

PORTFOLIO

DAVID SERNA

Who am I?

Hello, I'm David, a 24 year old MA student in Automotive and Transport design at Coventry university in Coventry, United Kingdom.

I graduated as a Product designer with ESNE university in Madrid, with a passion for crafting innovative and meaningful solutions that elevate user experiences. Such ability helped me being chosen to participate in 2021 in a collaborative project between ESNE university from Spain, Pratt institute of New York, EAPD of Puerto Rico and the Socentlabo organisation to design solutions for emergencies.

My creative journey has been enriched by diverse experiences, from exhibiting my oil paintings as part of the artist association Teselarum in Tres Cantos, to participating in the First Lego League, where my team advanced to the international phase in Aarhus in 2016.

I particularly enjoy bringing ideas to life through the creation of objects and physical prototypes, ensuring designs are both tangible and impactful. I am committed to shaping the future of design through empathetic and forward-thinking approaches. By exploring new forms, materials, and technologies, I aim to contribute to innovative solutions that inspire curiosity to used them, sustainability, and human connection



HELLO!
I'M DAVID

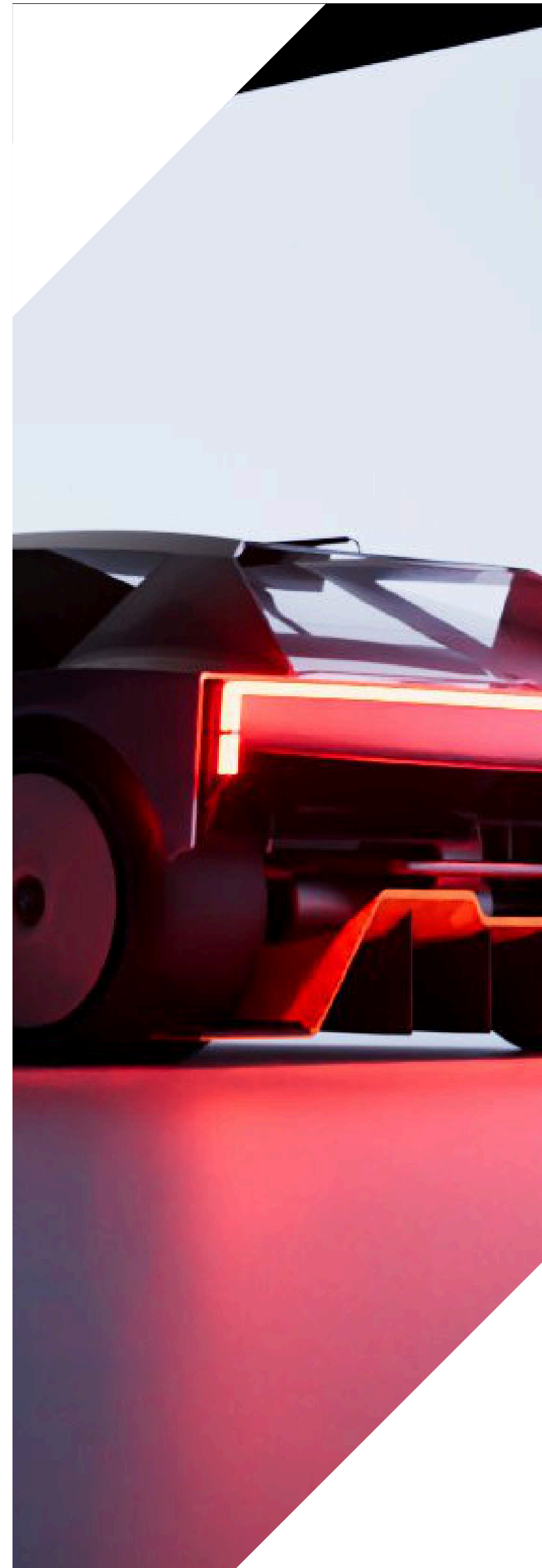




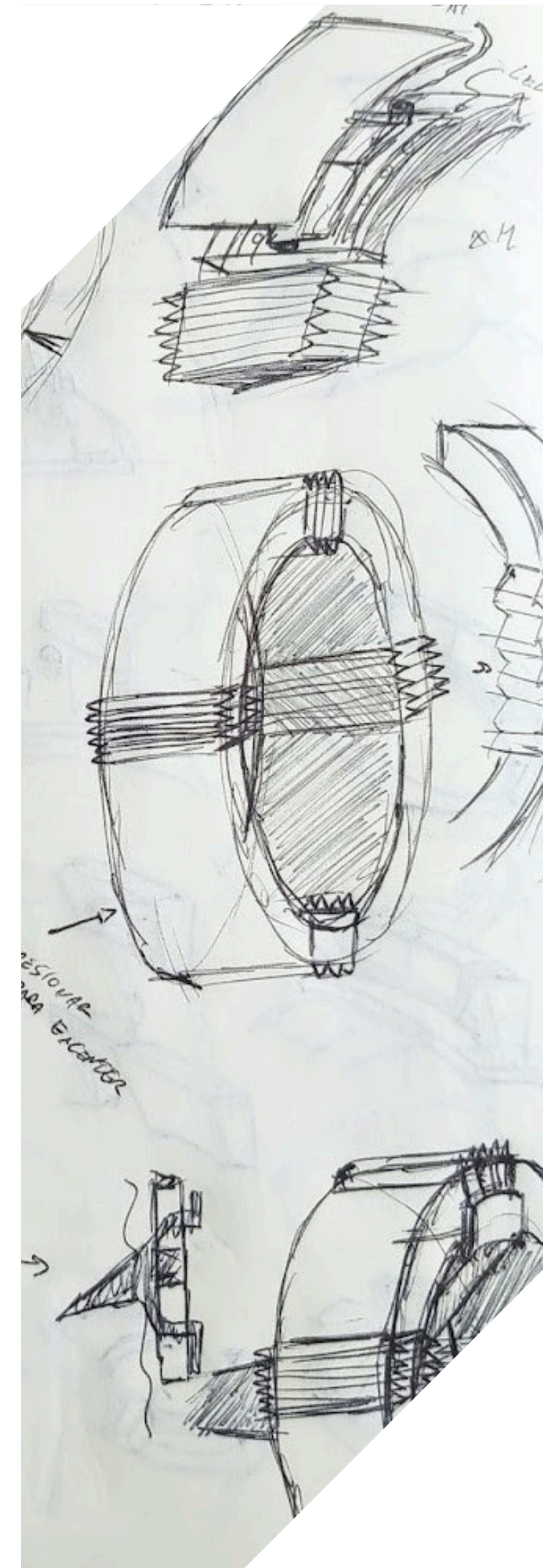
SEACLOPS



ROLBA



POLESTAR 18



SKETCHBOOK



PROTOTYPES



SEACLIPS (2021-22)

