HEMAL DIAS

design portfolio
may 2021

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stablspoon

stablspoon is an award-winning stabilising spoon for people with hand tremors. The project is currently sponsored by both the Design Council and Alzheimer's Society, with an anticipated release date of early 2022.

When the handle of this spoon is shaken, the bowl remains still. Unlike competitor products which use complex electronic systems, stablspoon is fully mechanical allowing it to cost under £50 rather than over £200.

Our end users also complained about the embarrassment associated with using conventional bulky and white eating aids, leading us to develop an aesthetically pleasing product that people want, not just need.

More information at stablspoon.com.

Awards:

Design Council Spark Award *Winner* (2019)

Engineering Talent Awards 'Best Innovation of the Year' *Shortlist* (2020)

Design Intelligence Awards *Honourable Mention* (2020)

viyu

Final outcome

viyu aims to make air pollution awareness viral by letting people collect and engagingly share their own hyper localised data.

It consists of an open-source, affordable and portable air pollution sensor which constantly monitors the concentration of air pollutants and syncs this data with an app. Its low cost nature allows as many people as possible to own it, resulting in detailed localised evidence about air pollution. To make it even more accessible, we developed a DIY kit (shown overleaf).

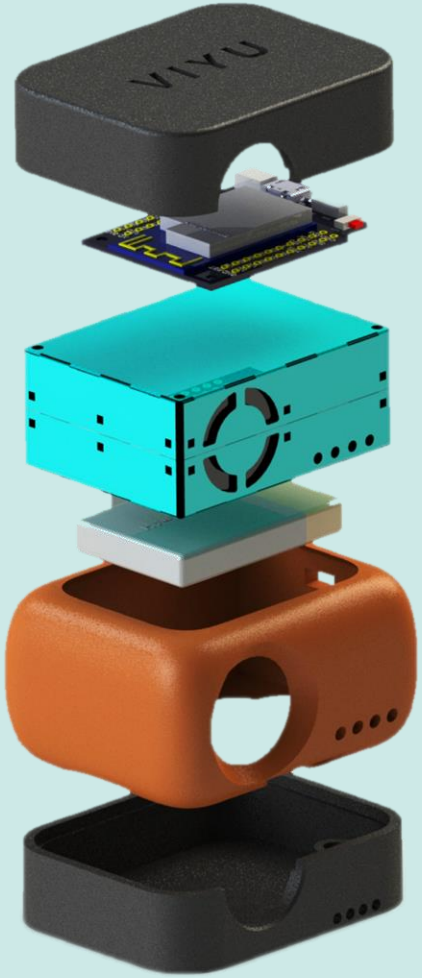
The app uses 3D graphics and sounds to visualise air pollution, making the data easier to understand and compelling to share on social media.

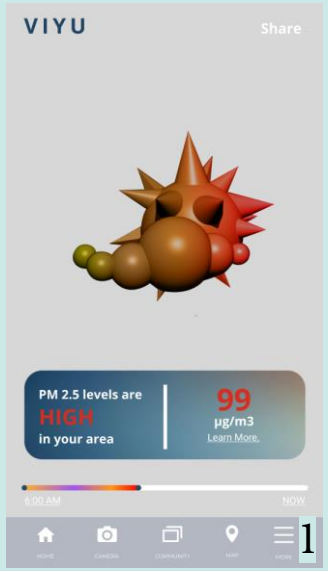
The project was developed for Delhi but has the potential for a global impact.

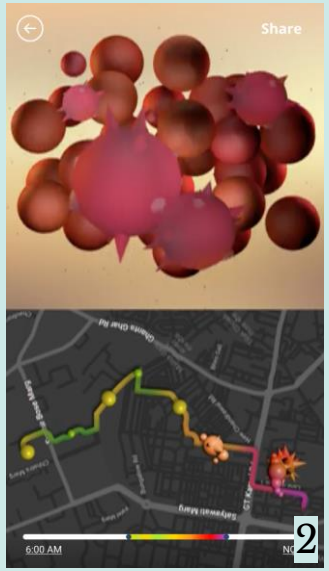
Group project.

