

Krzysztof Wancerski

PORTFOLIO

Master of Engineering
Imperial College London

ABOUT ME



www.wancerski.uk

Dean's List Design Engineer
Experienced intern and academic tutor
Team-oriented problem solver
CAD, FEA, CAM experience
Skilled in Python, C++, JS

Phone +44 7437 704039

Email krzysztofwancerski@gmail.com

Website www.wancerski.uk

MY PROJECTS

1.



Timeline

2.



BIN BIOTIC

3.



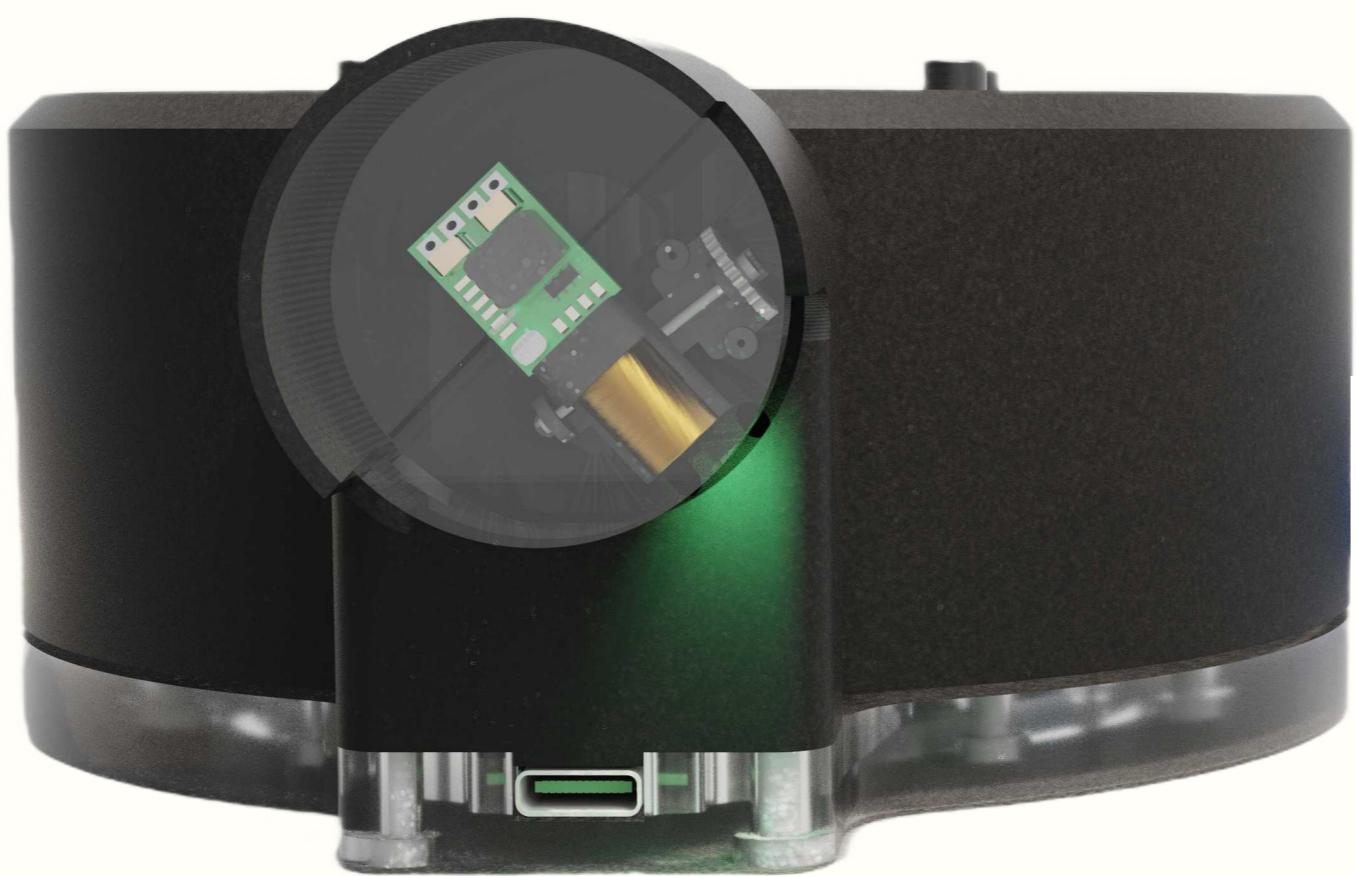
TRUCK CFD

4.



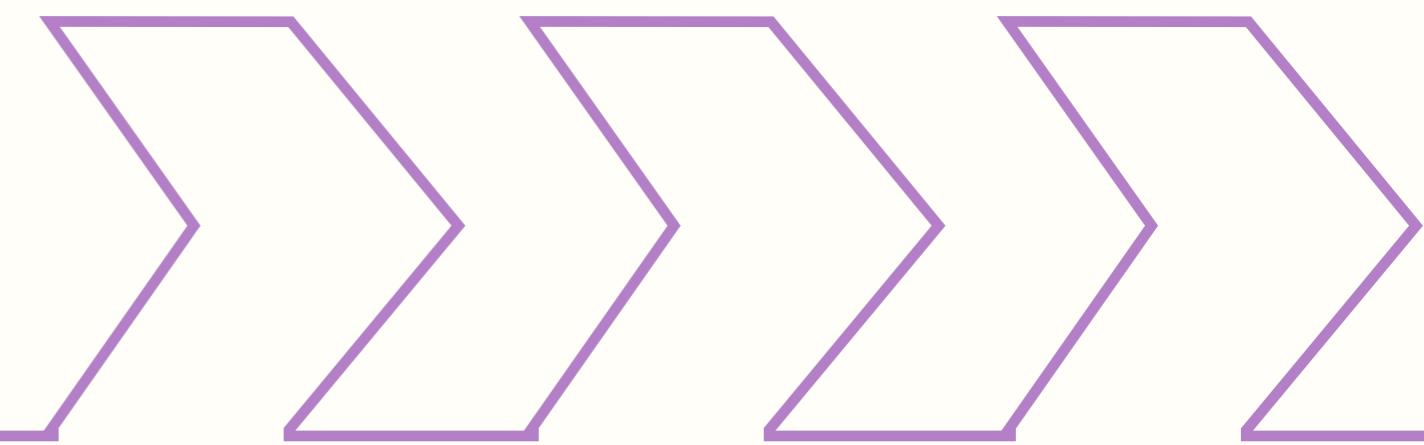
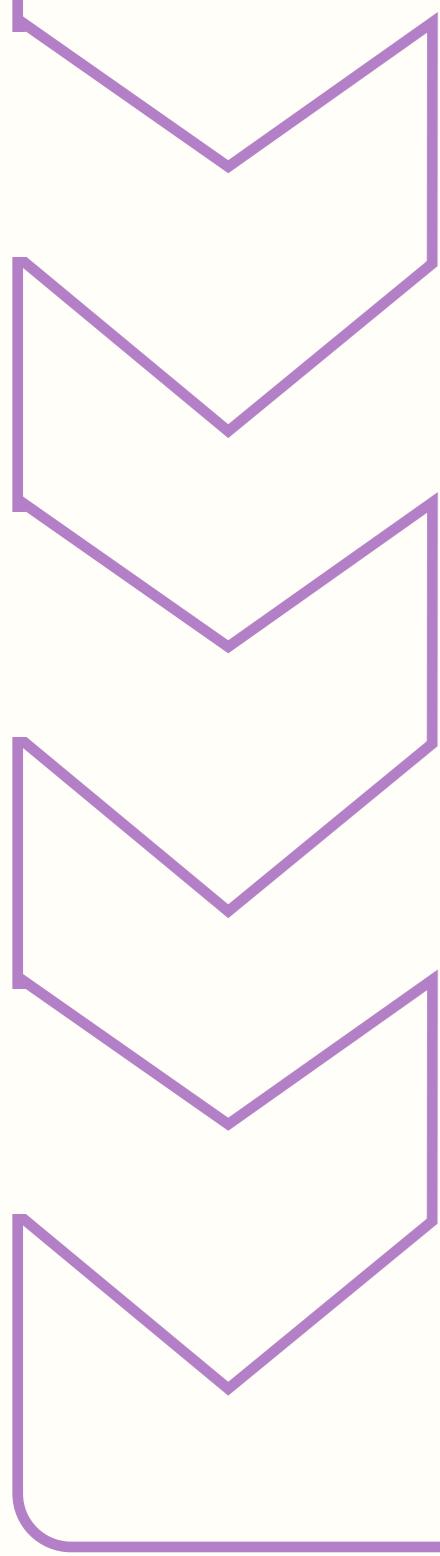
BLACK JACK+

1.



timeline

the 21st century way to organise time





fully functional prototype

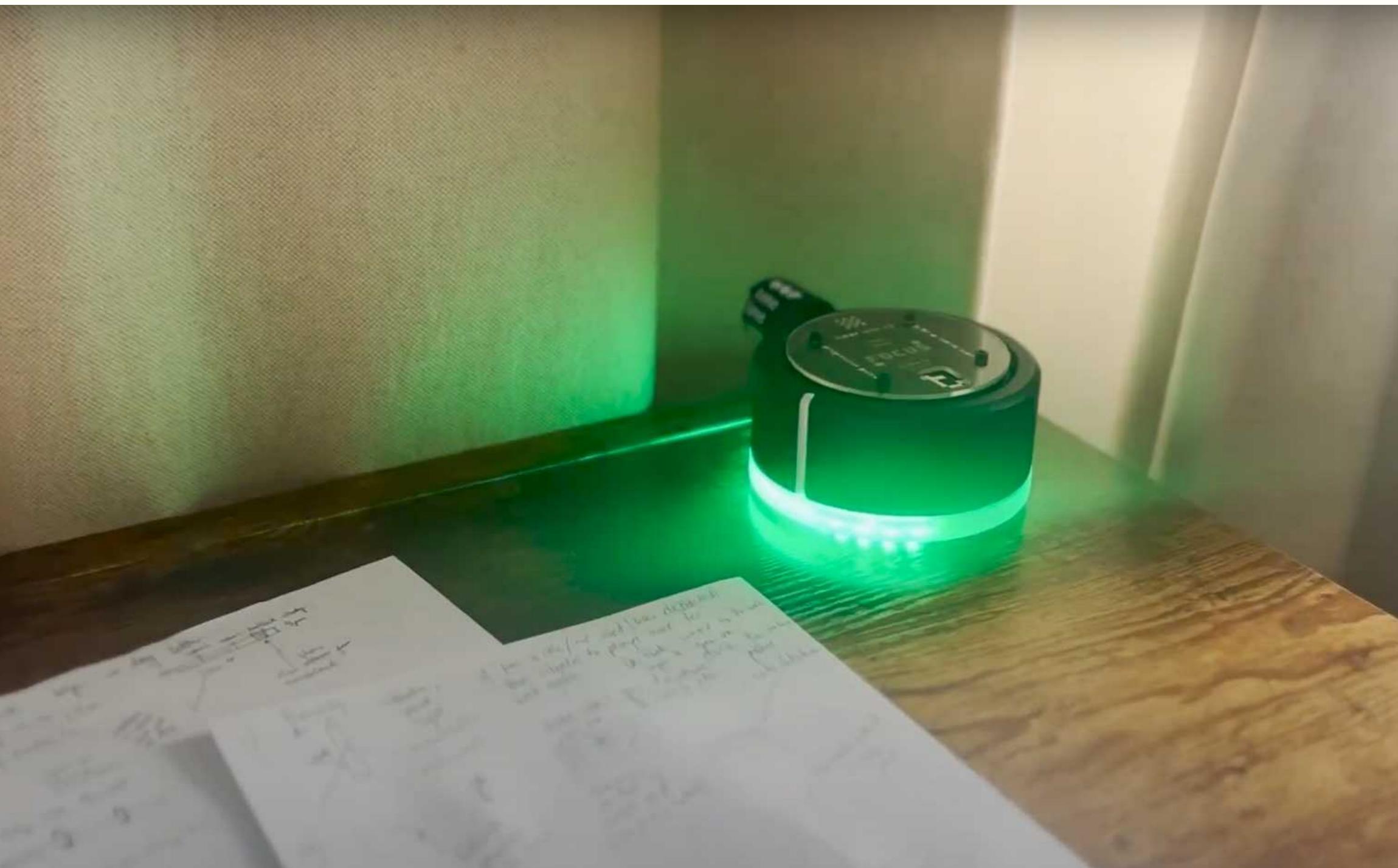


2 terms

Industrial Design Engineering
group project

Brief: Design and engineer **a battery powered hand-operated device for home**, garden or educational use that not only appeals to the mass market, but also **meets the needs of a specific (underserved) user group.**