Seaclops brief

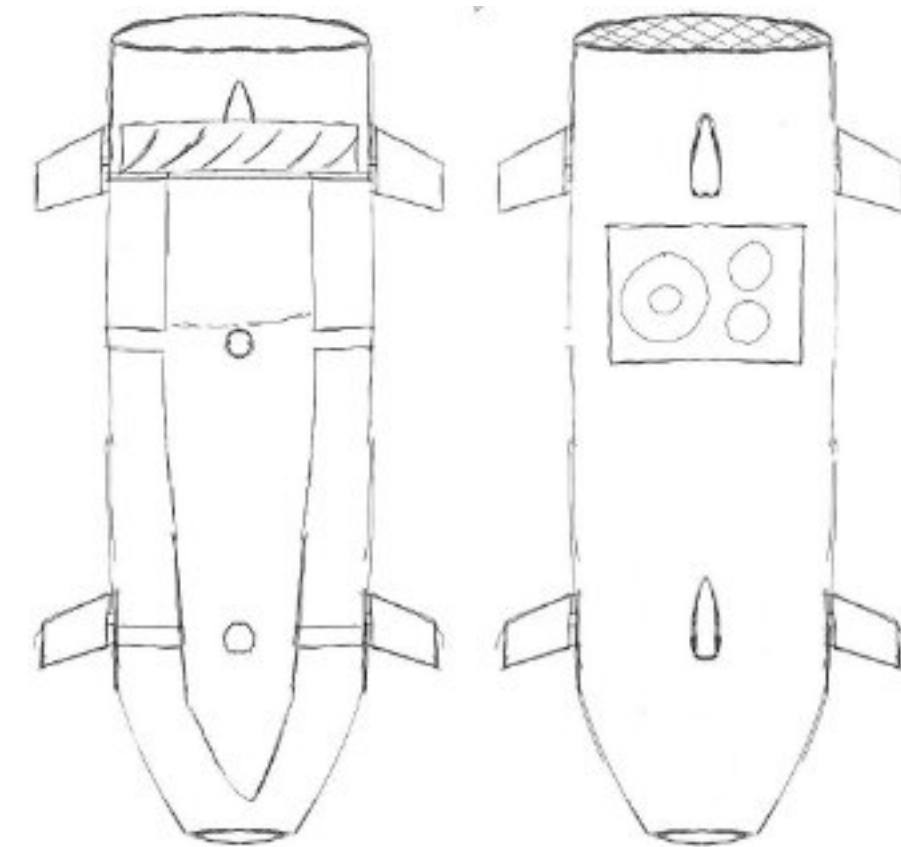
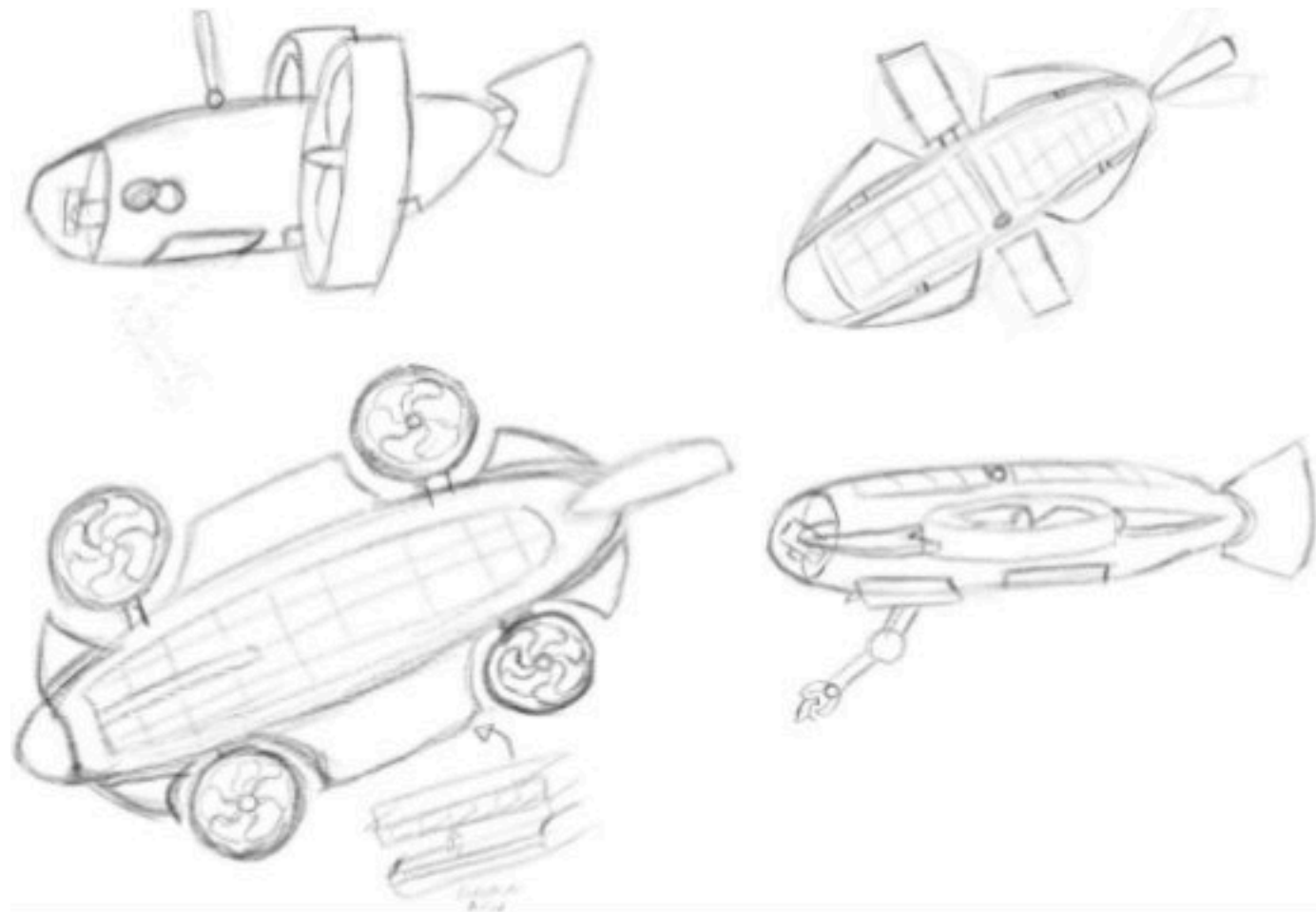
The design brief of this year long project was to work on pairs researching and developing a more concrete brief to design a drone or UAV and then separate ourselves to design two independent ideas that start from a common research.

We decided to design a marine unmanned vehicle with the main objective to study coral and other shall but risk environments. Another objective was to create the minimal impact possible, so it needed to be electric.



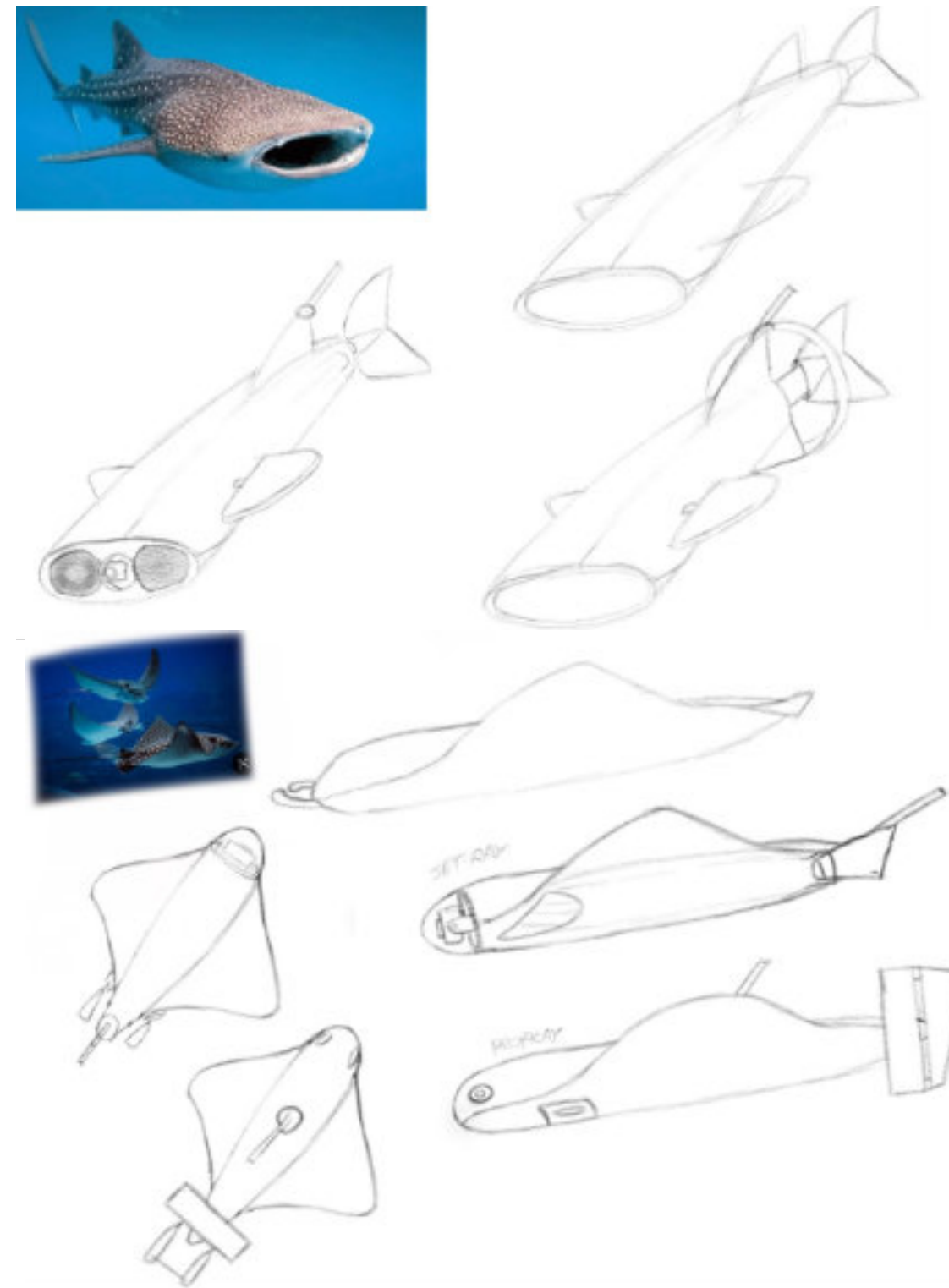
We decided to focus on a biophilic design, so the UAV didn't appear as such an alien object to the environment. To achieve this, we split up to brainstorm various designs, I focus on different animals.

