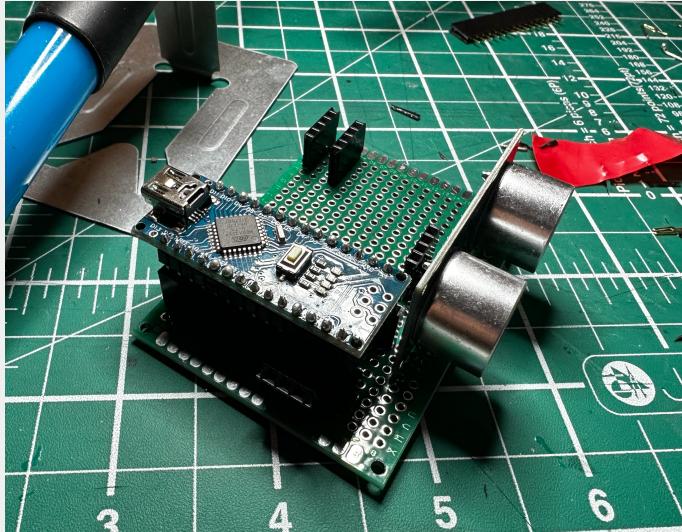
Technical Implementation



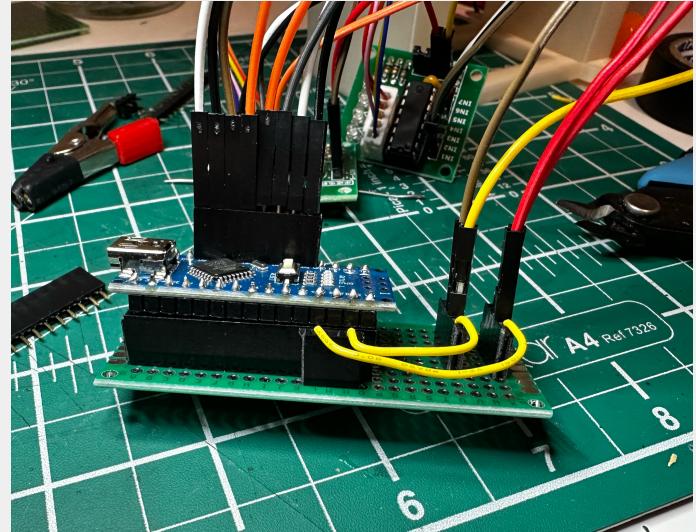
Sensor First iteration of the distance sensor - on breadboard - with servo to test.



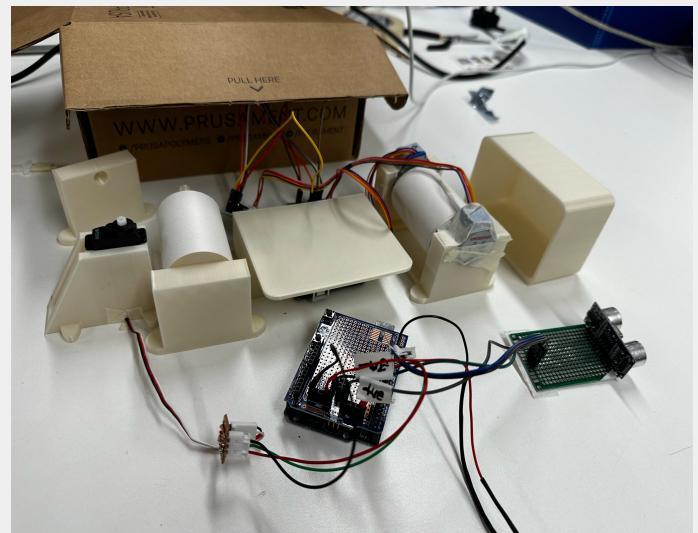
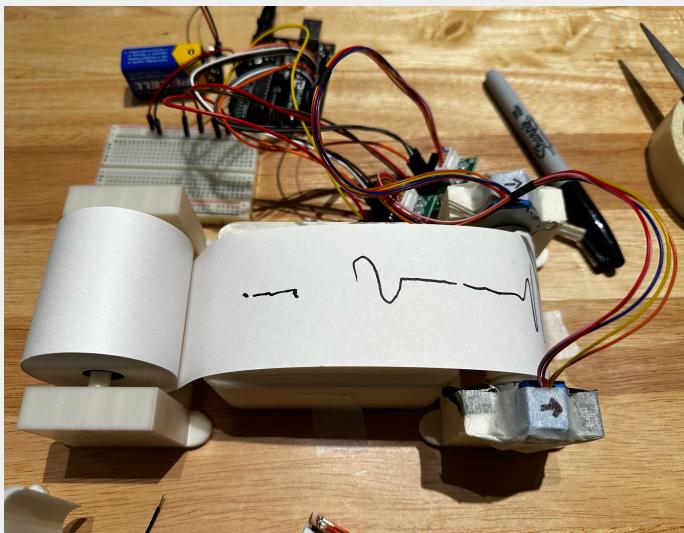
Sensor Second iteration: The project was then moved off of the breadboard and onto a soldered perfboard and prototyping shield.