THE IDEA

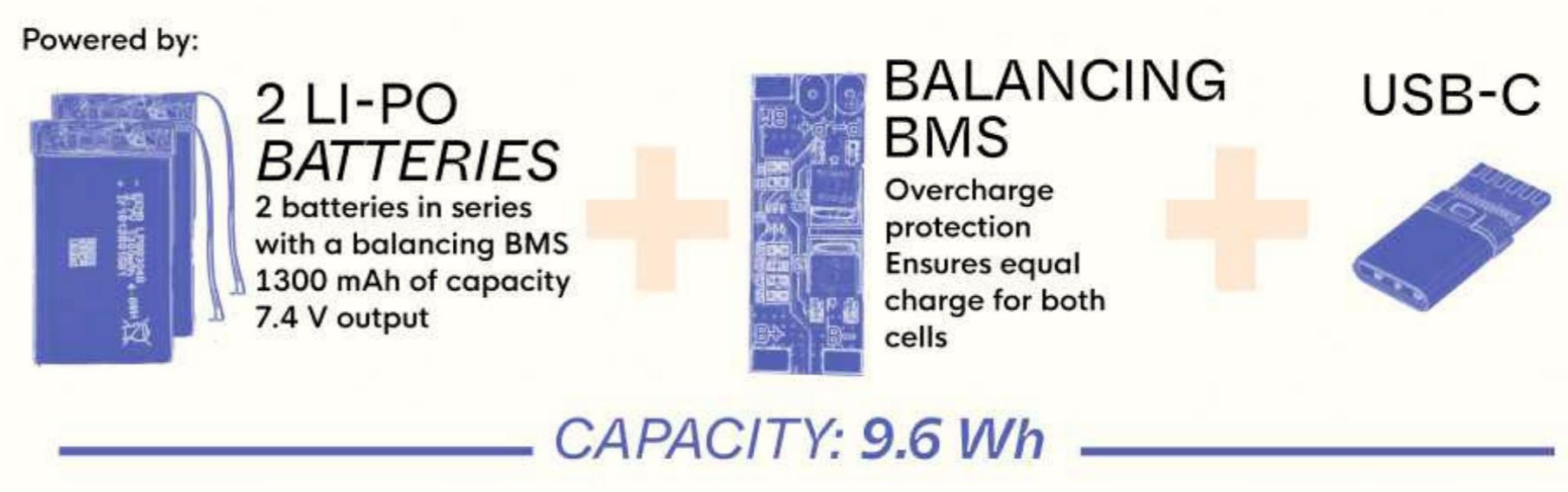
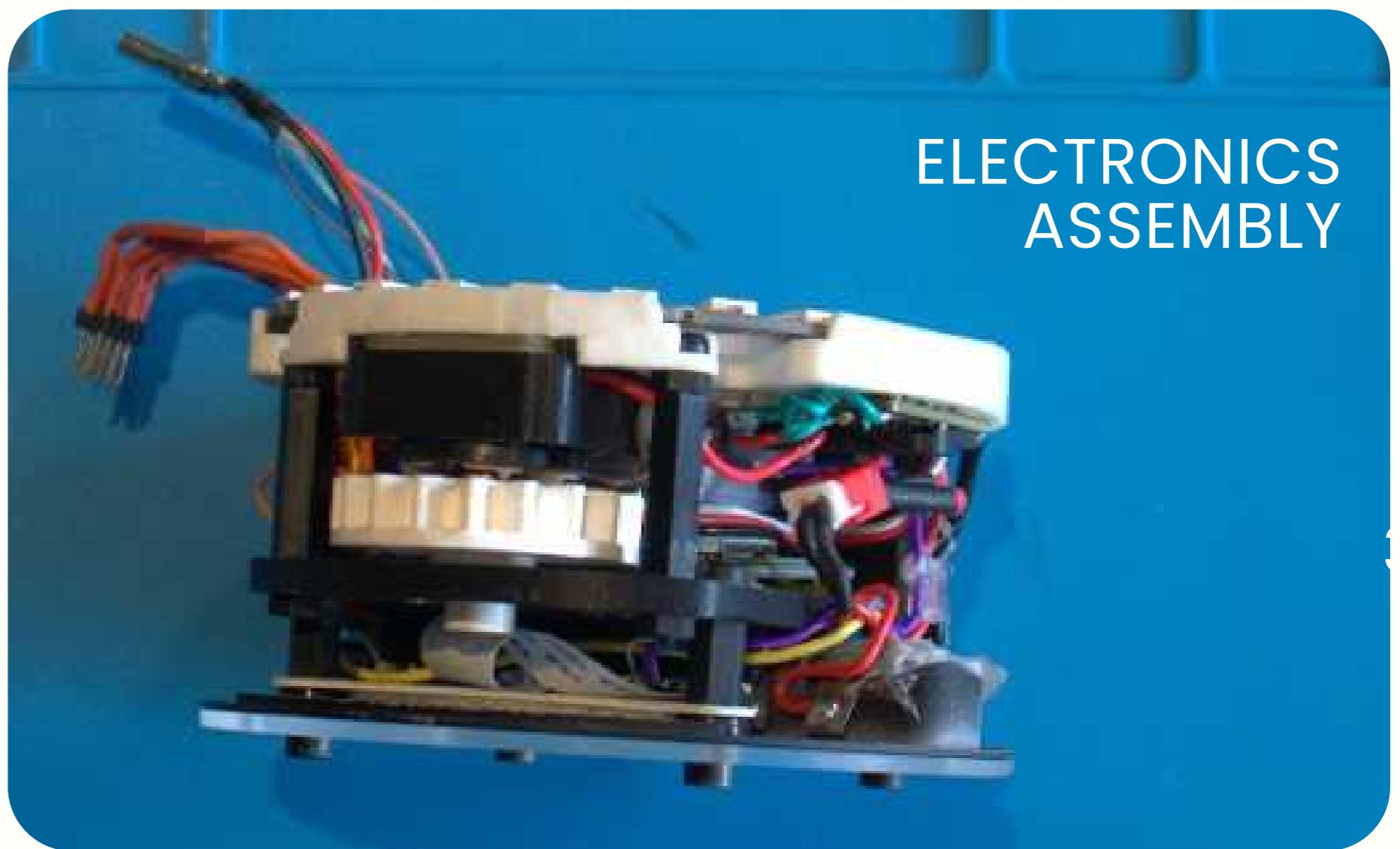
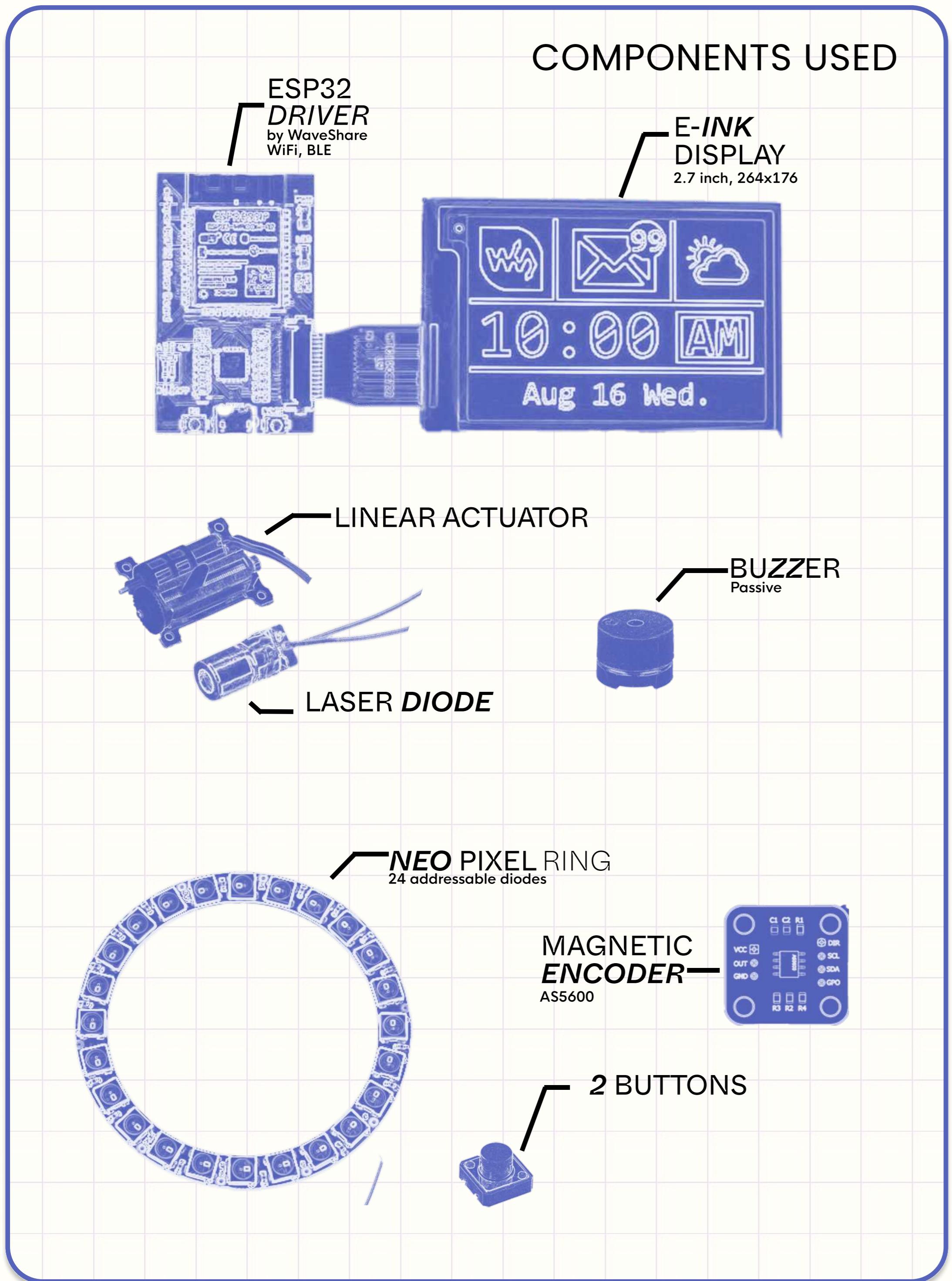


Young adults commonly experience tendencies to hyperfocus intensely and experience **time blindness**, or become easily distracted - all of which leading to incomplete tasks.