Ideation sketches



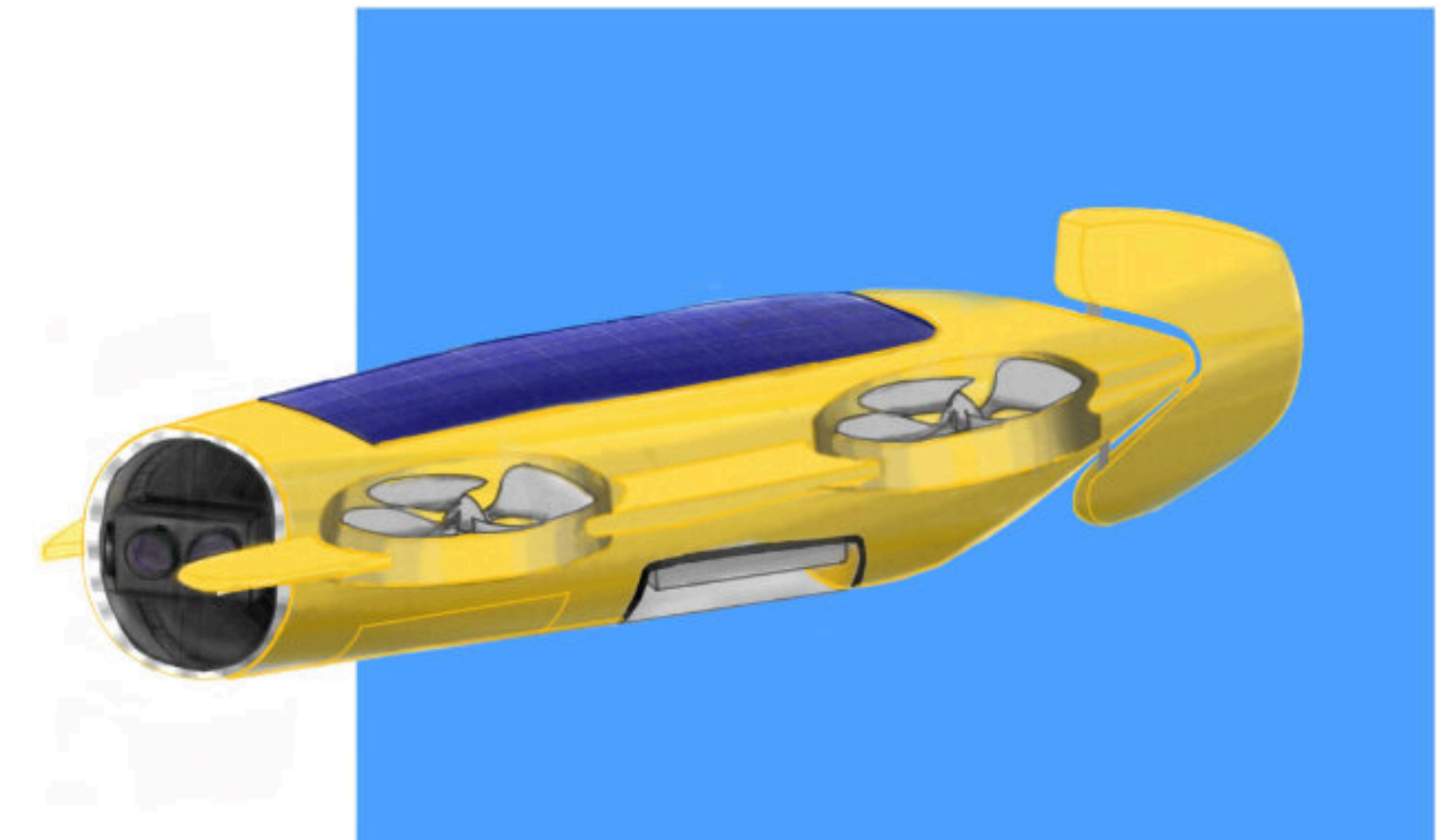
At first I also made some more technical designs, to see what basic elements could be needed to function.

Some design inspired on stingrays, it obtained the decision to create a hybrid propulsion system with a fin based movement for short distances and a jet like propulsion for long ones.



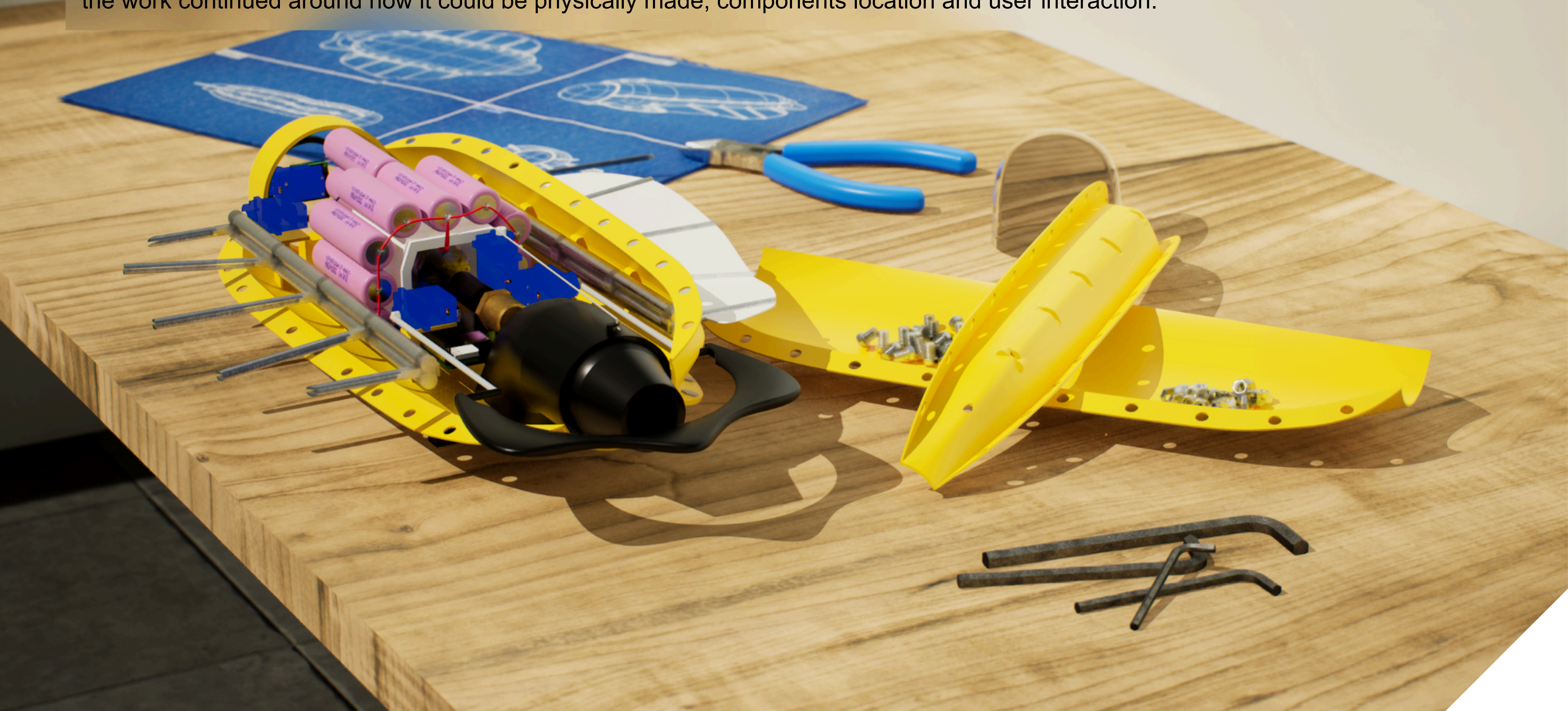
Designs inspired on whale sharks, with the mouth as a way to mimic the jet entry

This designs are inspired on the prehistoric being Opabinia, that due to a more compact width in comparison to the stingray, I decided to continue this path for the final design.