Sensor Third iteration: due to space constraints within the project, I switched from Arduino Uno to Arduino Nano, this allowed me to solder a complete system on a single perfboard.

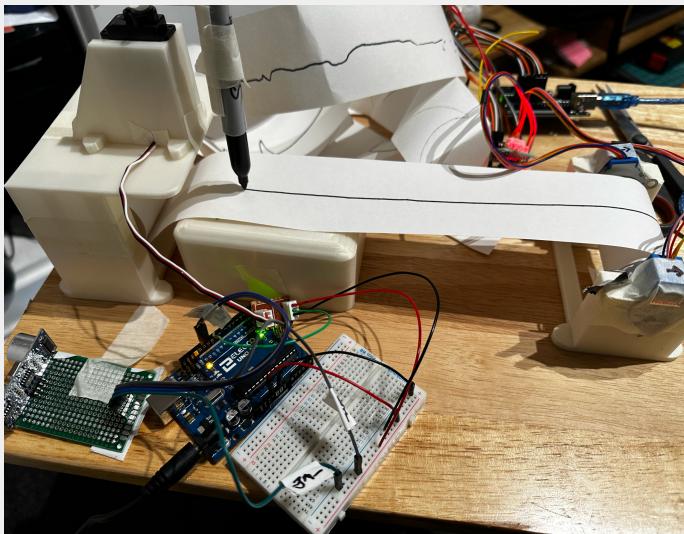


I added a second Arduino Nano to control the Stepper Motors that drew the paper through the system - this was to avoid any interference between the two systems in the code.



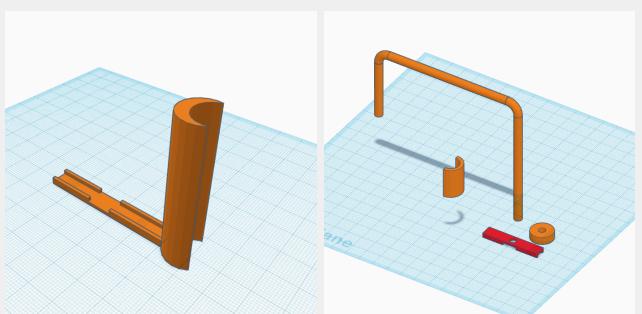
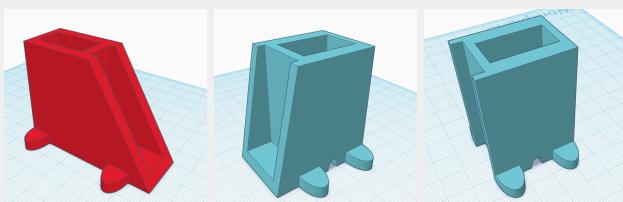
Paper Feed first iteration: Initial prototype using breadboard and Stepper Motors to test.