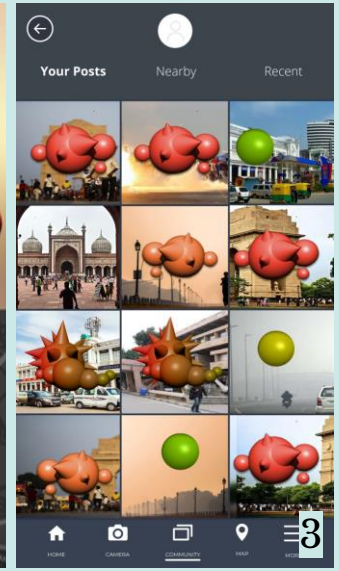
Awards:

Royal College of Art Grand Challenge Finalist (2020)









1) Realtime localised air quality data with 3D visuals.

2) Tracking air pollution exposure by time and location.

3) AR functionality to overlay air pollution graphics over pictures.

4) viyu air pollution sensor.

viyu

Development Process

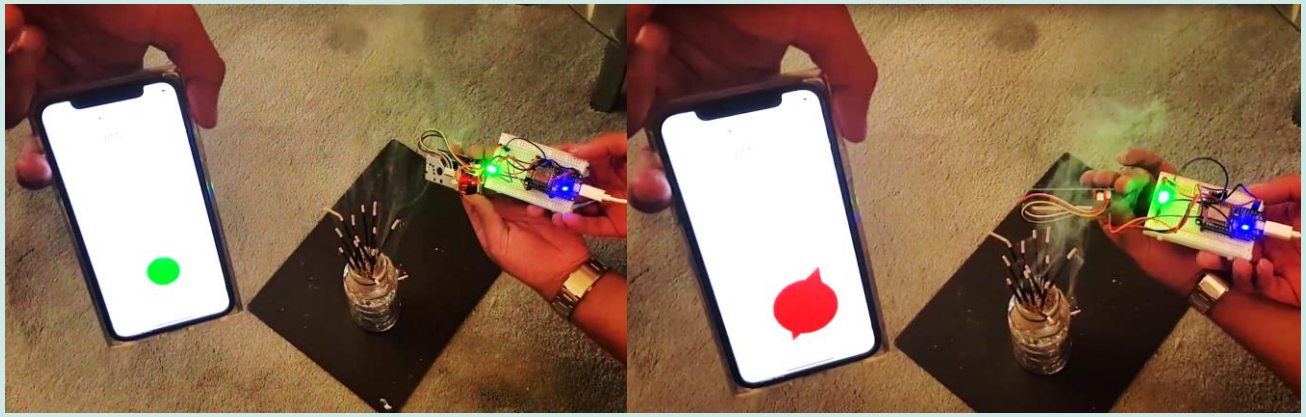
Air pollution causes 4.2 million premature deaths annually[1]. In 2017, **1.24 million of those deaths happened in India[2]**.

Our research involved contacting air pollution charities in Delhi. We learnt that the root of the problem was the lack of air pollution data being gathered. The limited data that was collected was represented as an Air Quality Index (AQI) number which people did not understand. Furthermore, people did not know about the health consequences associated. With this in mind, our solution had to do the following:

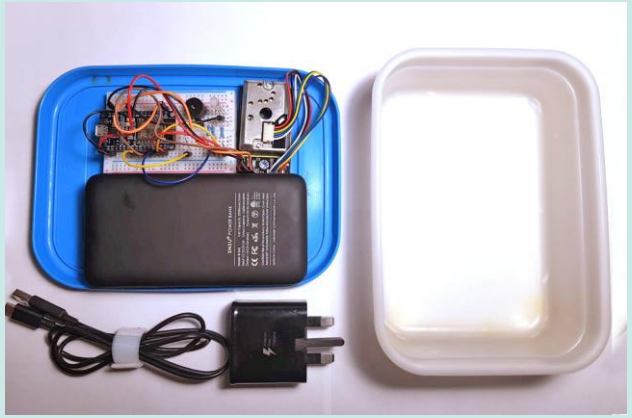
1. Democratise localised air pollution information.
2. Enhance understanding of air pollution information.
3. Raise awareness about air pollution and its impact on health.