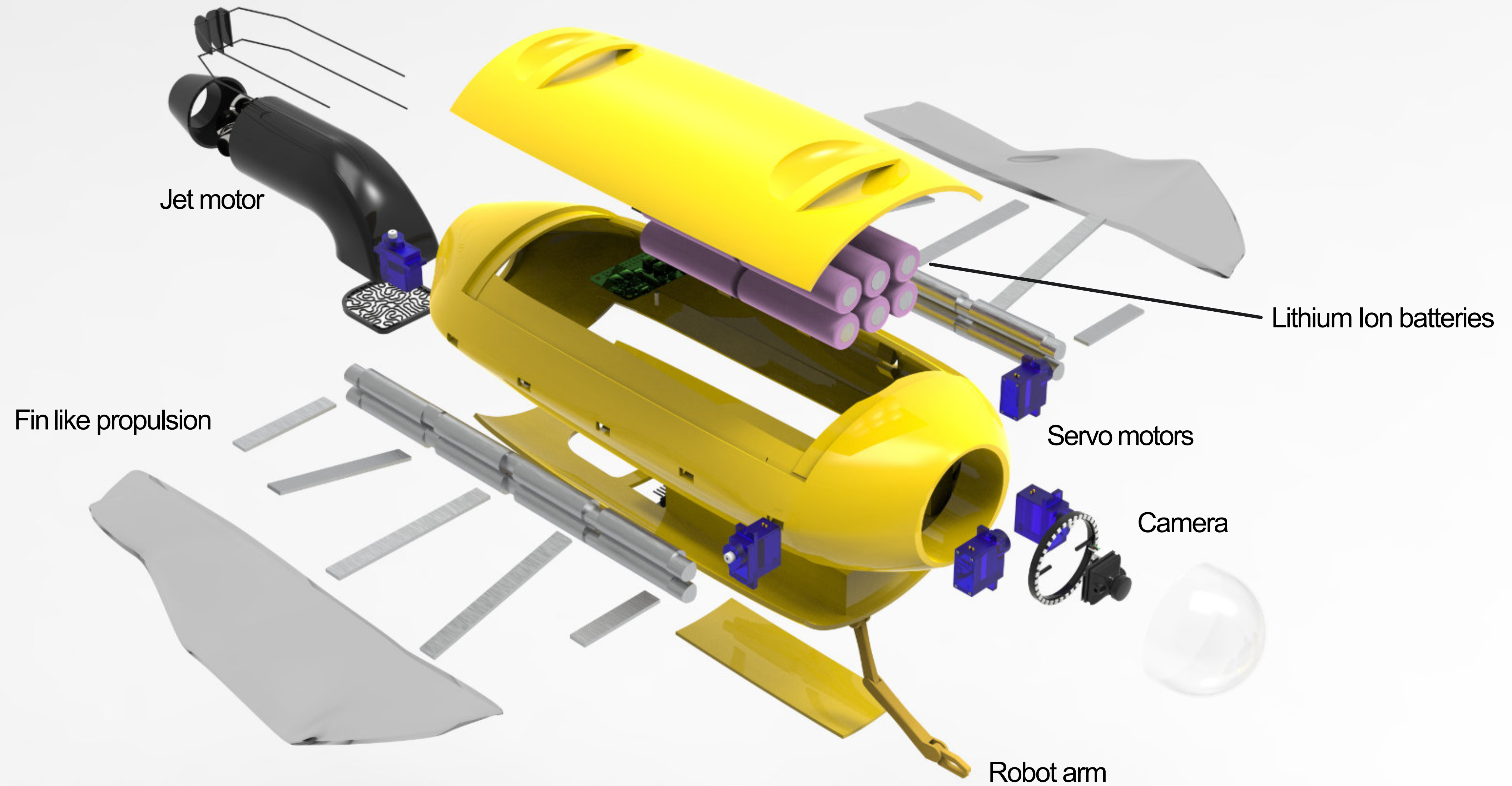


Ideation 3D models

Once a design was decided a iteration and evolution process began, the first models were rudimentary to research an approximate aqua-dynamic design, at the same time, work developing how the fin movement could work took place. Once this process was finalised, the work continued around how it could be physically made, components location and user interaction.



Exploded diagram



Prototype



Also, for the presentation of the project, I decided to create a 1:1 mock up of Seaclops, at first I created a foam prototype to check the proportions and as a mould for thermoforming, that due to the model's size I needed to create a provisional one, but as I used heat-guns to heat up the plastic films unevenly making bad result, due to this, the mock up was made by 3D printing. The fins were made with silicon with some aluminium inserts that work as the bones and connection to the body. Finally, with a vinyl cutter I created the name stickers.

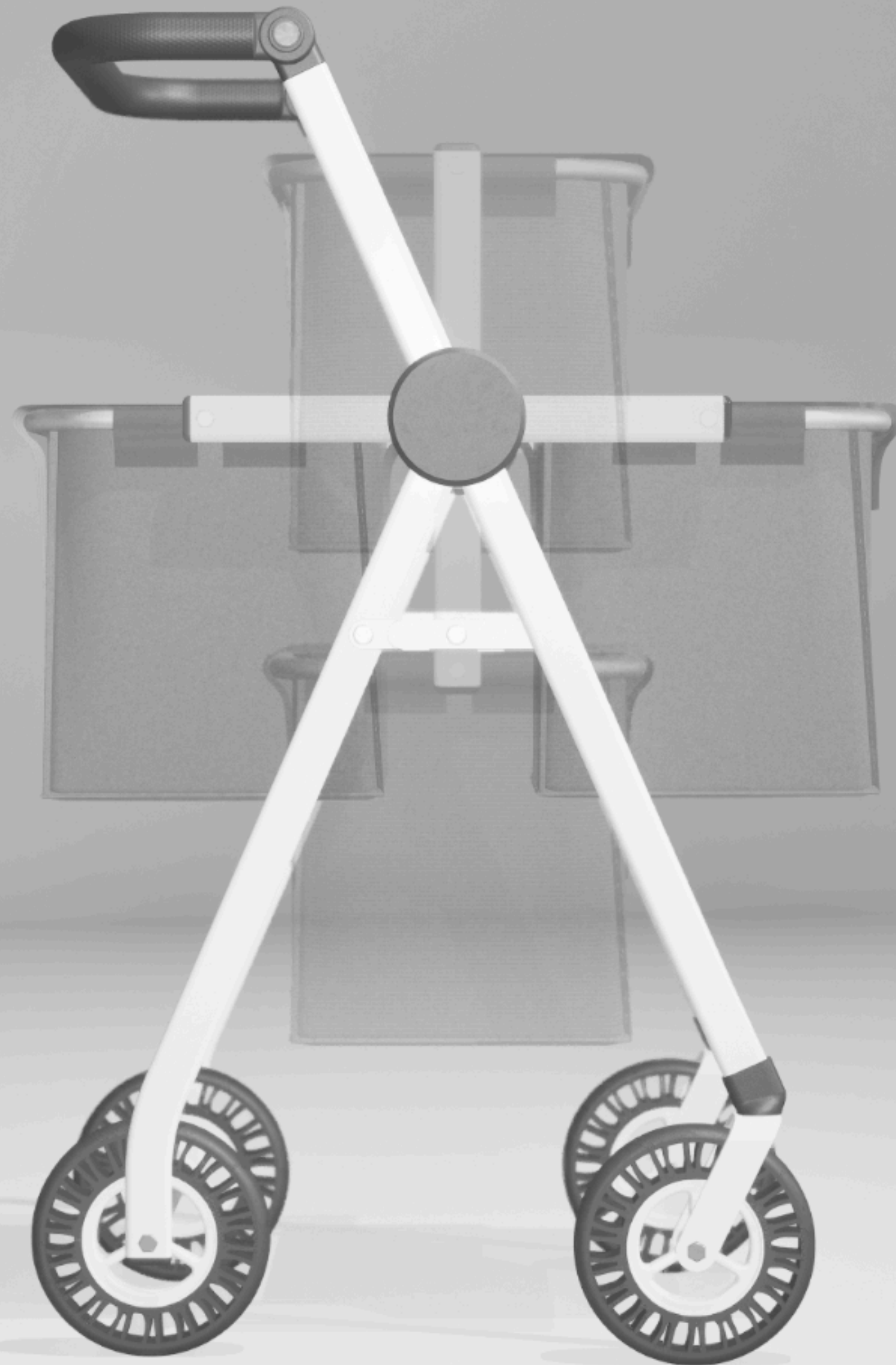


At the end of 2023 I developed a short demo of how the Seaclops vehicle could work.