And that's why we made TimeLine - **the 21st Century way to organise time.**

MY ROLES

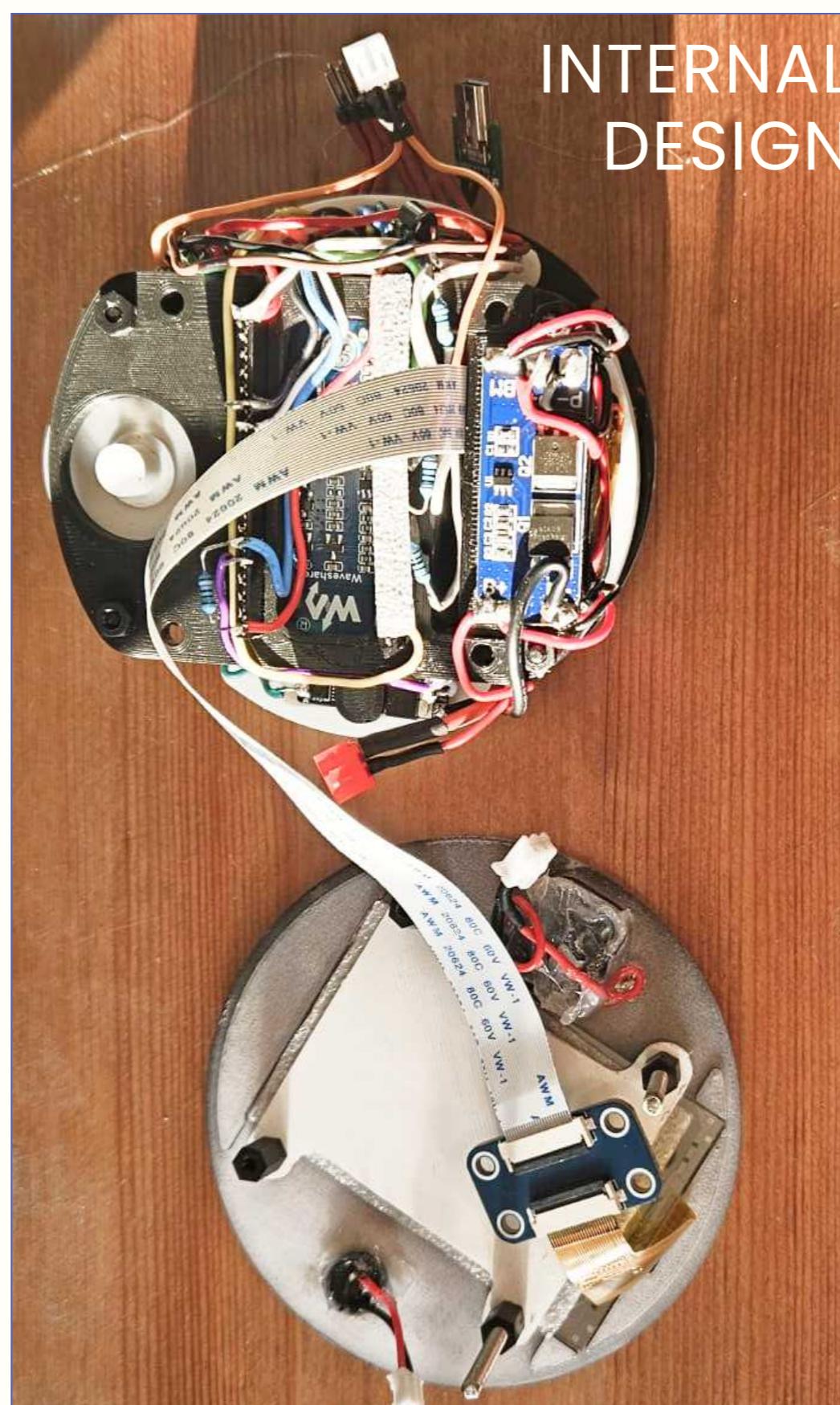
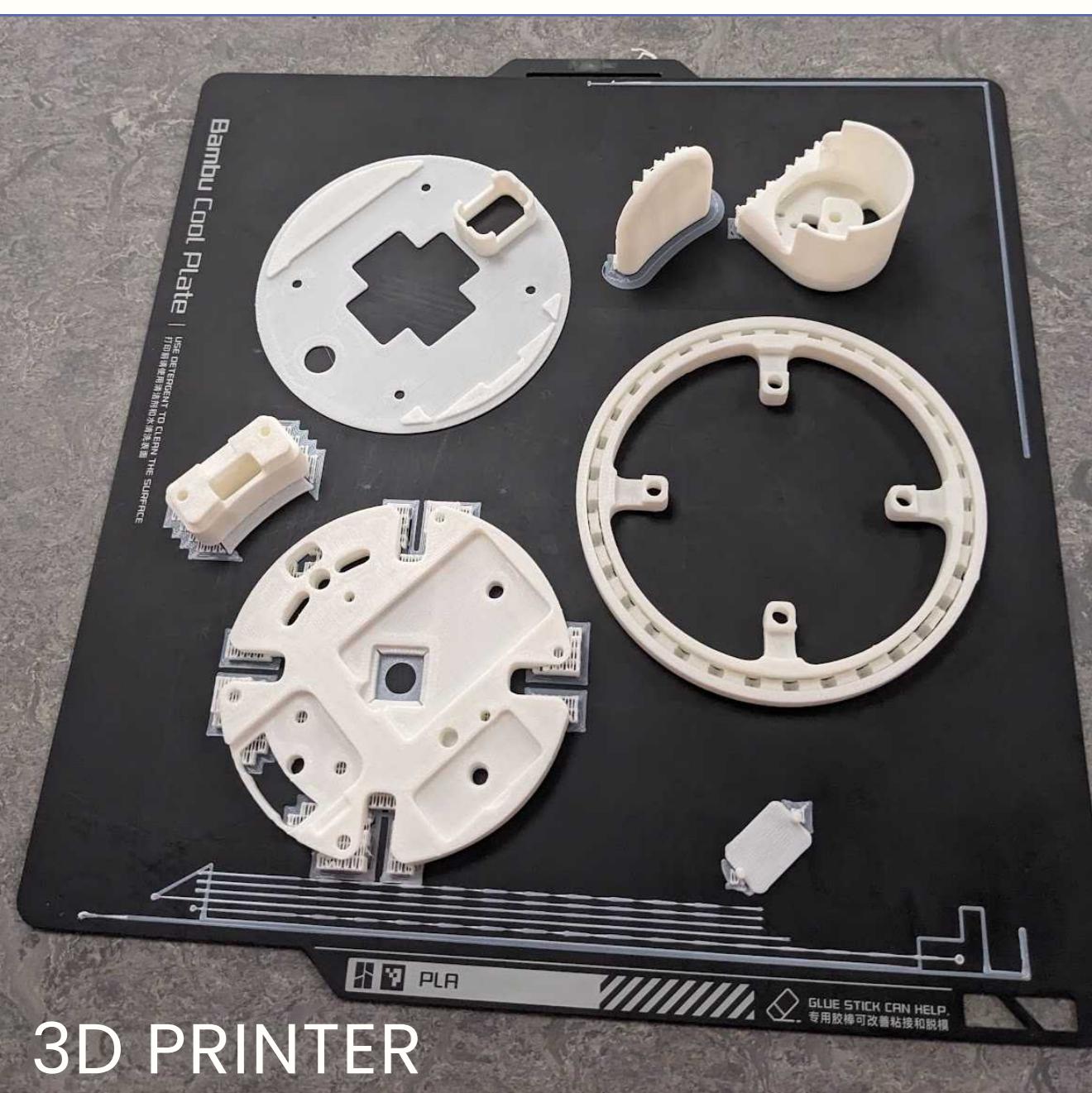
1. ELECTRONICS



Based on the established operational requirements, I researched and then selected the components listed. I then used C++ to integrate all into a fully functional prototype for testing.

MY ROLES

2. PROTOTYPING

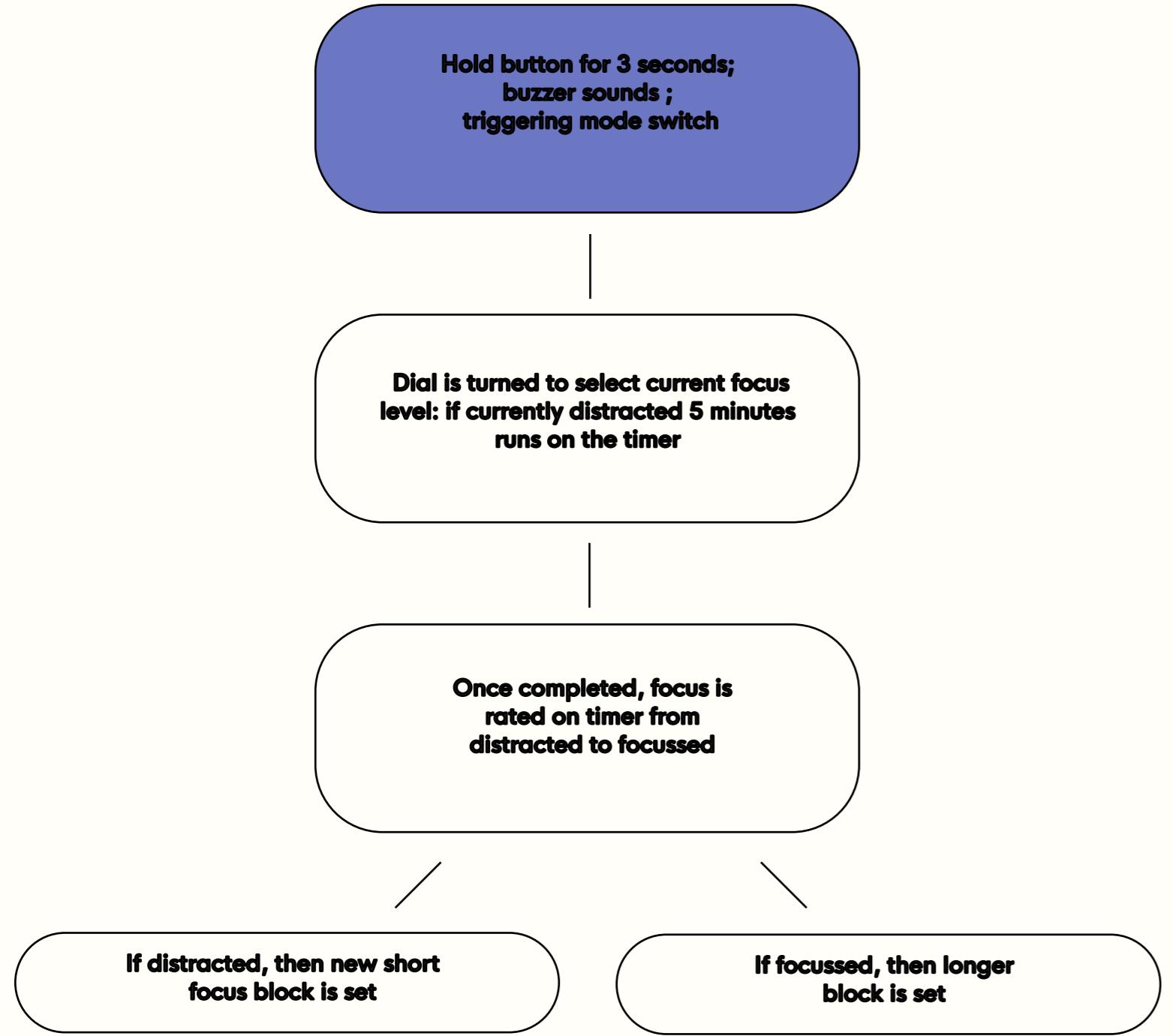


Based on the CAD designs, I prepared **CAM files for 3D printing, CNC routing and Vinyl Cutting**. I used a variety of other workshop tools, including the soldering iron.