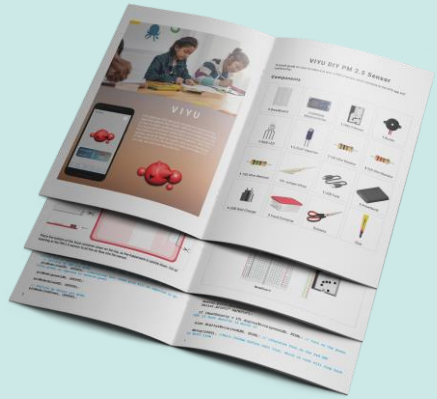
[1] World Health Organisation

[2] 2018, Lancet Planetary Health



Functional prototype and app. Incense sticks produce the pollutant PM2.5 causing the viyu sensor to react with an unpleasant shape.





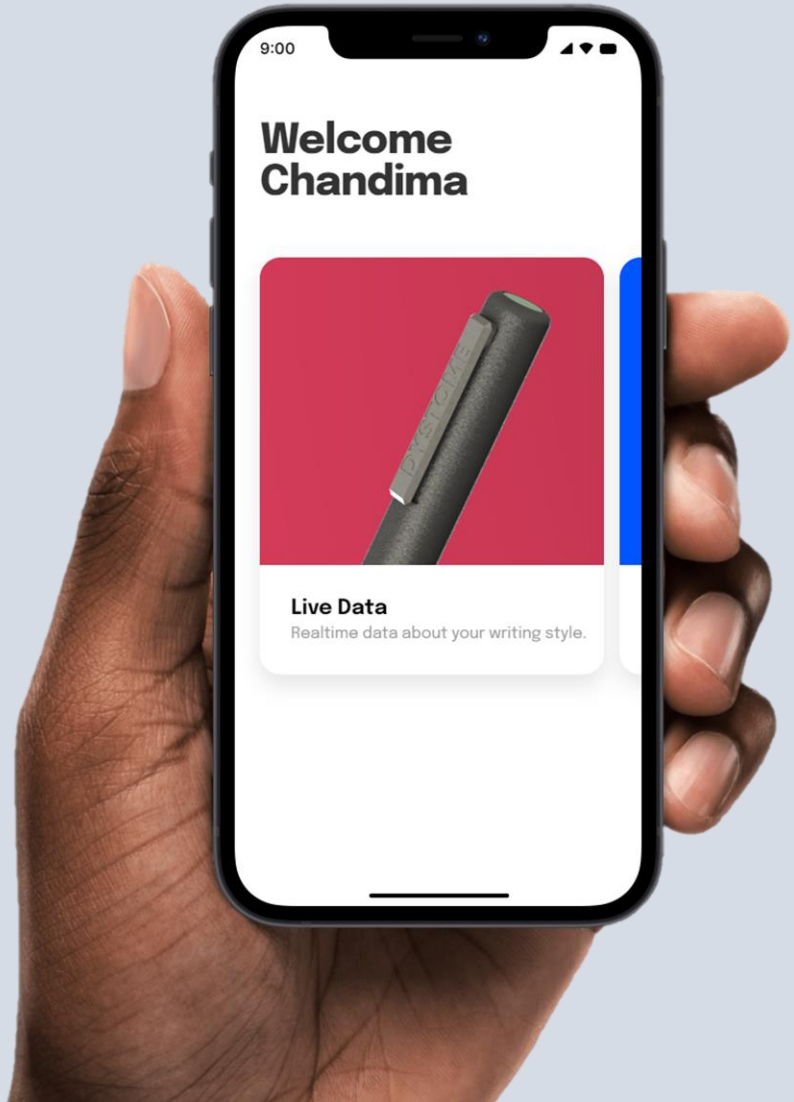
Our £5 DIY sensor kit alongside a manual on how to assemble.