It can be downloaded from [Itch.io](https://itch.io)

ROLBA

(2022-2023)

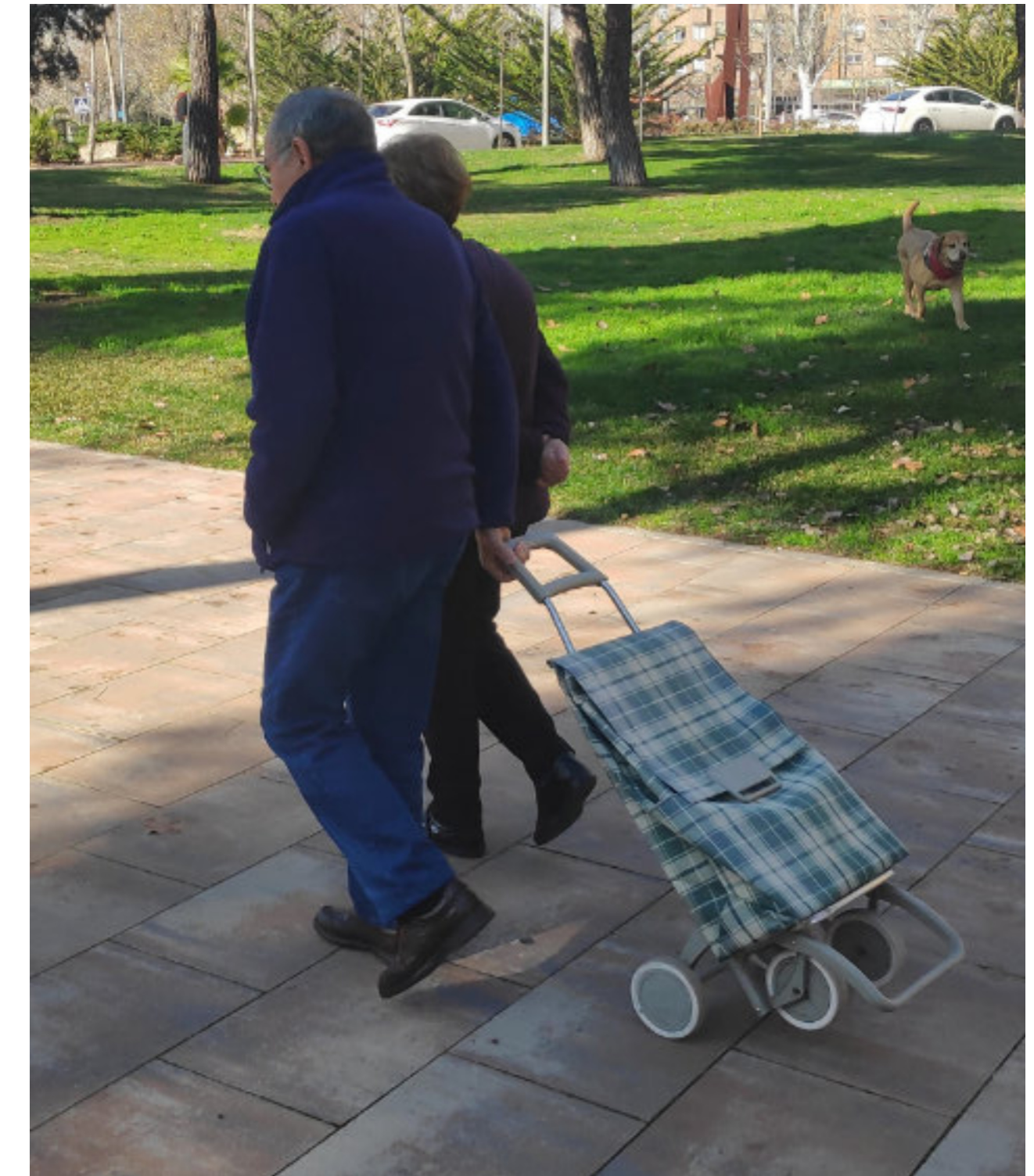


SHOPPING CART FOR THE ELDERLY

ROLBA BRIEF

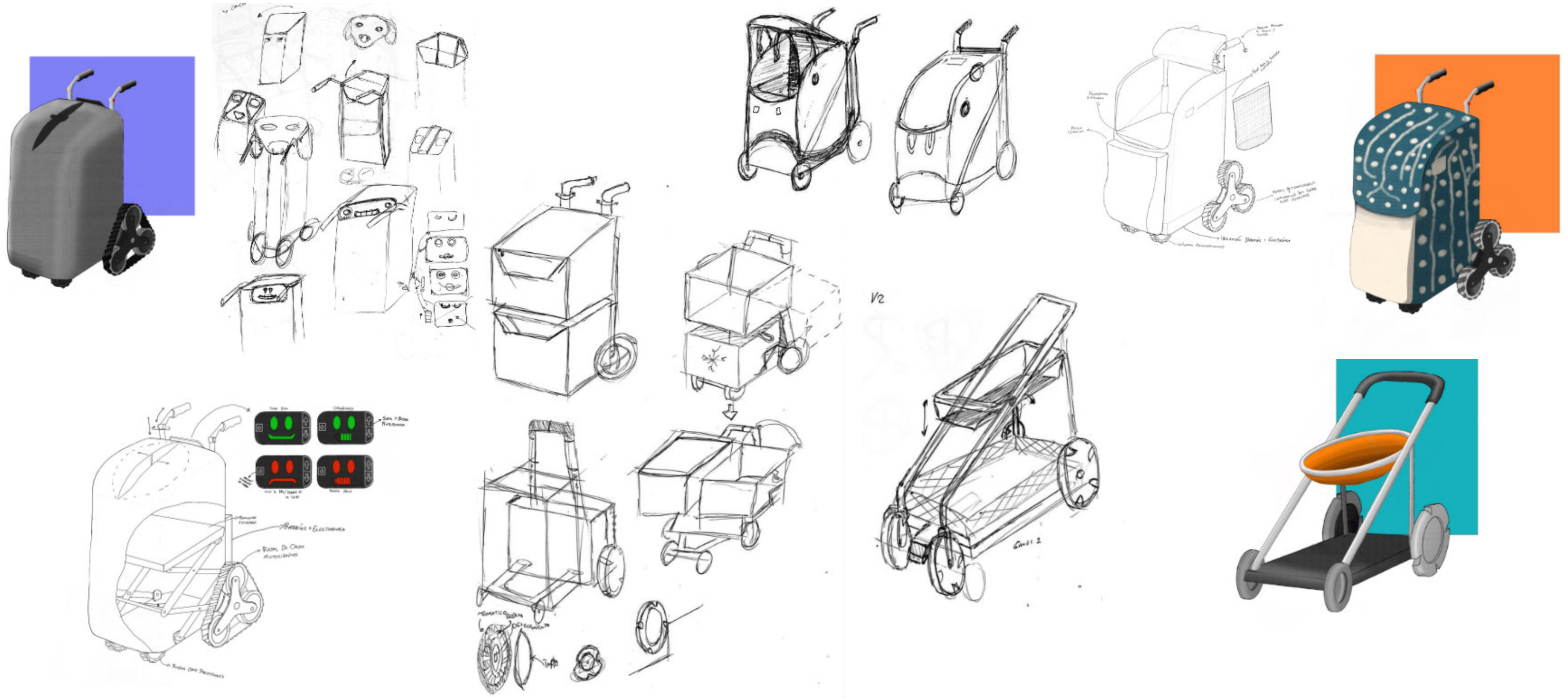
There are more and more independent older people, but not all of them maintain mobility, specially when carrying out demanding task such as carrying the groceries. Personal shopping carts already exist, but characteristics such a low handlebar or the need to bend down to extract the last elements make them not really friendly for the ageing population.

