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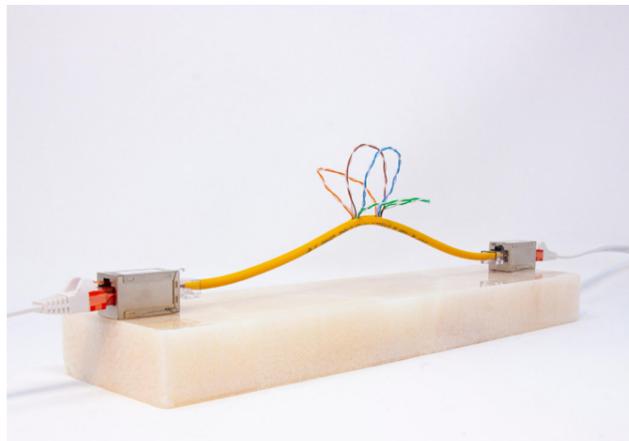
Design Domain Materiality | Research

Evan Roth

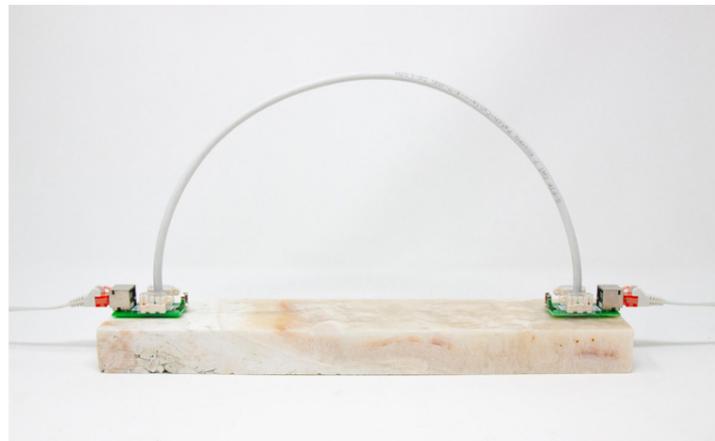
Bent Network

2020 - Ongoing

Inspiration from Evan Roth's work, looking at how data and communication systems can be visualised and physically manipulated.



Yellow Breakout Loops - 2020



White Arch - 2020

Paul DeMarinis

The Messenger

1998 - 2001

Inspiration from Paul DeMarinis, who was a media artist exploring how communication systems can break down. The Messenger (1998–2001), is a system of communication made up of abstract links: tin bowls, dancing skeletons and even pickled letters.



The Messenger - 1998 - 2001

These works showed me how data itself and the medium through which it moves and exists are separate materials that are in-fact intrinsically linked. This means that the integrity of data depends entirely on the fragility of the medium that carries it.



The Messenger - 1998 - 2001

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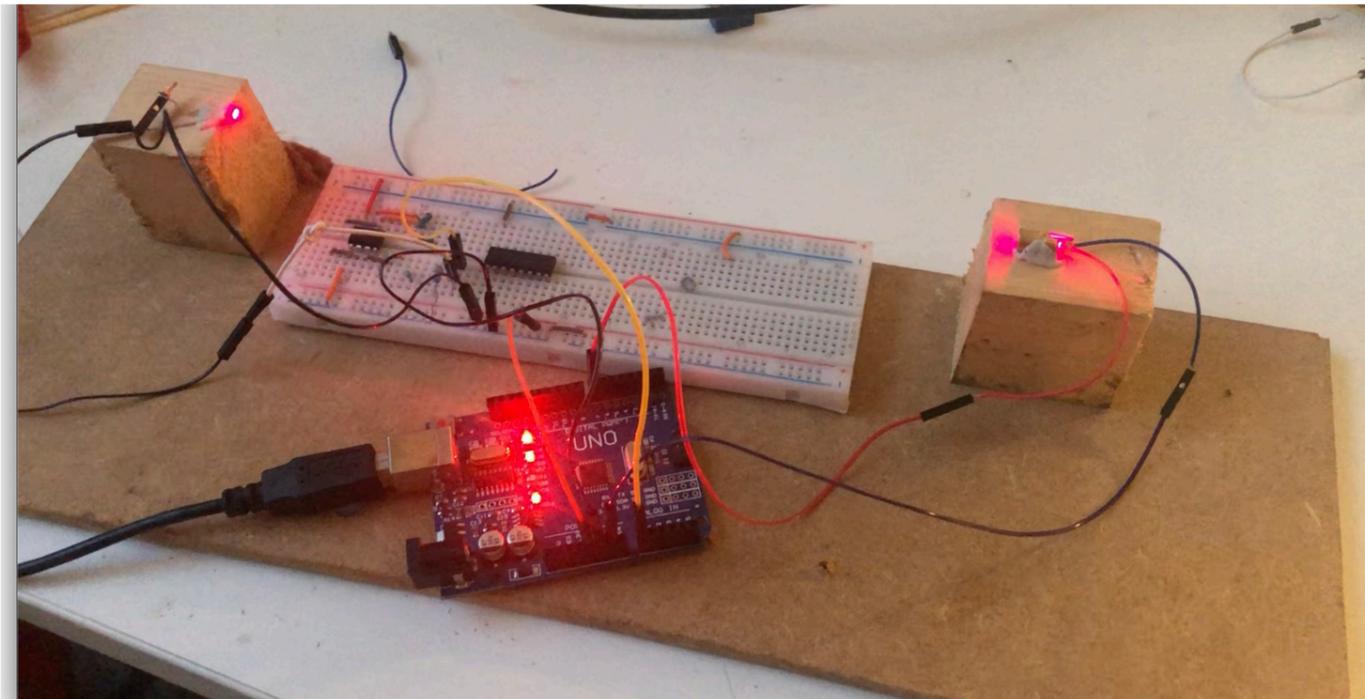
Design Domain Materiality | Exploration