Paper Feed second iteration: moved from breadboard to prototype shield. Internal components were printed in white PLA to evoke the look of an animals skeleton.

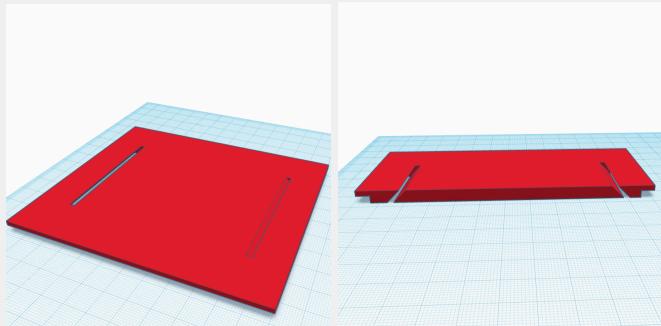


First test of the full system. Two independent Arduino Uno's working together to produce the final result. Paper roll holder and pen holder changed in later revisions to better fit space available in the finished case.

Case first iteration: Card prototype of project case, based on the look of a deep sea Barrelleye Fish. Spaces cut to correspond with where items will go or where inlay plates (to be printed) will fit.



Development of Stepper holder (L-R Prototype, First Iteration, Final Item). Originally designed to look like a skeletal "Tail" it was later modified to fit the space available in the final product. Notch added in base for Stepper motor cable.



Writing plate design (with section drawing), slits at 45° angles to aid the drawing and pulling the paper into the roller.

Development of Pen Holder (L-R Original Prototype, Finished product). The original design was for the pen holder to sit outside the shell, but this was later changed to an internal holder with a large extended arm, reminiscent of a dorsal fin.



Finished Product.

Reflection and Future Development

As a realisation of the idea i had for this project, i believe that it was very successful. During the production of this item I was required to learn a number of technical skills, including 3D modeling, which came together to produce a complete product. There were a number of areas for improvement I identified that I believe I could perfect in future versions.

Firstly, the pen holder could be redesigned to incorporate a means to raise and lower the pen when not in use - this would stop the pen soaking into the paper as it waited for input. Additionally, in its current state, it is very difficult to remove the used paper, and impossible to change the unused paper roll. A second iteration of this project would definitely focus on the reusability of the project. Secondly, whilst demonstrating the project, I discovered that after prolonged use, the buildup of paper causes the stepper motors to begin to jam, a large part of this is caused by the motors running constantly when the device is in operation. In a future version of this project I would include a means for the Stepper motors to only turn on when it detects someone nearby, before the Pen Servo is activated. This would avoid the jamming paper. Also - as above - if i included a means to remove the used paper, it would prolong the devices running time.

References

Stepper Motor Tutorial

<https://create.arduino.cc/projecthub/debanshudas23/getting-started-with-stepper-motor-28byj-48-3de8c9>

HCSR04 Code Library & Example

<https://ecetan.com/happycow>

Happy Cow - Ece Tan

<https://www.alexanderjamestarvet.com/blog/2014/11/9/anthropomorphism-and-thomas-was-alone>

Anthropomorphism and Thomas Was Alone - Alexander Tarvet

Video Sound Assets

<https://sound-effects.bbcrewind.co.uk/> - "Southern & Western Region Goods Trains", BBC Sound Effects

<https://www.bensound.com/> - "Sad Day", Ben Sound

Parts List

2x Arduino Nano

1x 200Ohm Resistor

1x LED (Red)

1x HC-SR04 Ultrasonic Distance Sensor

2x 5V 4-Phase Stepper Motor ULN2003

1x SG90-HV Servo Motor

1x 5V Breadboard Power Supply