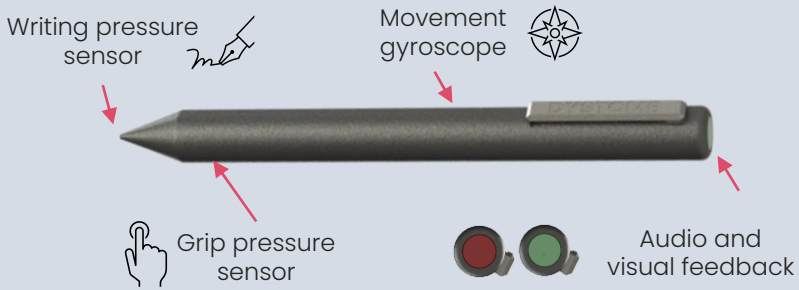
dystome

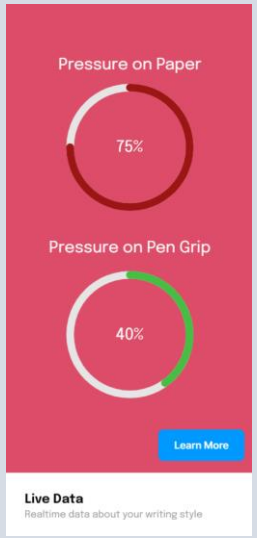
Final outcome

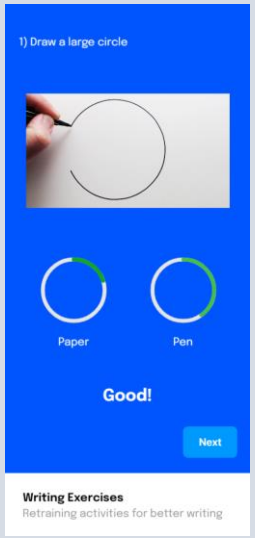
Focal Hand Dystonia (FHD) causes painful muscle spasms in the hand when doing only one certain activity which is typically **writing**. This makes handwriting slow, illegible and agonising.

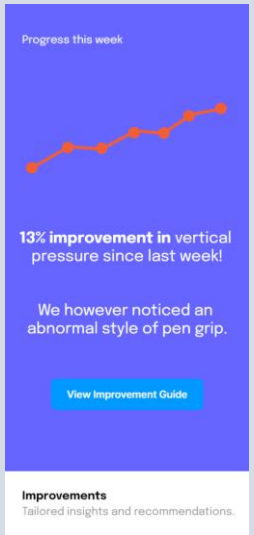
dystome is a specialised pen that helps people relearn how to write by monitoring key handwriting characteristics and delivering tailored recommendations.











dystome

Development Process

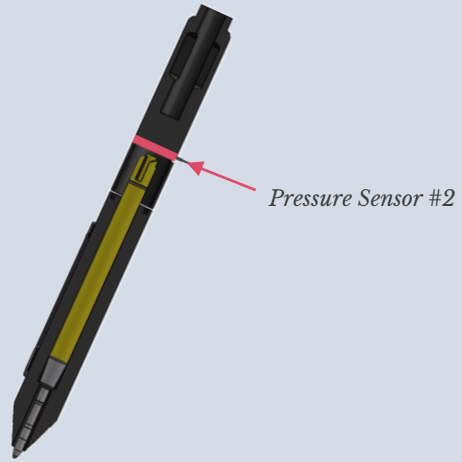
15 in every 100,000 people suffer from Focal Hand Dystonia (FHD)[1]. It is a neurological condition with a significant professional, social and emotional impact.