Abstract Data transfer methods

Laser Diode, LDR, Arduino.

Experiments sending binary data through the air with a laser diode, received by an LDR.

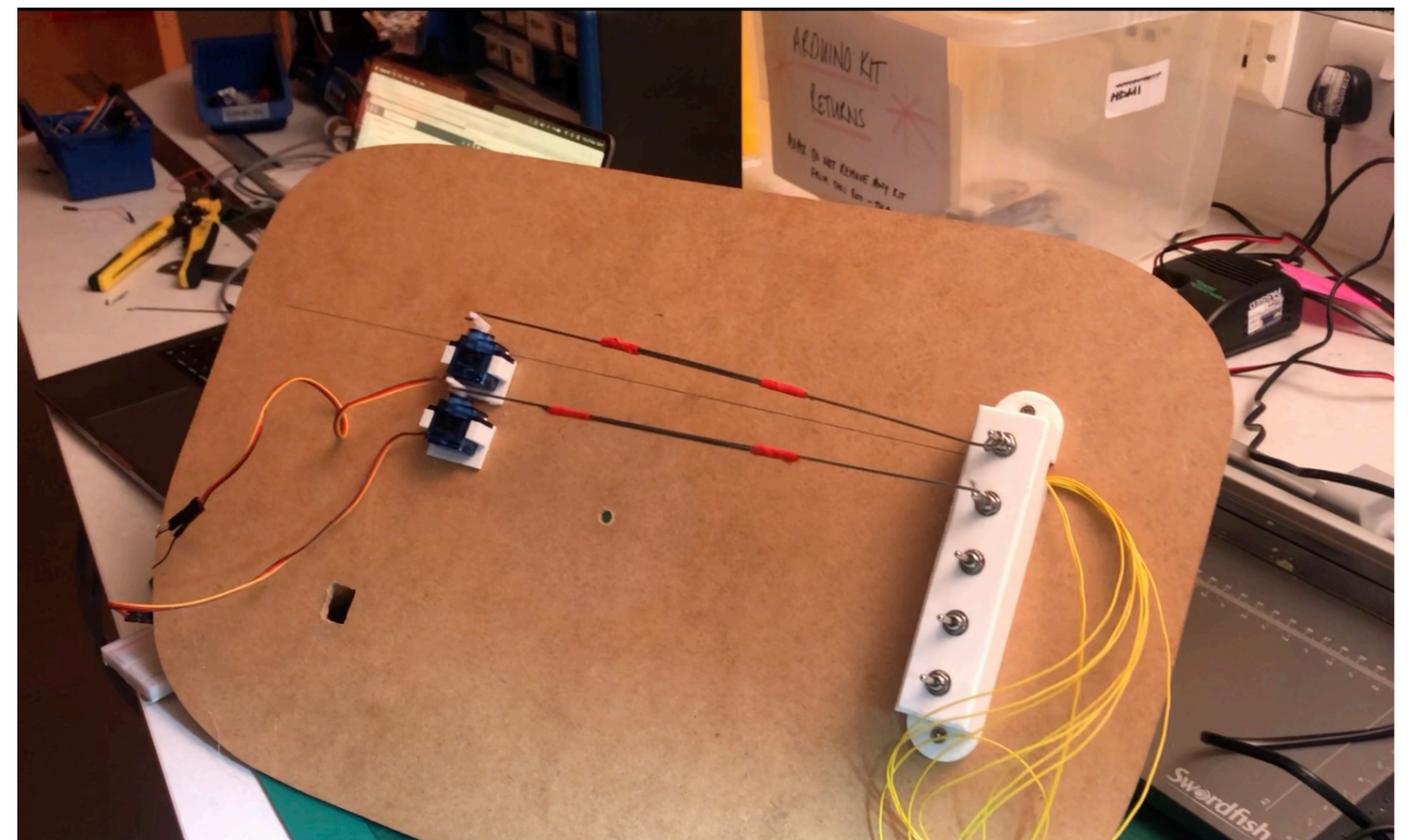
Data encoded and decoded by processing, serialised to Arduino for Transmission. The air gap here allows the data stream to be physically interrupted flipping bits, 1s into 0s.