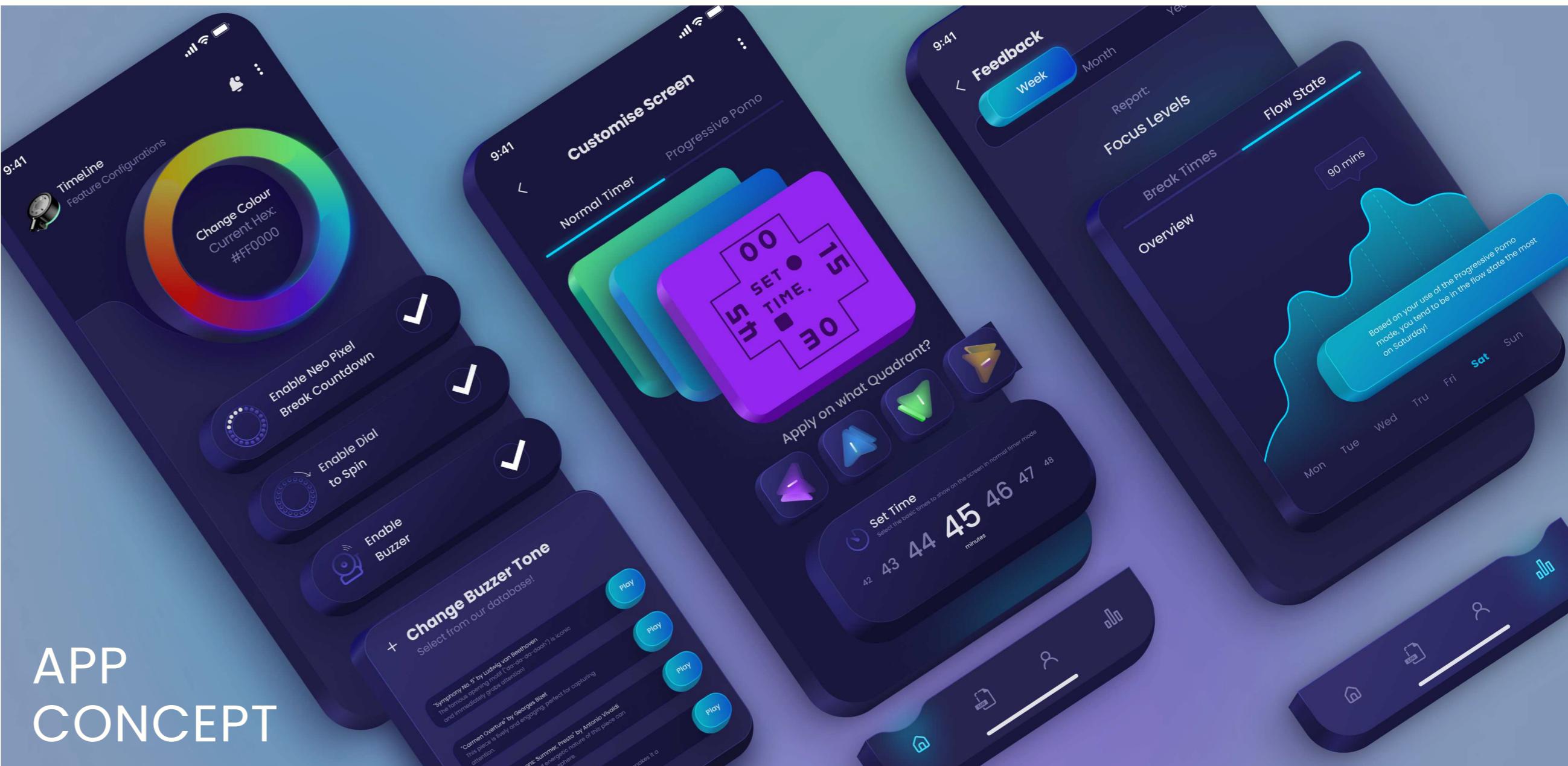
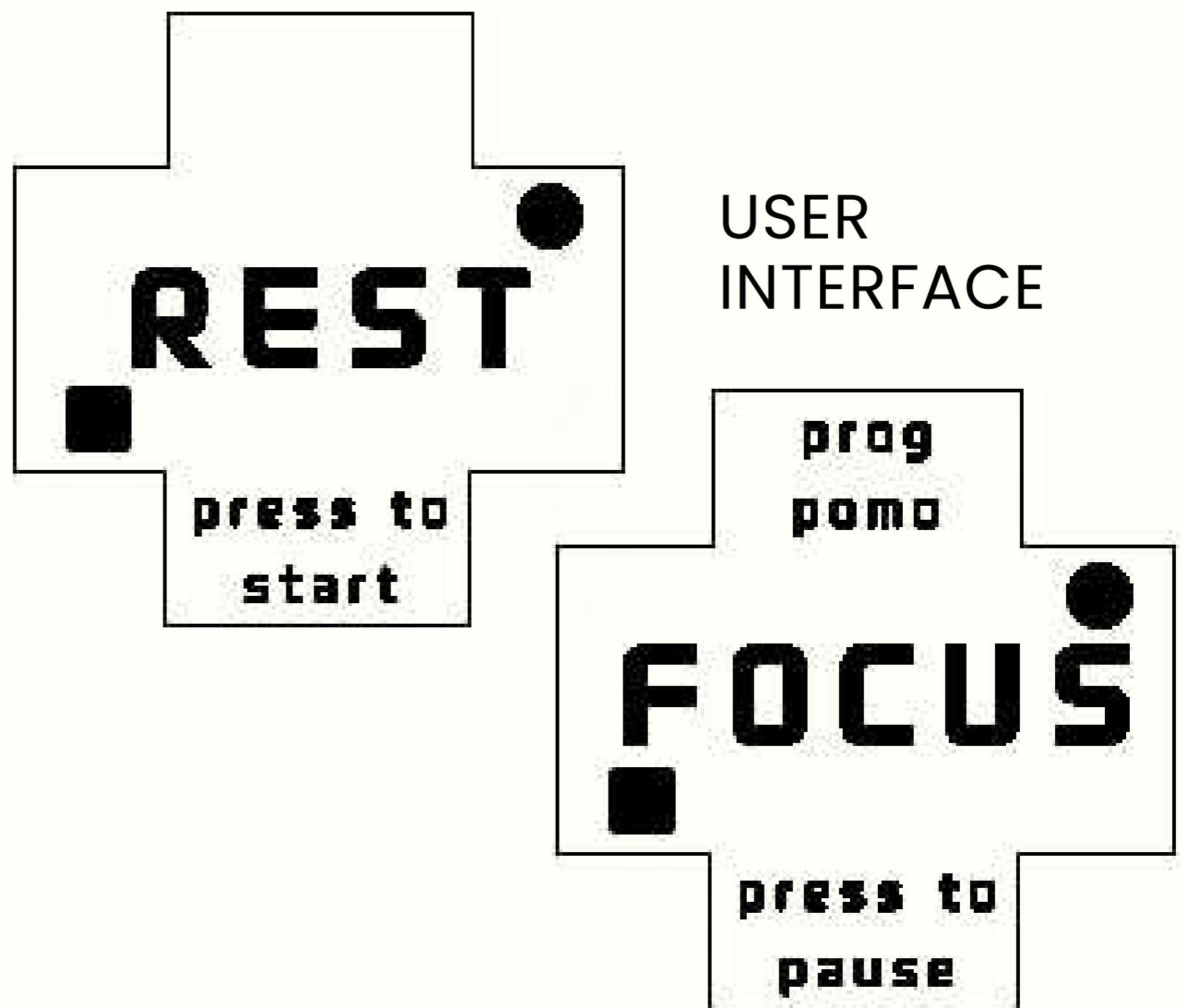
MY ROLES

3. PROGRAMMING

EXAMPLE USE



My responsibilities included **designing the user interface**, **creating a flow chart** for the user will interact with the device, **programming the device using C++ and testing**.



PRODUCT RENDERS



EXPLODED VIEW



PACKAGING DESIGN

Reimagining time as a linear progression

A timer designed to help you ~~be in the zone~~
get, stay, and leave the
zone as appropriate.



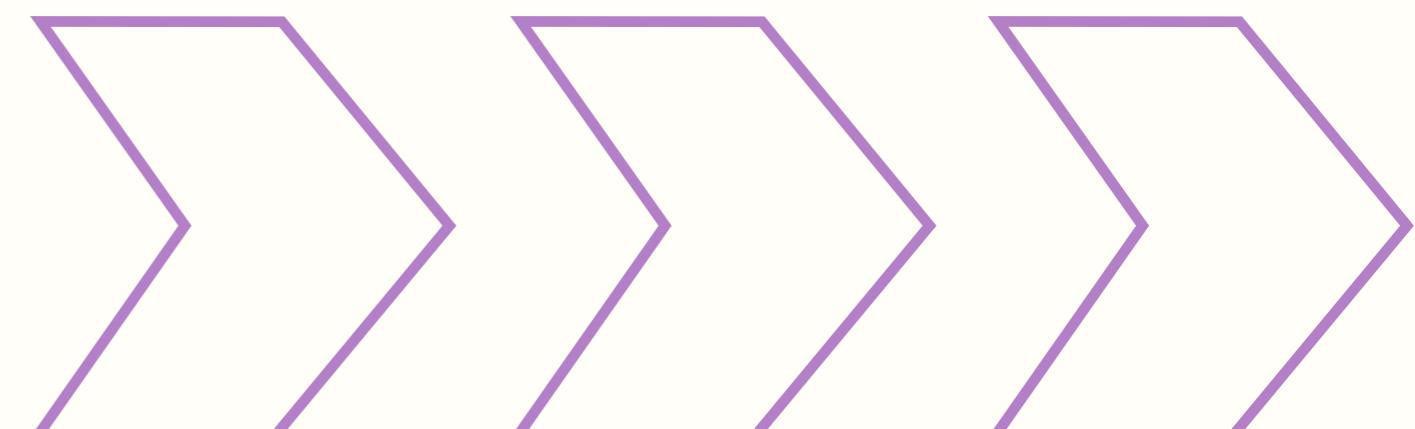
2.

2 terms

Human-Centered Design Engineering
group project



optimising urban waste collection





THE IDEA

BinBiotic can be installed in **any bin** and work in **any environment** - campus, office and city-wide.



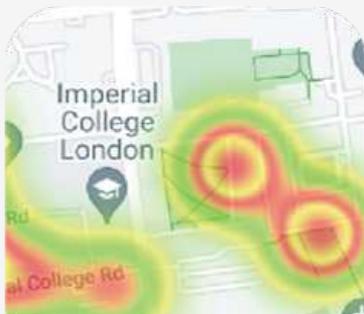
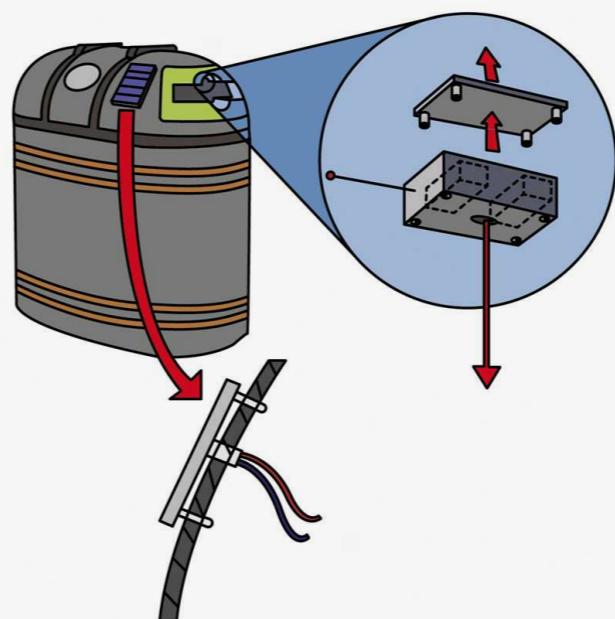
BinBiotic **collects data about the state of a bin** through a range of state-of-the-art sensors.



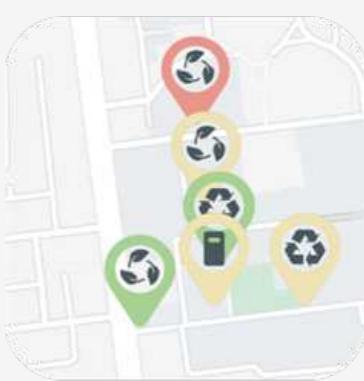
System-wide data processing creates **live, most optimal collection routes**.



Full-bins are a thing of the past!



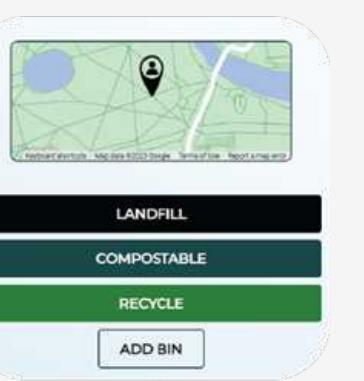
Heat Map



Map



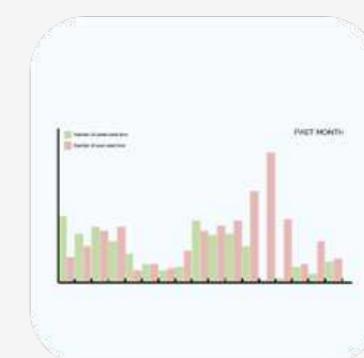
Bin State Information



Registering a Bin

Bin	Street
1 ASD7H	55 Victoria Road, London, SE15 8RV
2 F7BU	228 Stanley Road, London, SE15 8PV
3 BUKC4	228 Stanley Road, London, SE15 8PV
4 ASD7H	56 Victoria Road, London, SE15 8VJ
5 F7BU	229 Stanley Road, London, SE15 8AX
6 BUKC5	93 Grange Road, London, SW76 5OH
7 ASD7H	57 Victoria Road, London, SE15 8VJ
8 F7BU	230 Stanley Road, London, SE15 8AX
9 BUKC6	92 Grange Road, London, SW76 5OH
10 ASD7H	58 Victoria Road, London, SE15 8VJ
11 F7BU	231 Stanley Road, London, SE15 8PV
12 BUKC7	93 Grange Road, London, SW76 5OH
13 ASD7H	59 Victoria Road, London, SE15 8VJ
14 F7BU	232 Stanley Road, London, SE15 8AX
15 BUKC8	94 Grange Road, London, SW76 5OH
16 ASD7H	60 Victoria Road, London, SE15 8VJ
17 F7BU	233 Stanley Road, London, SE15 8AX
18 BUKC9	95 Grange Road, London, SW76 5OH