The physical problem is that people with FHD involuntarily apply too much pressure to the pen they hold. The current primary solution is Botox injections to weaken the muscles in the hand, but this has serious side effects and is only temporary.

Retraining is an alternative treatment, where the person is retaught how to write. This has not gained popularity as it requires a specialist physiotherapist to constantly monitor handwriting exercises. dystome allows physiotherapists to prescribe home exercises with confidence, knowing that the pen will ensure correct motor action learning.

[1] Amouzandeh, 2017

Functional prototype and app. The pen features a pressure sensor measuring how hard you grip the pen and another measuring how hard you write on paper.



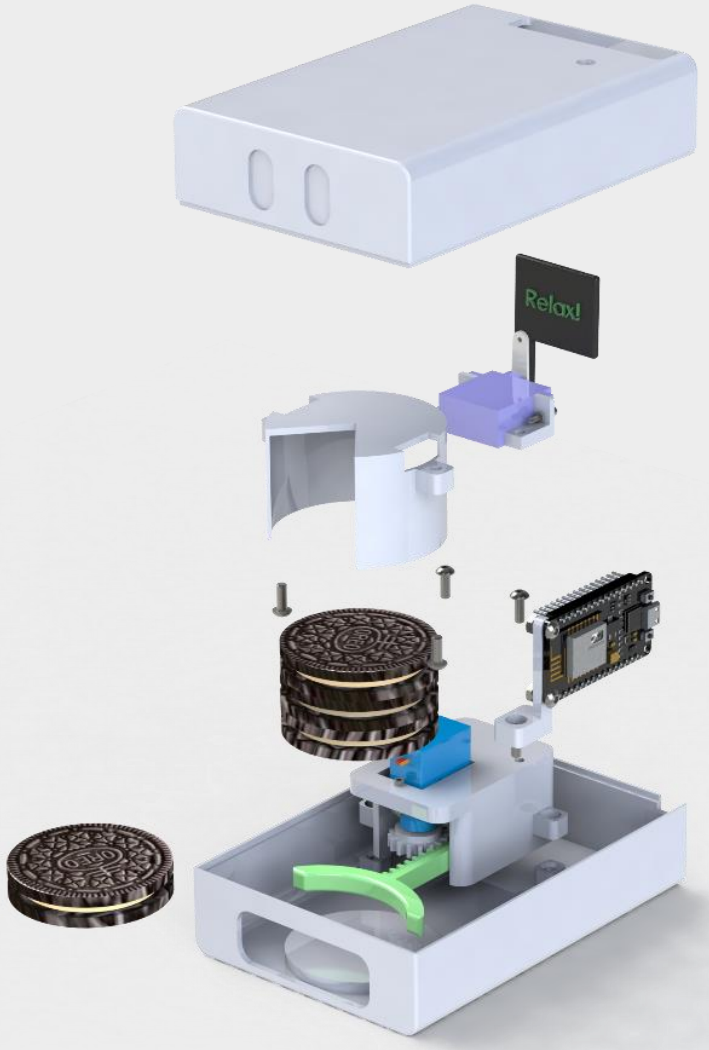
relax!

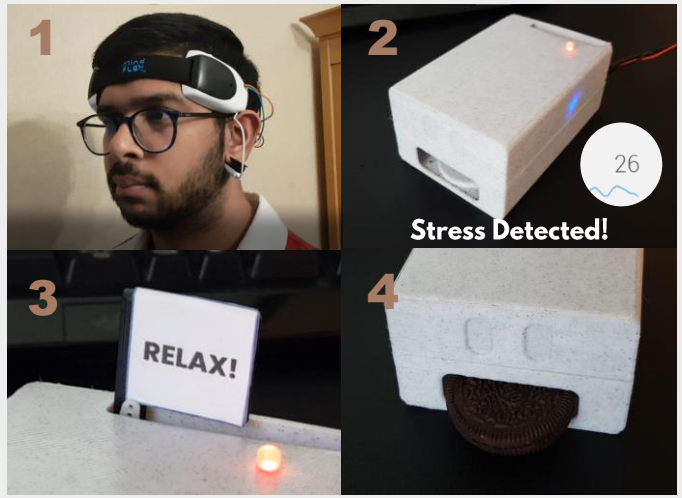
What if the computers surrounding us know **how we really feel?**