Servos, Toggle switches, Arduino

Here the encoded data is being sent to an Arduino controlling two servos. These act just like the laser, to send either a 1 or a 0; however, in this case the receiving circuitry here is two toggle switches. They are 2-state switches, each state representing either a 1 or 0.

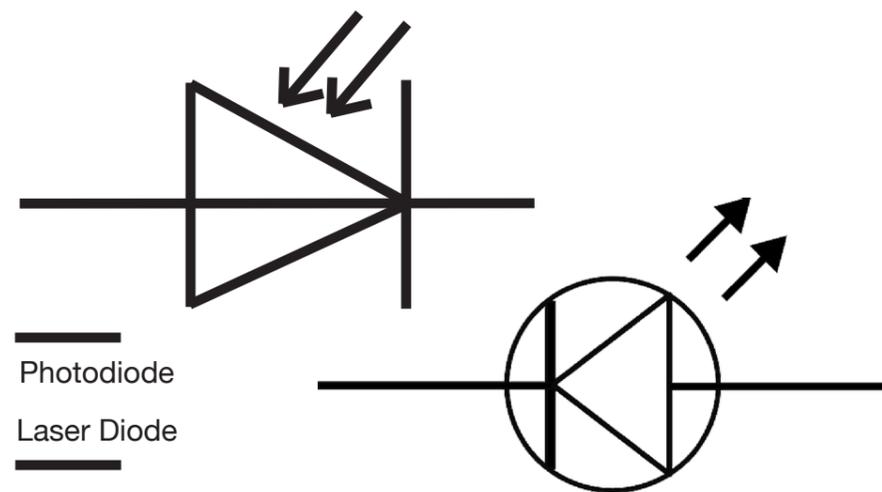
A much slower system; however, where it lacks speed it makes up in the tactile nature. It creates a much more visual representation of the data flow. But most importantly, there is no opportunity for the data to become corrupted or interrupted.