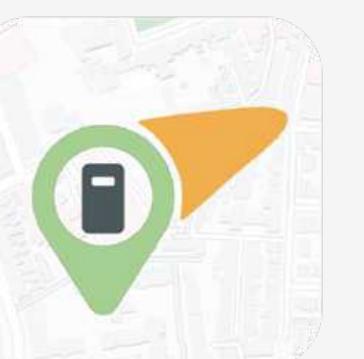
Operator Schedule Generator



Usage Analytics

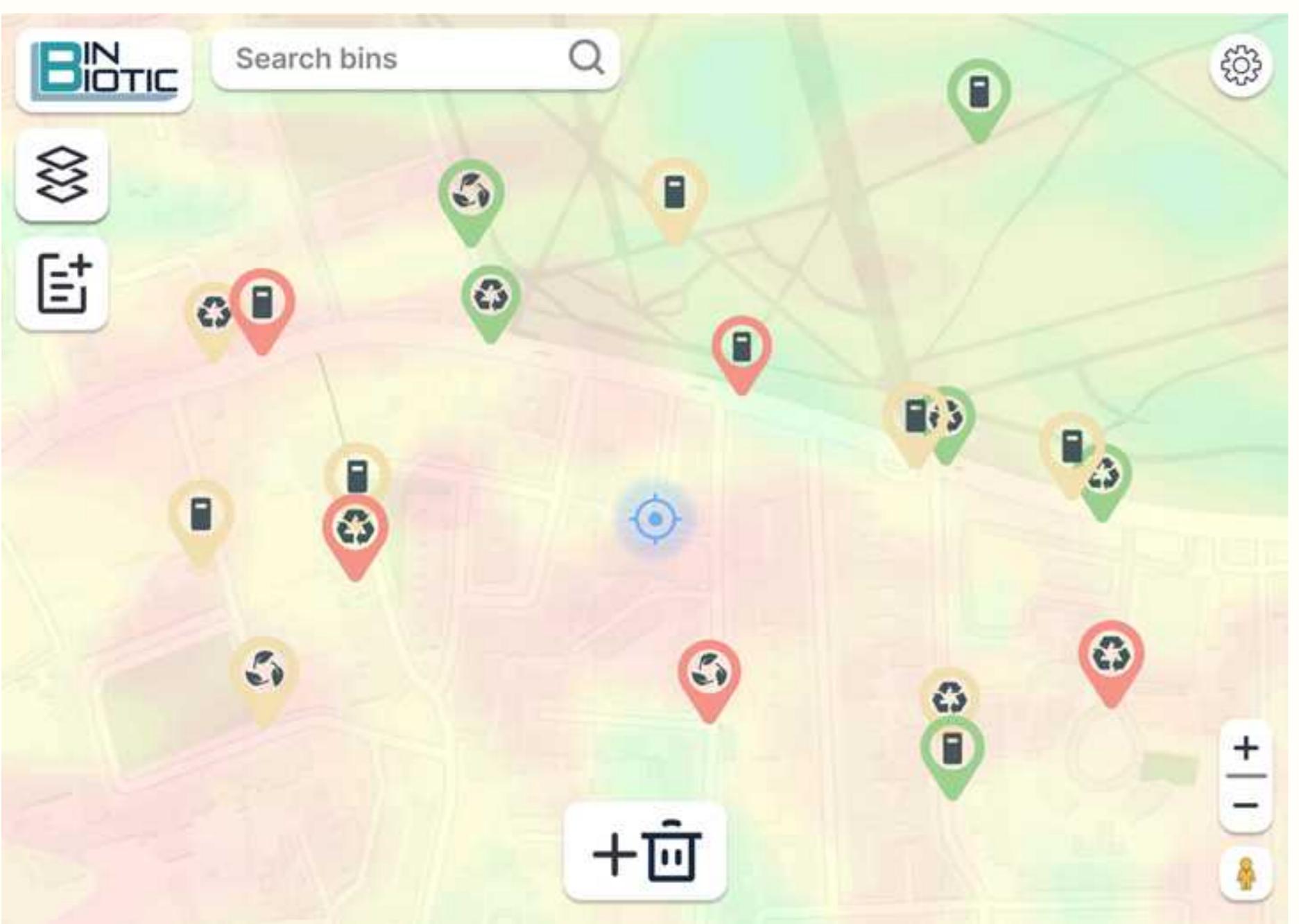


Bin Issue Warning



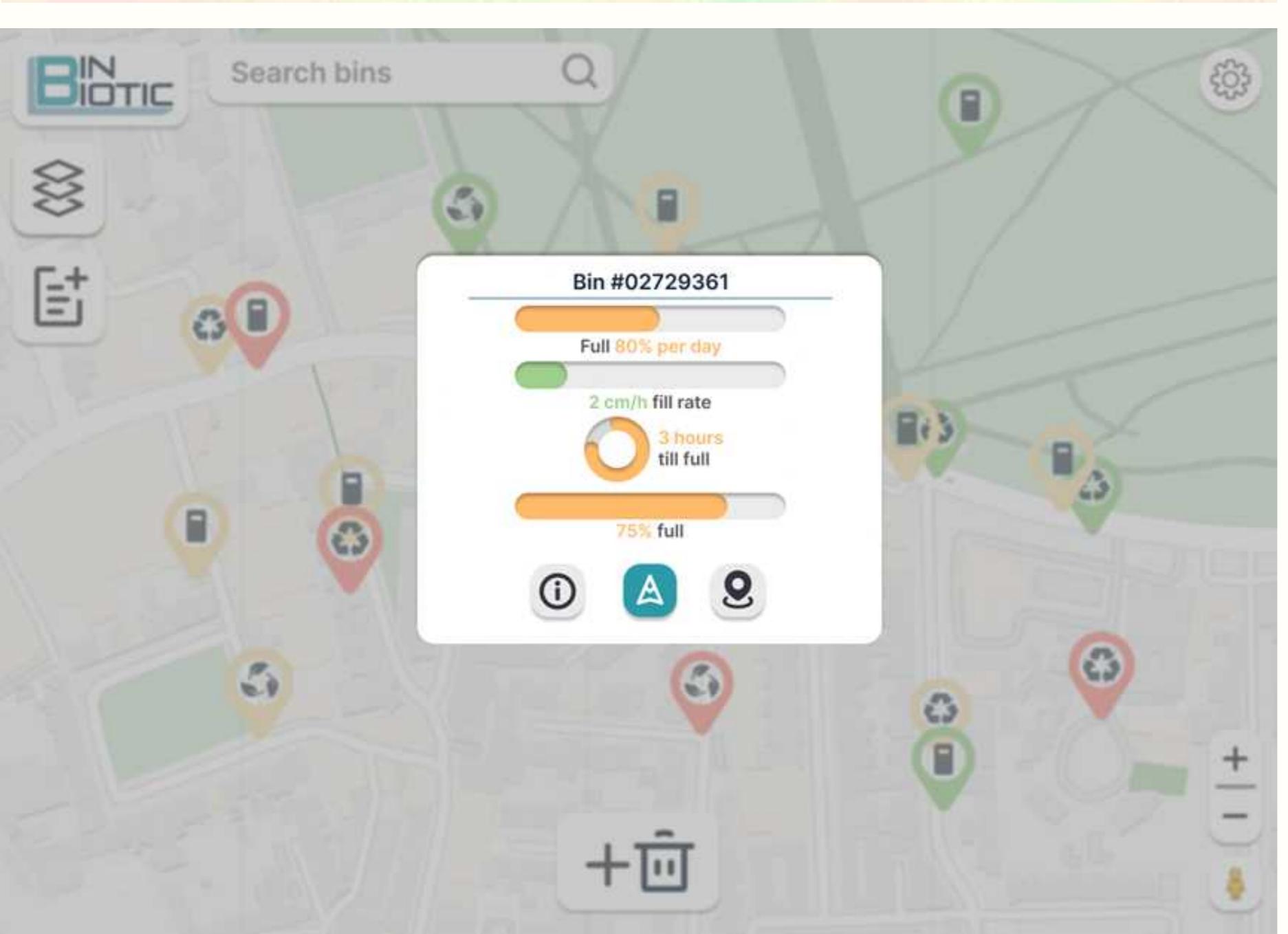
Bin Placement Optimisation

DIGITAL PROTOTYPE



ADMIN VIEW

Administrator console developed through **co-design sessions with relevant stakeholders**, including the site operations manager at Imperial.



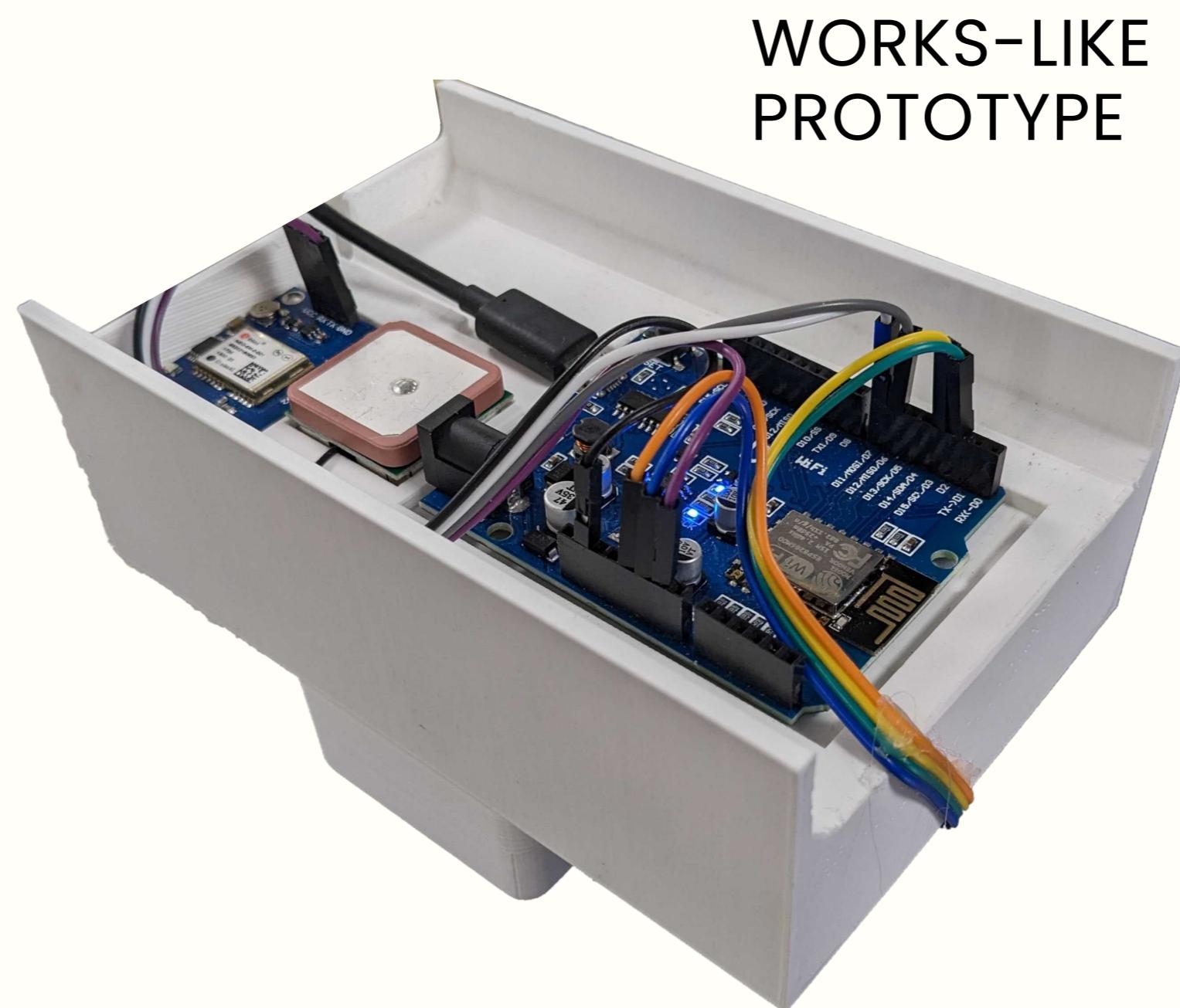
PUBLIC APP

Public user app developed and iterated upon with potential app users.