That is way, for my final project at university I choose to create a shopping cart that could tackle this issues and could improve how they carried out this daily task. Other characteristics I need to take account for are: It should be lightweight, as the heavier the product is, is harder to push, to be affordable, I wanted that as much people as possible to access it, and as low tech as possible, reducing the complexity of the final product.



CONCEPTS

Once the brief and the research was made, the ideation and brainstorm for solutions started, resulting on a large collection of sketches, here is a selection of them, although some are from later stages of the project, where sketching was used to visualise ways to solve more specific problems such as unions, folding and storage or interaction.



SCALE PROTOTYPES



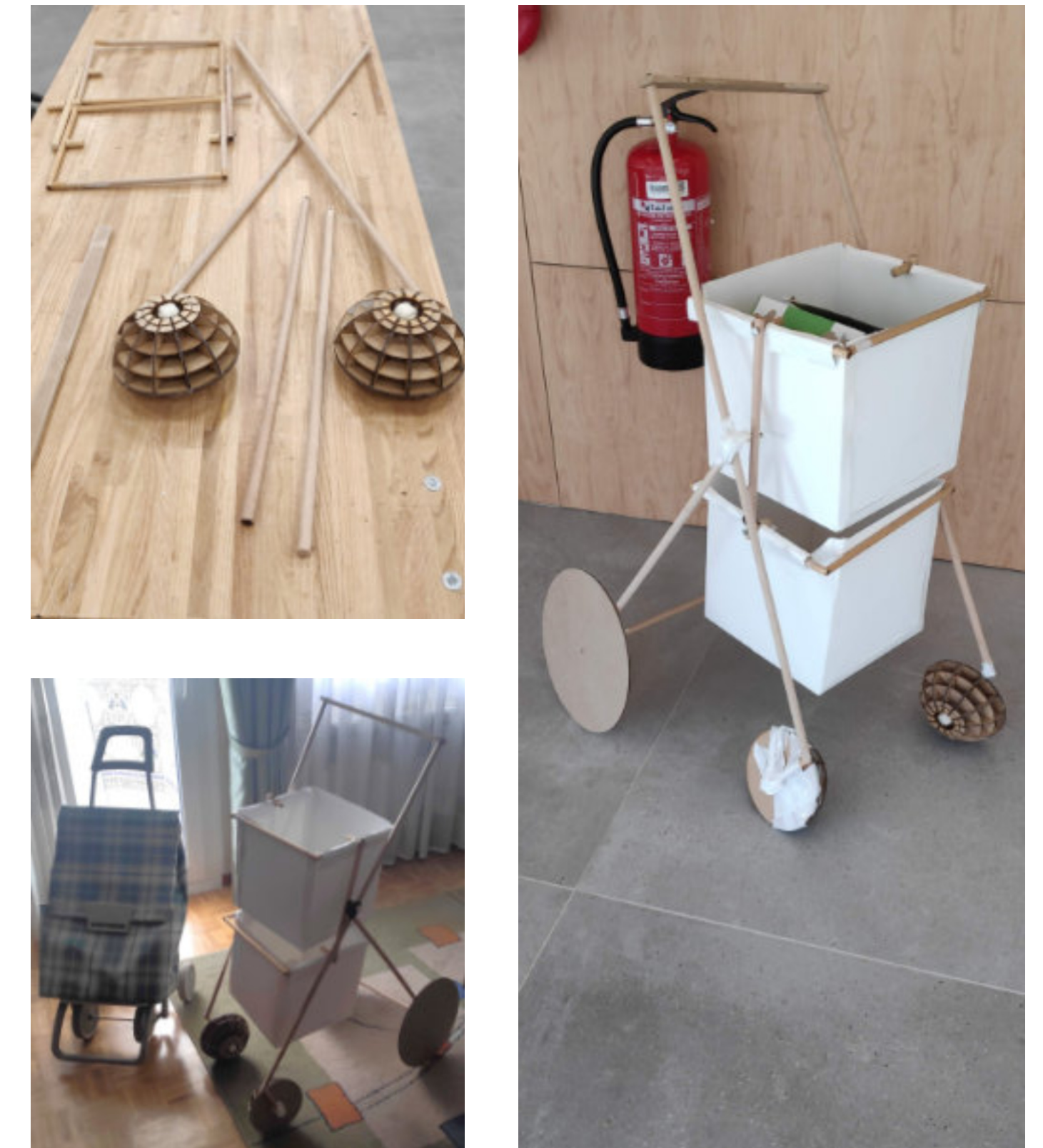
While the sketching process I also created some fast scale prototypes with scrap to evaluate how the design could be seen in 3D.

MOVEMENT PROTOTYPES



Later in the project I wanted to try some other movement ways, highlighting a concept of ball wheels which I created on a real size wood structure to test how it would move.

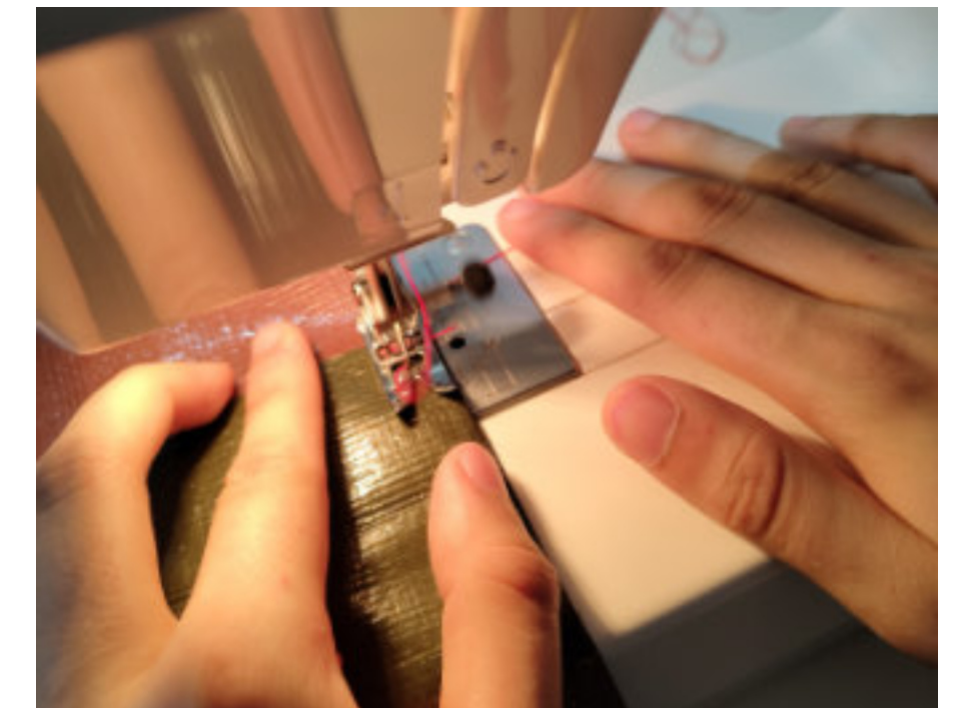
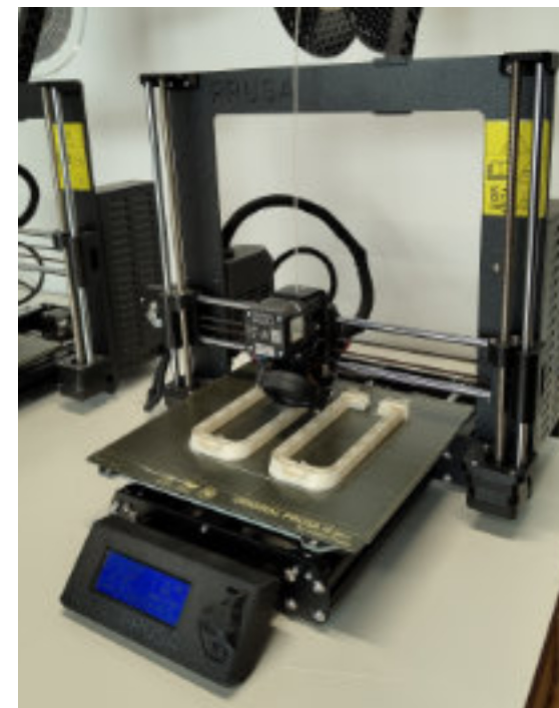
ALPHA PROTOTYPE



Once I had a selected design I created an Alpha prototype with some wood to preview the measurements, also to check the usability I tested and compared with a competitor cart with the help of target users.