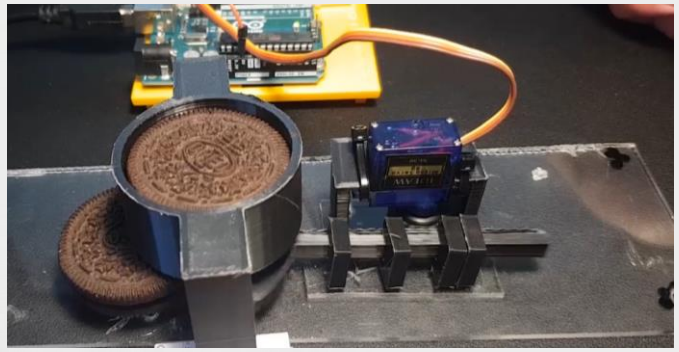
relax! explores this concept by utilising a hacked EEG sensor headset to wirelessly monitor and transmit data regarding your stress and attention levels, rendering your mind as an IoT device.

The base station knows when you're stressed, causing the relax flag to rise and an Oreo to be 'printed', encouraging you to take a break.

Demonstration video







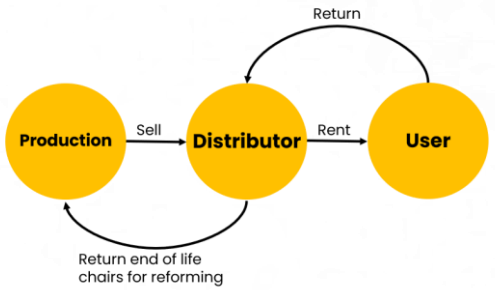
Early mechanism prototype

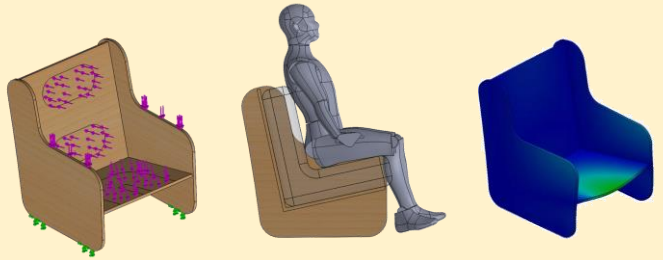
seat2D

seat2D is inspired by the frustration of furniture either be portable yet unsightly (e.g. camping chairs) or aesthetically pleasing yet bulky (e.g. sofa sets). **What if we could have both?**

This chair features flat pieces of plywood allowing it to be CNC cut and slotted together within minutes and requiring no tools. A PVC inflatable is used as a cushion to allow for comfort while still allowing it to pack flat.

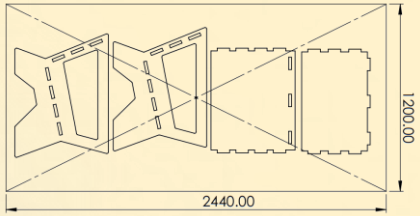
The design aims to reduce weight and material usage as much as possible while retaining ergonomics and aesthetics. seat2D's portable nature opens it up to the possibility of renting furniture rather than purchasing it.





1) Modelled a simple arm chair using a manikin for ergonomics.

2) Stress analysis and form experimentation to reduce material.



3) All parts CNC cut from 1 standard plywood sheet to reduce waste.