PHYSICAL PROTOTYPE

Using a **GPS antenna** and an **ultrasonic sensor**, I created the works like prototype. This connected over GSM to a Firebase server which processed the data and displayed it our app.

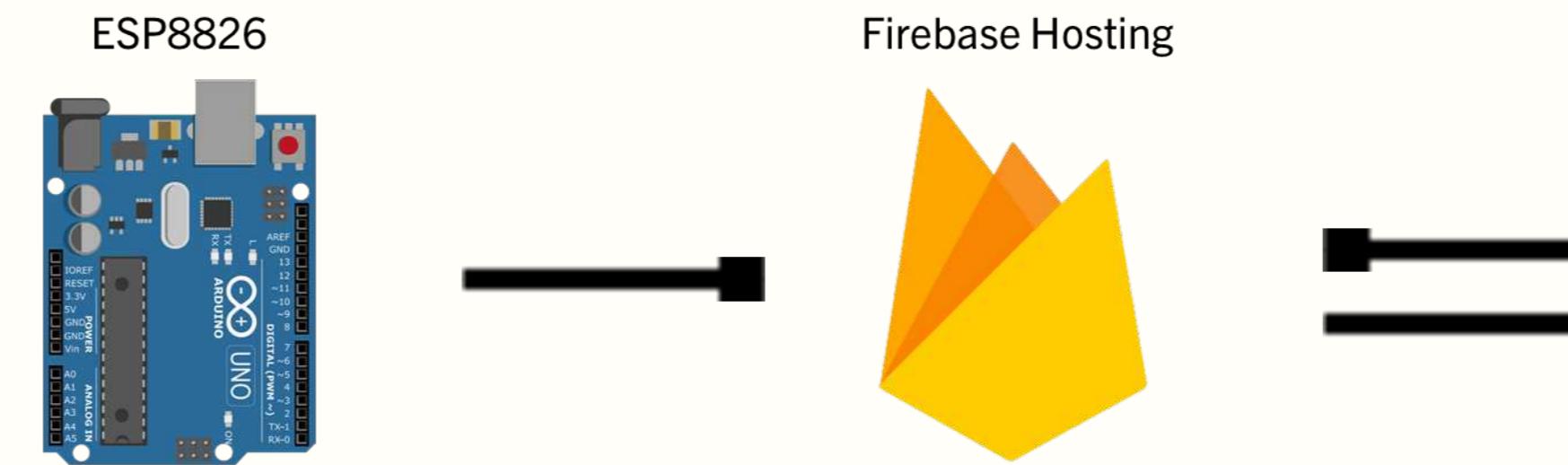


WORKS-LIKE
PROTOTYPE

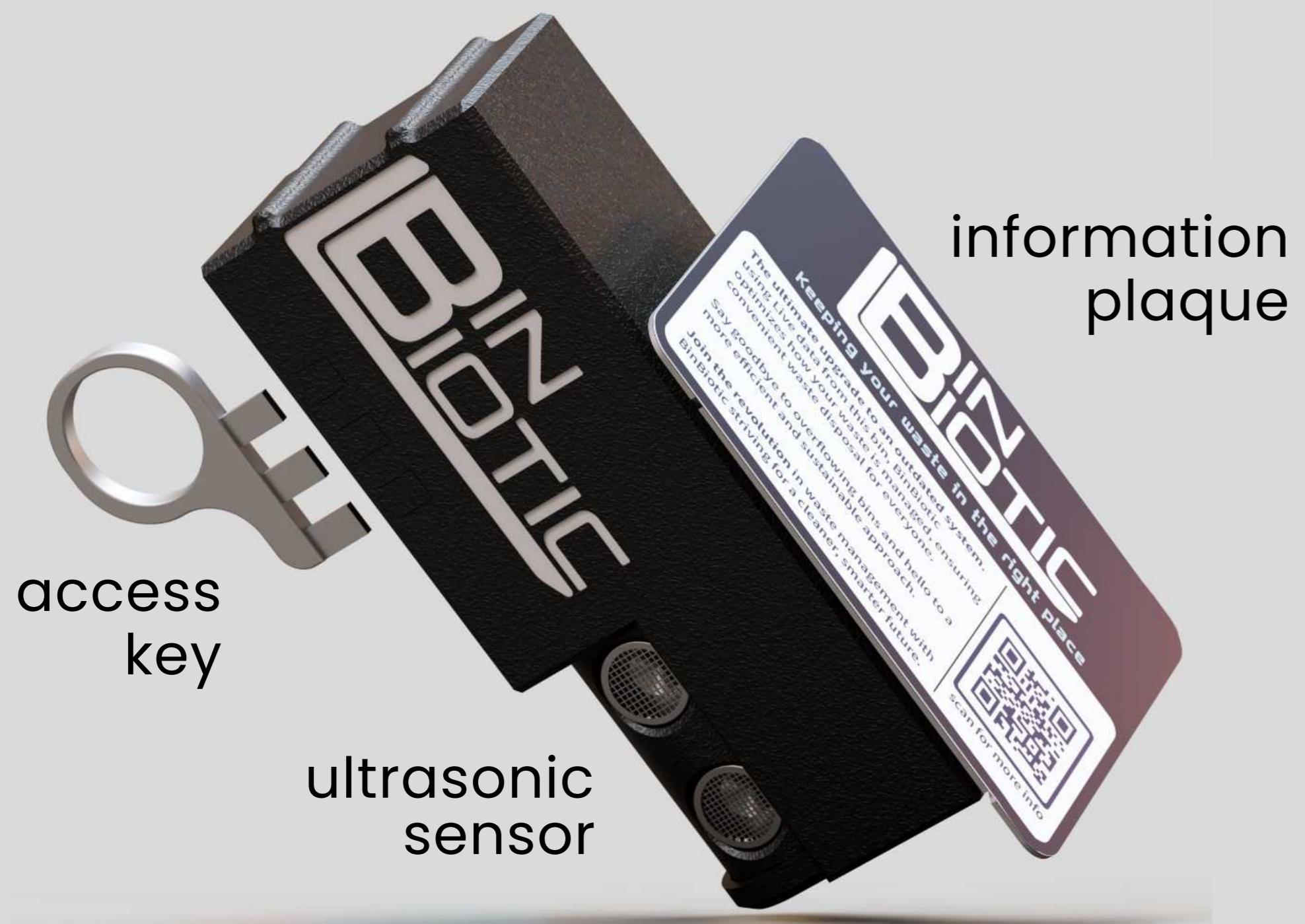


TESTING

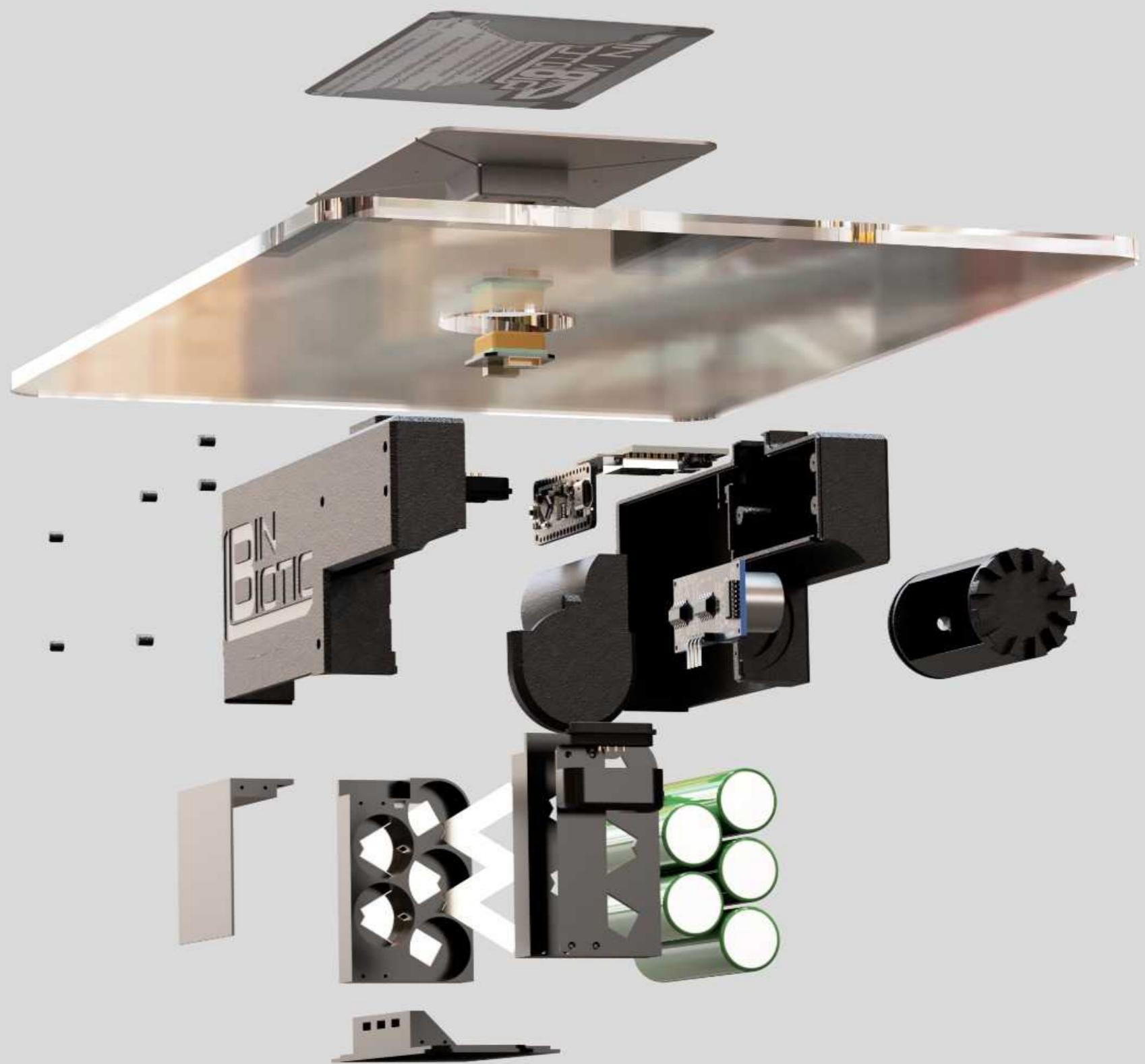
SYSTEM DIAGRAM



Web App



DESIGN FOR
MANUFACTURE AND
ASSEMBLY



3.