BETA PROTOTYPE

With a decided design, a new prototype was built, with a more refined finish, looking to reassemble how the final product would look like. The main difference in the prototype was using a wooden chassis, this was mainly due to facility to obtain and work with wood compared to polypropylene. The chassis was milled using a CNC milling machine and then covered with a satin vinyl to approximate the final finish. The union pieces were 3D printed and the bag support was made folding aluminium tubes. The bags were made sewing polypropylene tarp.



The rubber wheels were made by milling a positive mould with the CNC and creating creating the container with laser cutting. Then a negative mould made out of silicone was made. Once the silicone mould was obtained, half a wheel could be made, once the first half was cured, the second half was made, and before it cures completely, the first half was deposited over it, joining both parts.



TESTING ROLBA

Once the second prototype was built, a test was carried out with some targeted users to evaluate the design, observe their interaction and feedback, note improvements and compare it's use with competitors of the market.

Some of conclusions obtained where that although the rotating basket look interesting, the size and composition of the wheels could be too big, specially once the cart is folded for its storage. Also some of the 3D printed parts and unions were compromised, compromising the rigidity of the prototype.



FINAL ITERATION

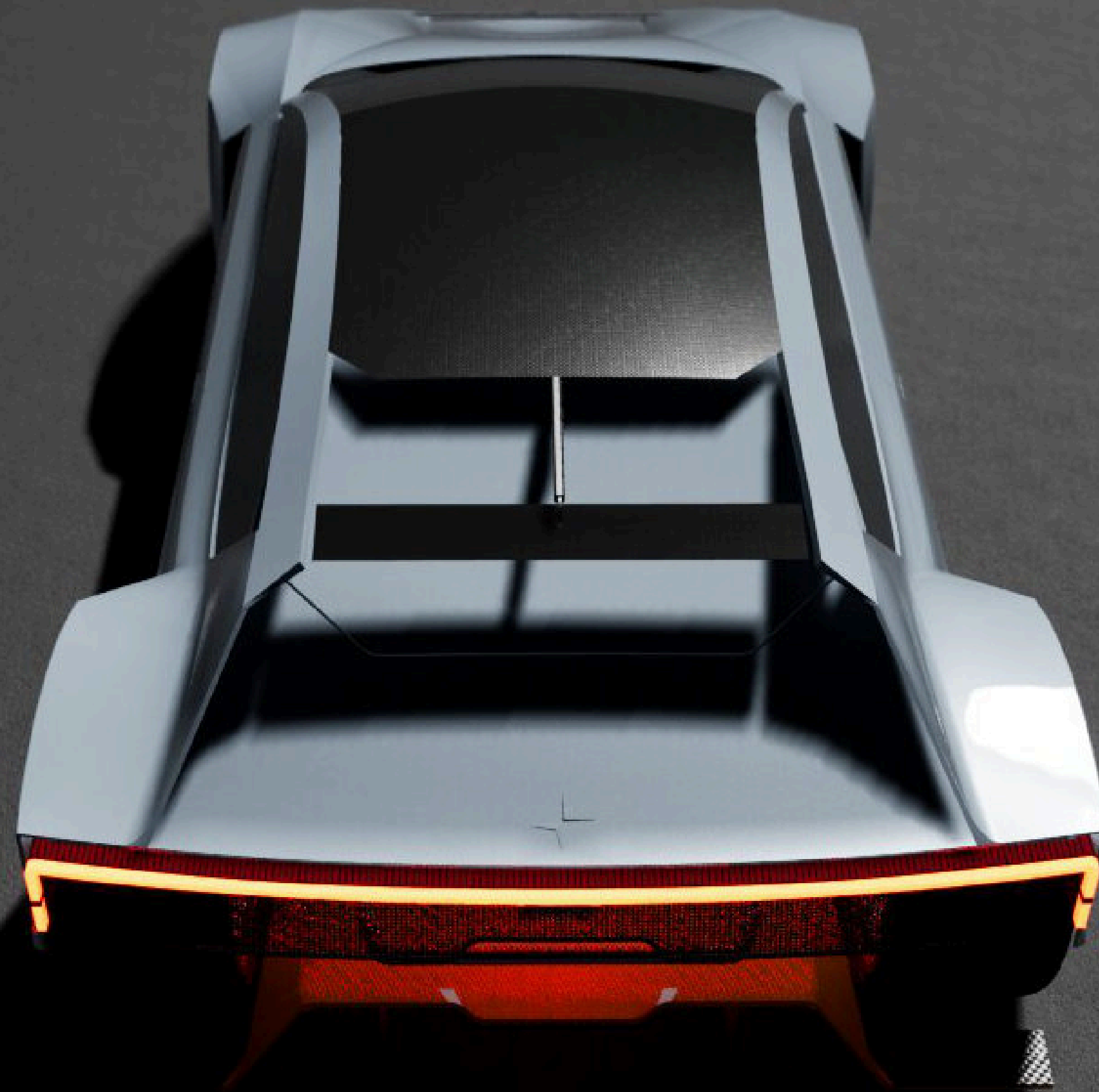
With the conclusions obtained from the prototype testing and feedback received, improvements were made to the design, such as smaller wheels, or an adjustable handlebar. In this evolution, Rolba customisation options are also shown, representing the different colours, patterns and bag uses such as an insulated one to transport products that need to stay cold or one made for small pets.





The full project can be accessed, in Spanish, from the following [link](#).