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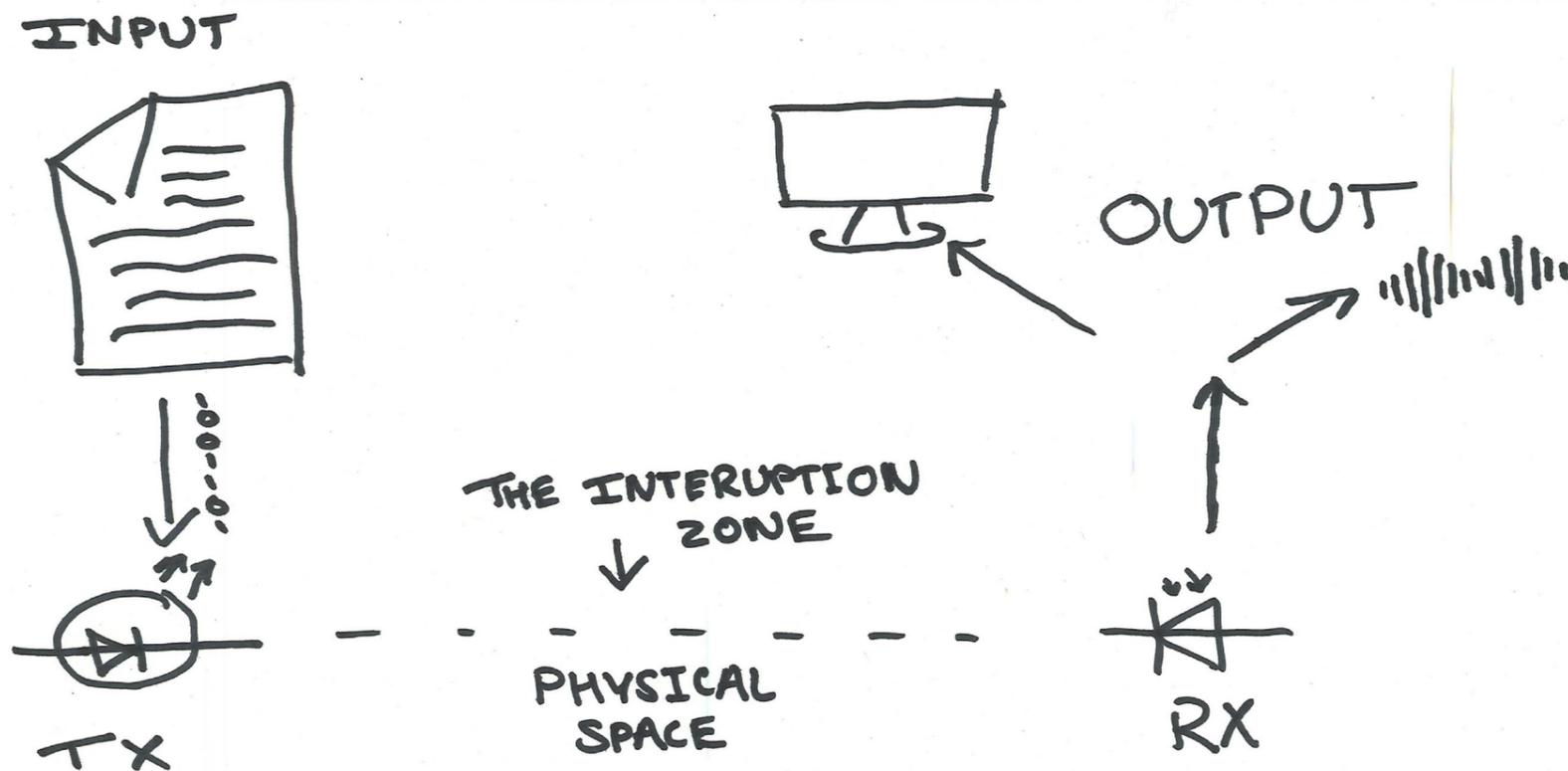
Design Domain Materiality | Exploration

Developing light based transmission



In order to make any meaningful communication system we need to move data at speed.
 This project by no means is trying to create “fast” data transmission, but we also do not want to be waiting for nearly 2 years for a bit map image for example moving at 1 bit per seconds.
 This means two things, ensuring maximum efficiency from components used. And ensuring thought is being put into the format of the data we are transferring.
 The former is purely technical however the latter encompasses the entire conceptual aspect of the work.

The concept - (s)



The work aims to tackle the theme of materiality by laying bare the physical means of data and digital communication systems. What I have dubbed the “interruption zone” is the space where the digital data — the intangible material — becomes realised as a genuine physical material, while still being somewhat invisible. Within a gallery setting points “TX” and “RX” are separated by space that people can occupy, and thus interrupt the signal therefore, manipulating the output.

The core technical elements of the work can then be applied to a multitudes of data types, from bit map images, to text and even sound by amplifying the intensity of the light with modulations in the sound - much like an AM radio Transmitter.

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1111001 100000 1111100 100000 1010010 1100101
1110011 1100101 1100001 1110010 1100011 1101000

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Design Domain Materiality | Development

Concluding exploration | Further Development

To conclude the exploration, the most effective output needs to be determined, which of course determines the data type that will be used.

Since the work occupies a large area in space, audio is the most immersive format. Using the aforementioned technique of Amplitude Modulation, we can transmit sound across the space, and with the built-in DAC/ADC of a Raspberry Pi, we can use such a device to do so.

Since this uses more powerful processors than an Arduino microcontroller, it allows us to do things such as audio buffering, meaning that instead of stopping the audio immediately when the transmission is interrupted, we can manipulate it, delay the interruption, etc.

In order to create a more immersive piece of work, the RX and TX "systems" shouldn't just be aligned. By using mirrors, the transmission can be bounced around the space, creating a larger, more dynamic "interruption zone." This combines perfectly with the atmosphere created by the audio.