1/2 term

Computational Fluid Dynamics
solo project



TRUCK **CFD**

CFD analysis of a self-designed pick-up

THE PROJECT



3D SURFACE
MODELING

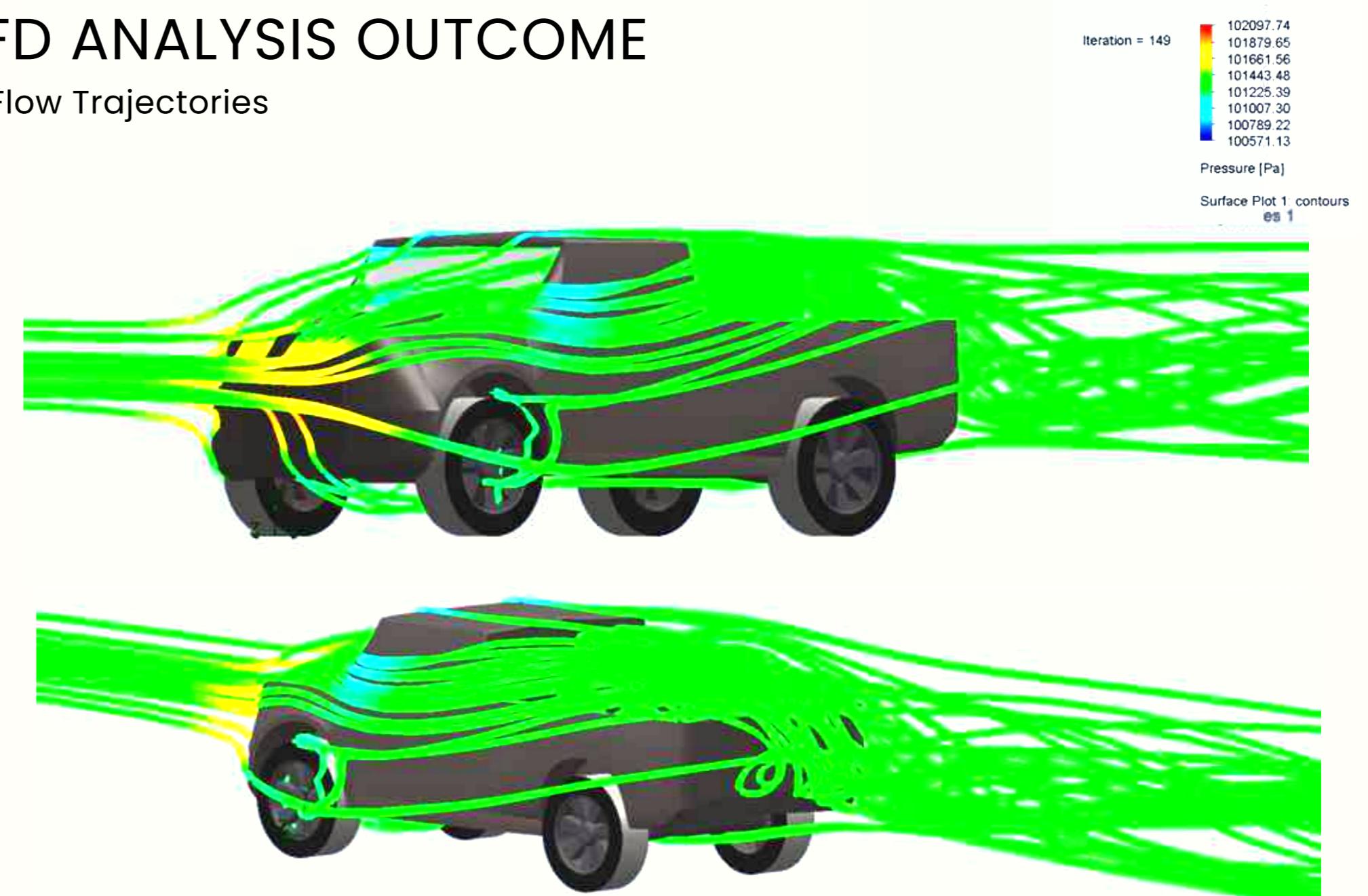


Brief: Select a **vehicle archetype to explore, research and undertake outline modelling in order to assess the aerodynamic performance** of a new product for launch in the market and present your arising concept.

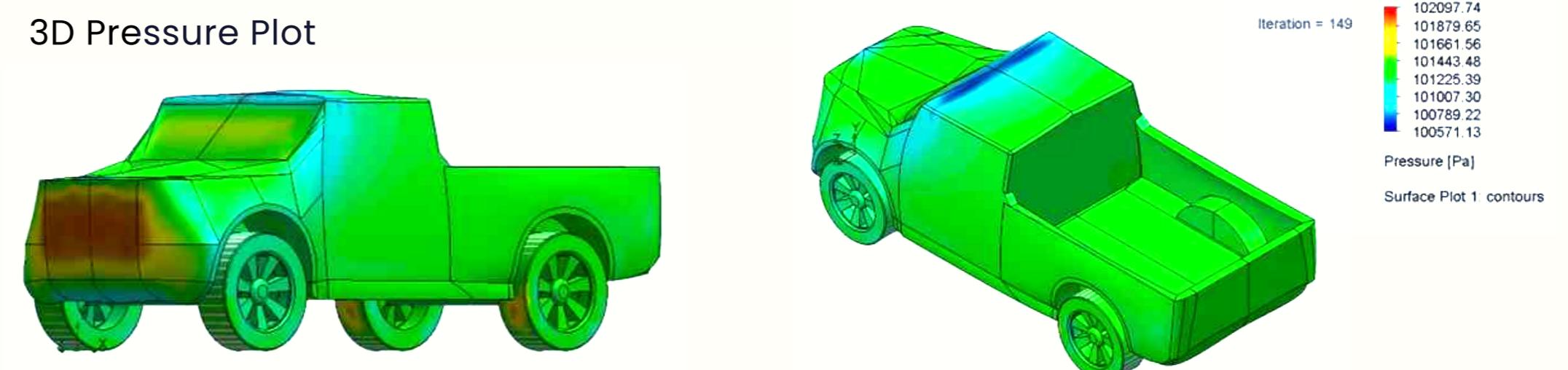
OUTCOME

CFD ANALYSIS OUTCOME

3D Flow Trajectories



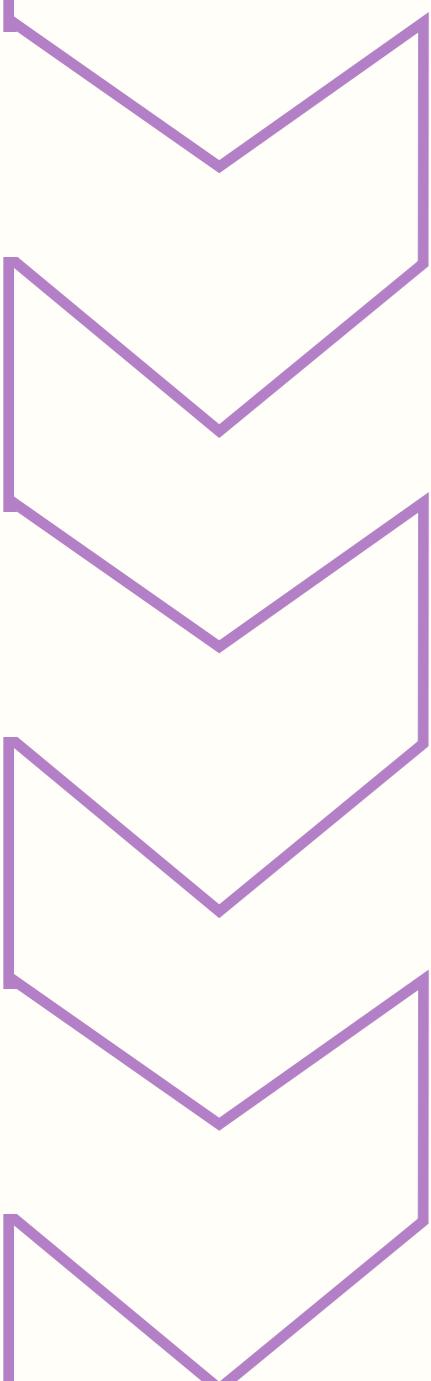
3D Pressure Plot



Overall, the analysis showed that my design for the pick-up was comparable to the Ford F150 in terms of aerodynamics.

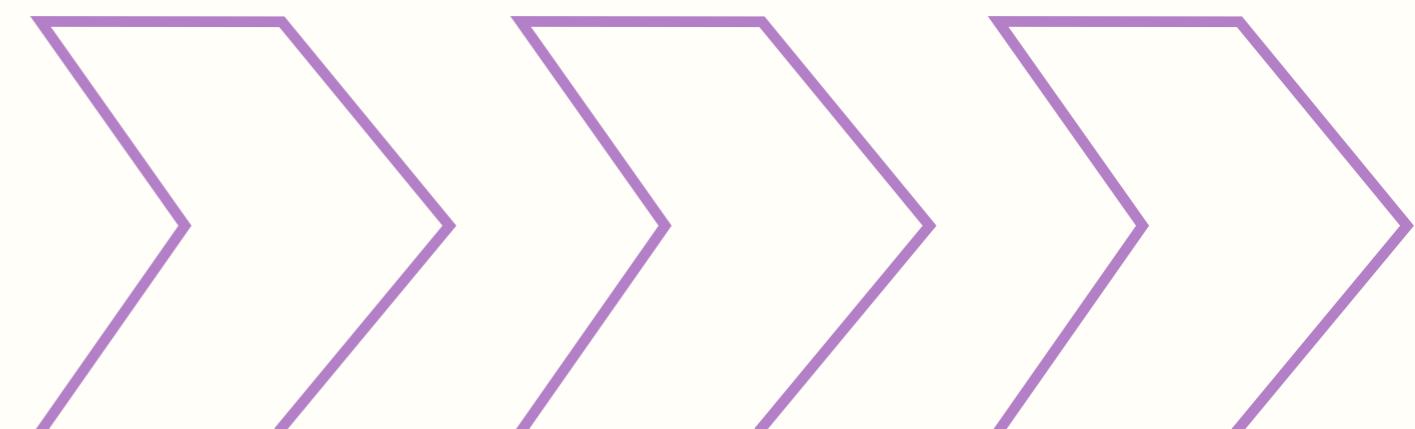
SolidWorks and **Ansys** were used to generate the simulations and hand calculations were later used to verify that these are as expected.

4.

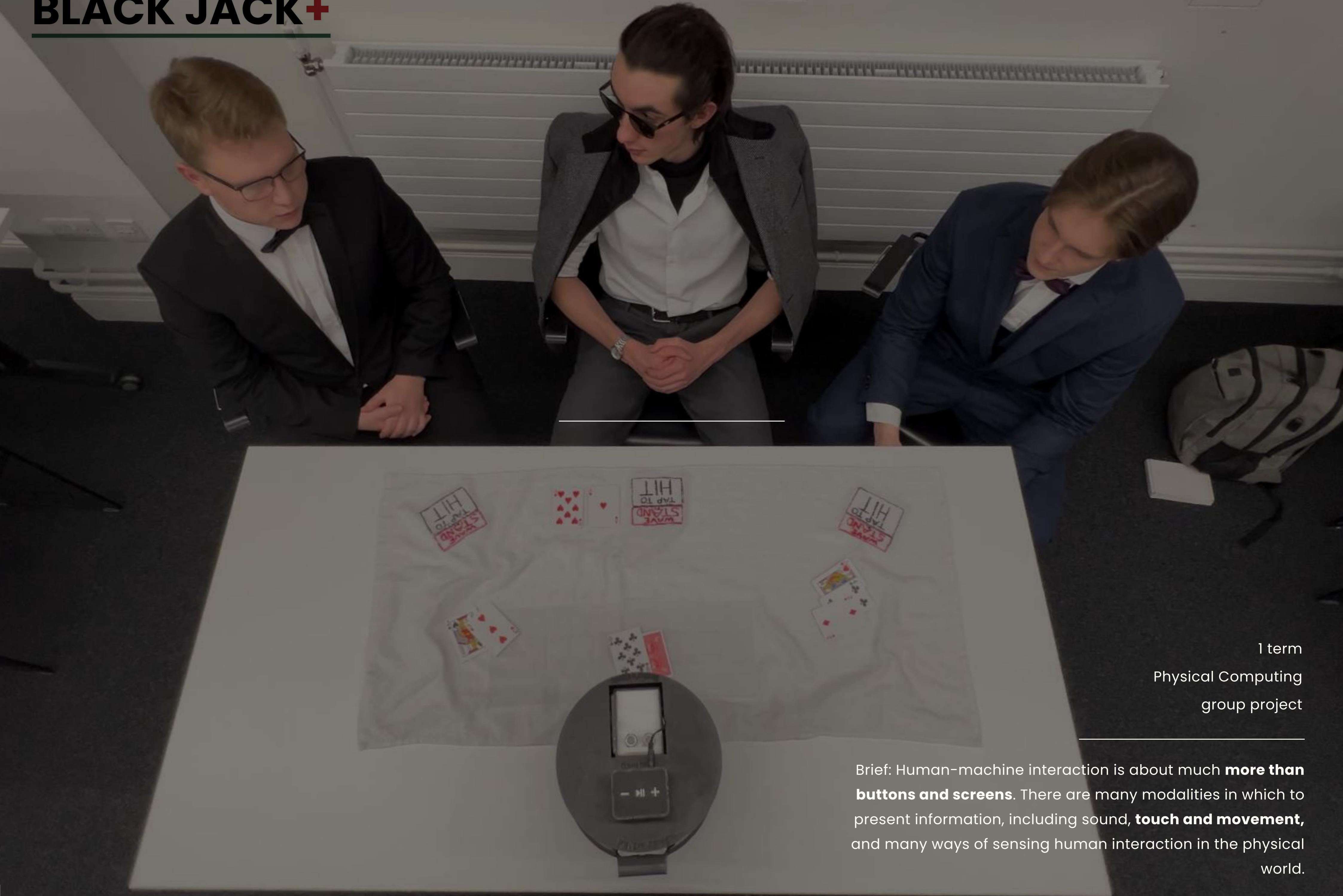


a fun, novel way to play cards

BLACK JACK+



BLACK JACK+



1 term

Physical Computing
group project

Brief: Human-machine interaction is about much **more than buttons and screens**. There are many modalities in which to present information, including sound, **touch and movement**, and many ways of sensing human interaction in the physical world.

BLACK JACK+

OUTCOME



USER INTERFACE



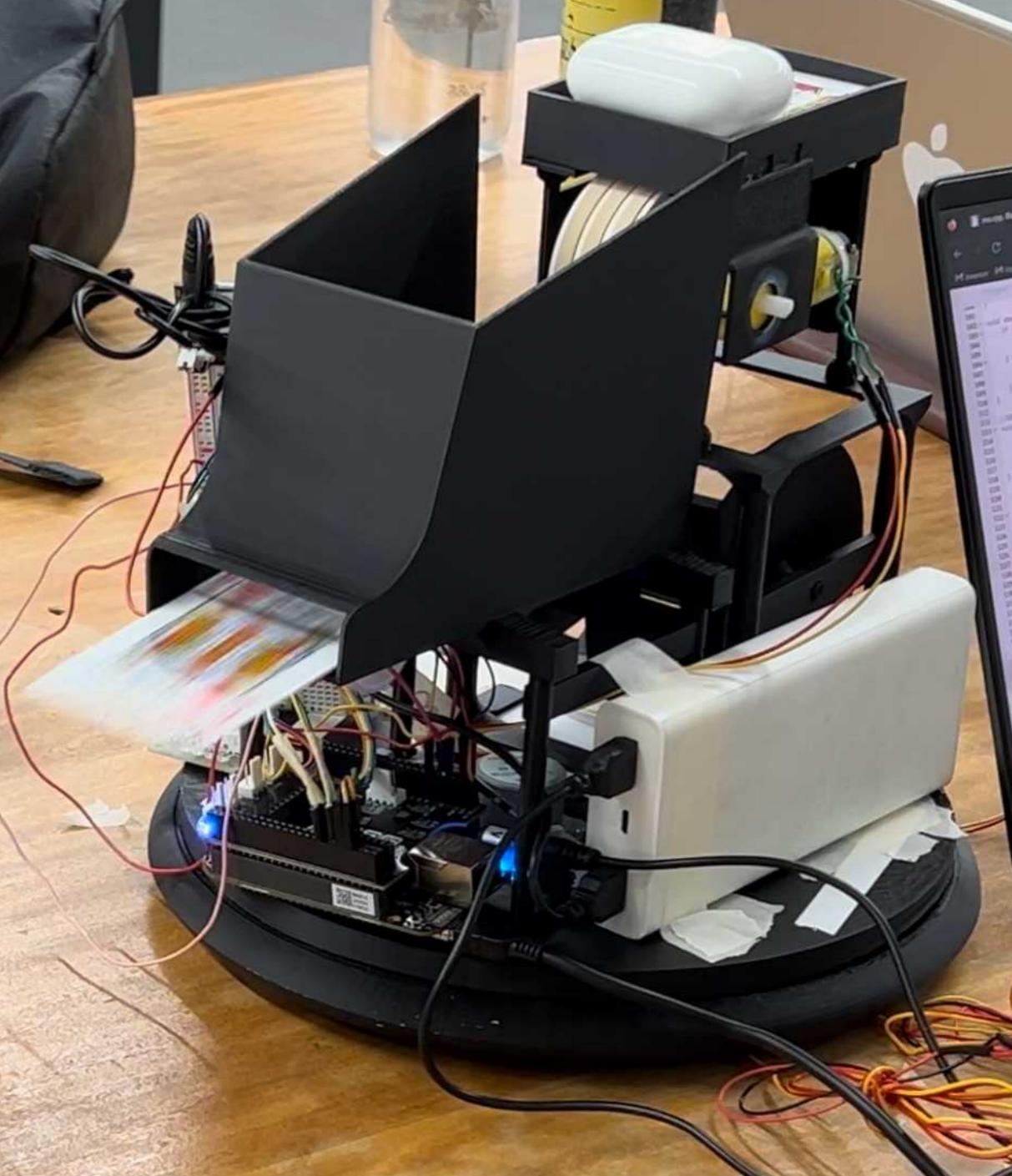
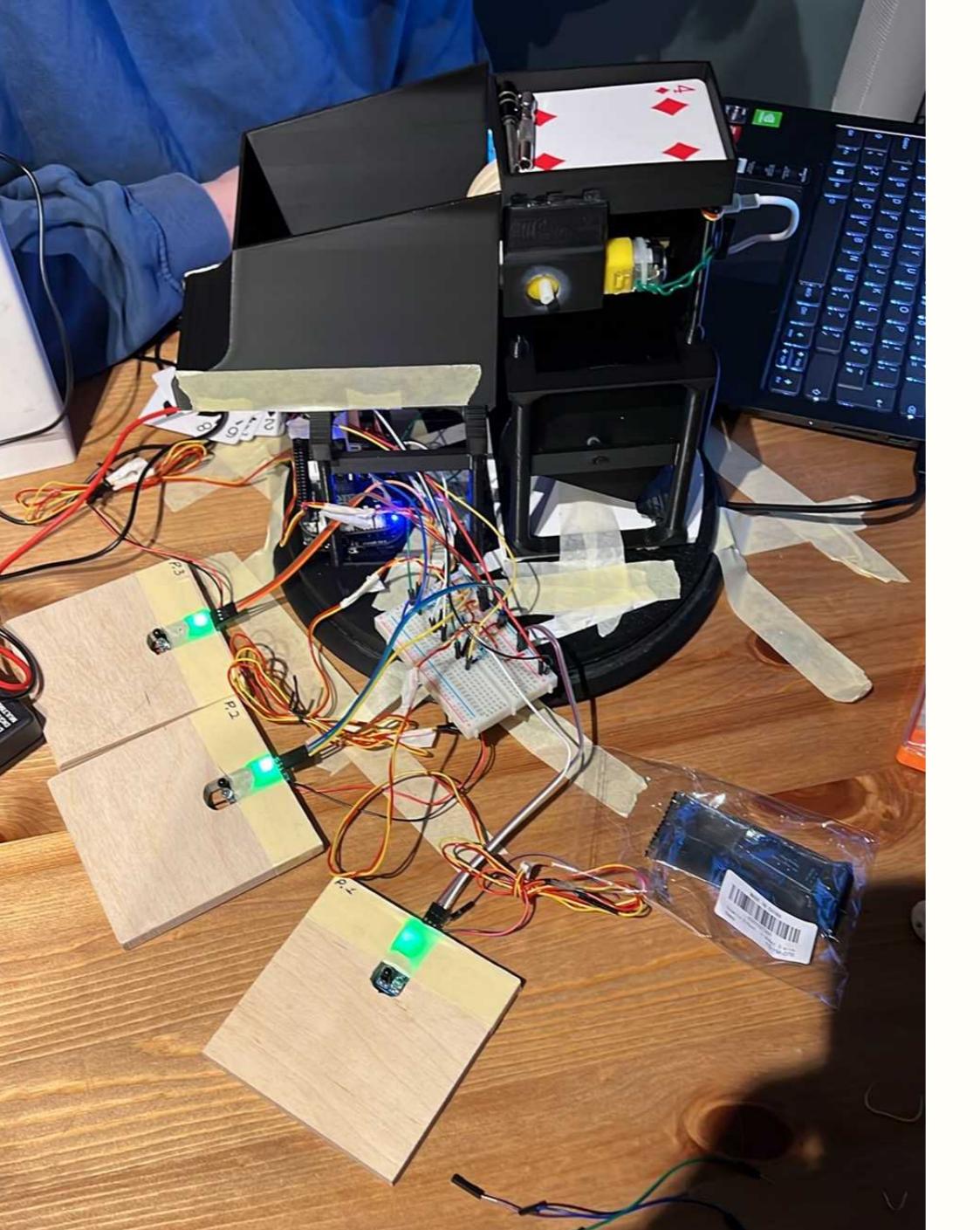
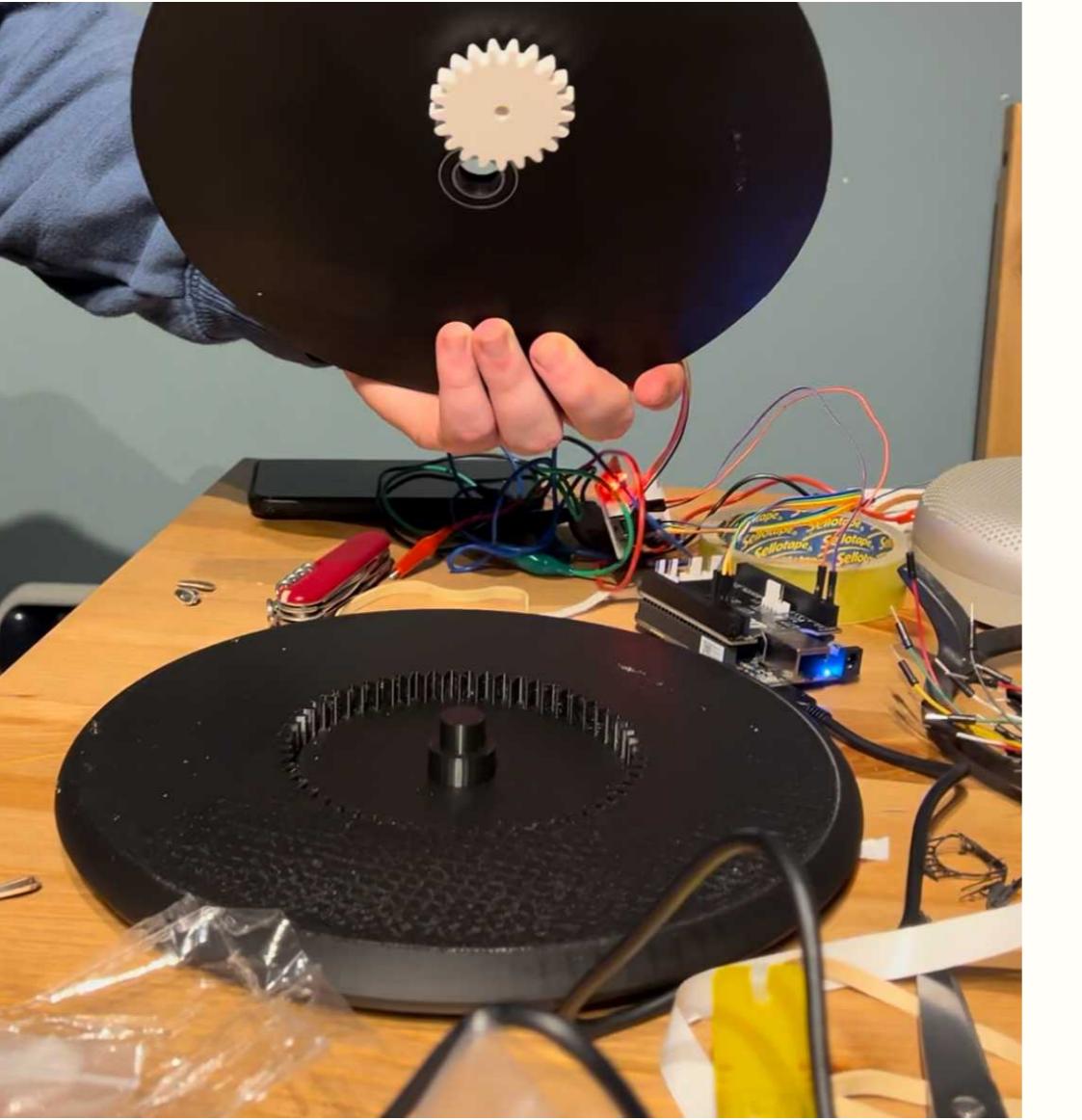
FINAL PROTOTYPE



360 degree rotation

A **fun, interactive and fully working robot** was developed which allowed users to play Black Jack, **without the need for a human dealer**, while still using physical cards.

PROCESS



The design challenges included **managing external cables** that get **entangled in the rotating assembly**, which is addressed by implementing a planetary gear system and center routing. Unreliable one-at-a-time card dispensing is tackled by adding a rollback feature to retract extra cards. For **seamless tracking of blackjack gestures**, **embedded infrared (IR) and piezo sensors are integrated into the table mat**. Power management issues and limited current are resolved by isolating motors and incorporating an additional power supply.

CONTACT

Phone

+44 7437 704039

Email

krzysztofwancerski@gmail.com