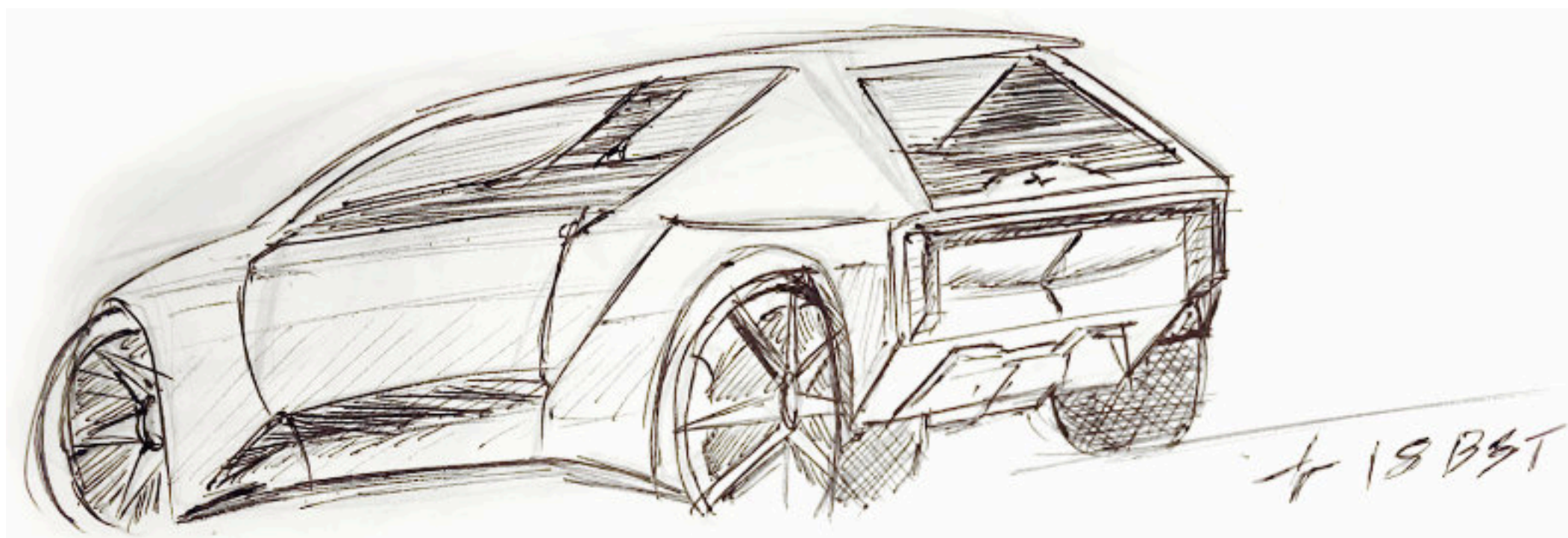
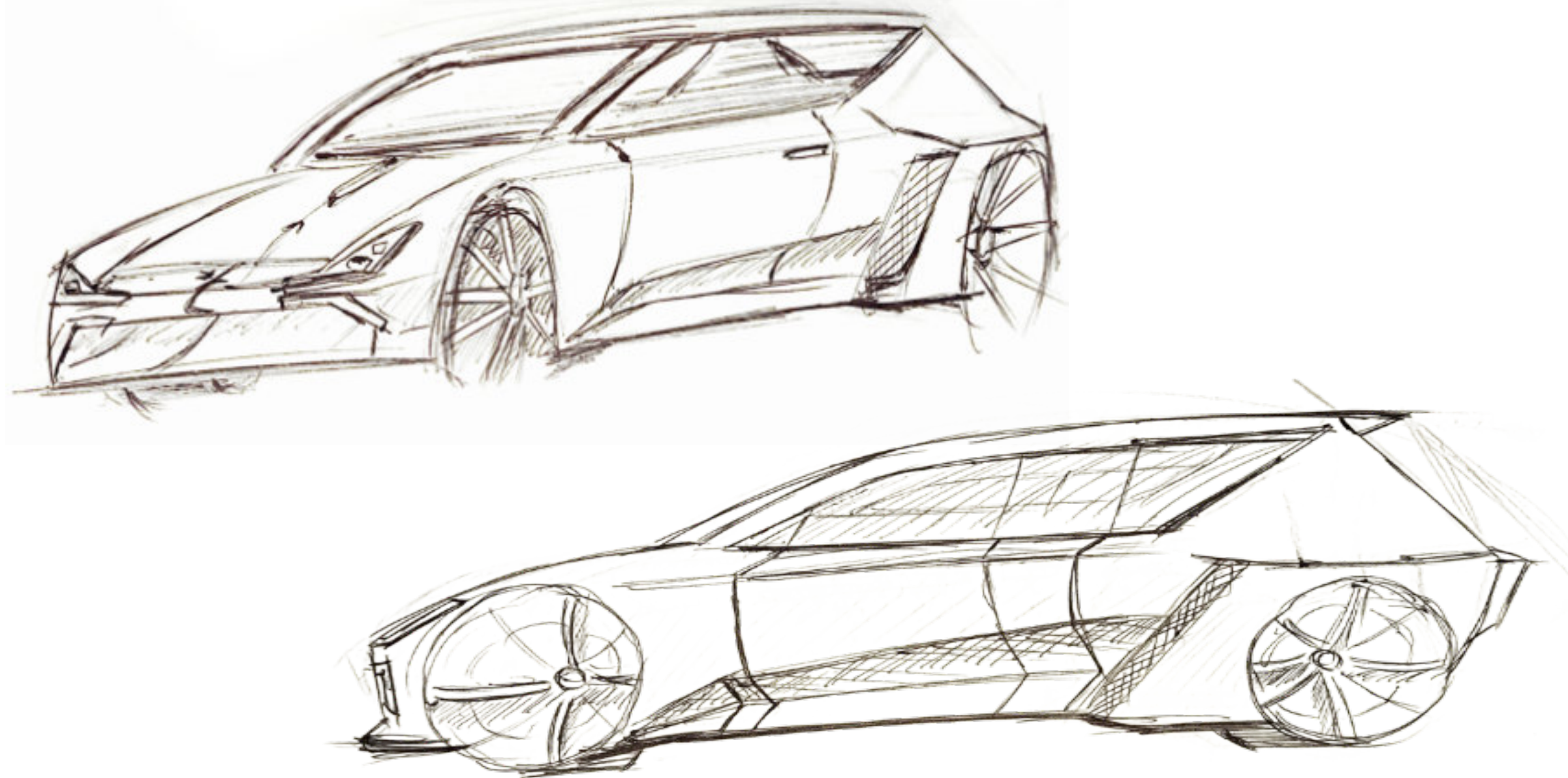
Polestar 18



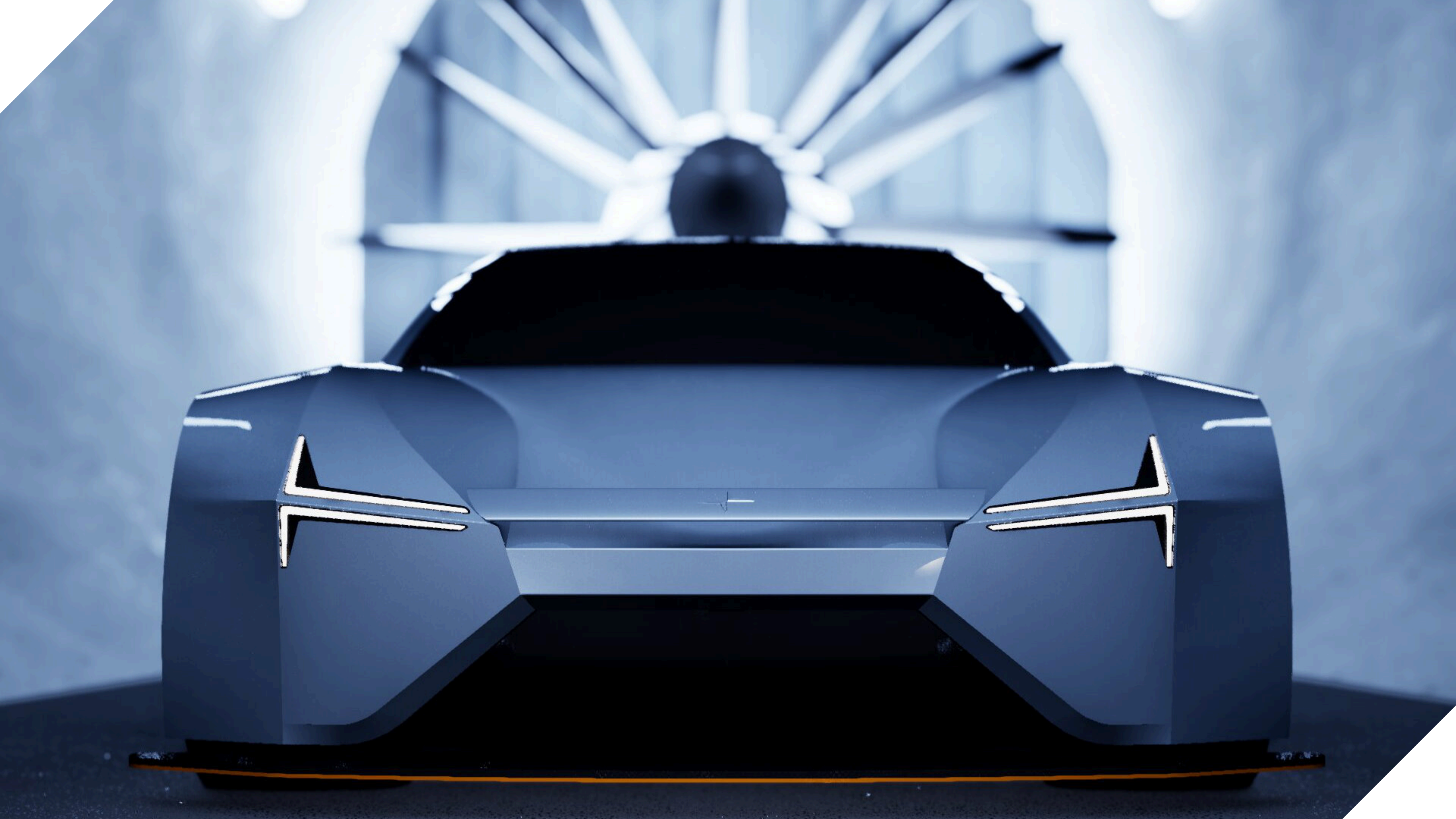
(2024)

Ideation Sketches

For the 2024 Polestar design contest the objective was to create a vehicle blending the Polestar DNA with the Hot Wheels philosophy.



To this end, I traced Polestar to it's origins as Volvo racing team where they raced TWR prepared 850 estate and then to the one of the first vehicles with the Polestar as the Volvo V60 Polestar. With this I focused on creating a extreme track focused shooting brake concept, with Hot Wheels philosophy mixed as exaggerations on the racing features such as the wing or the wheel arches.

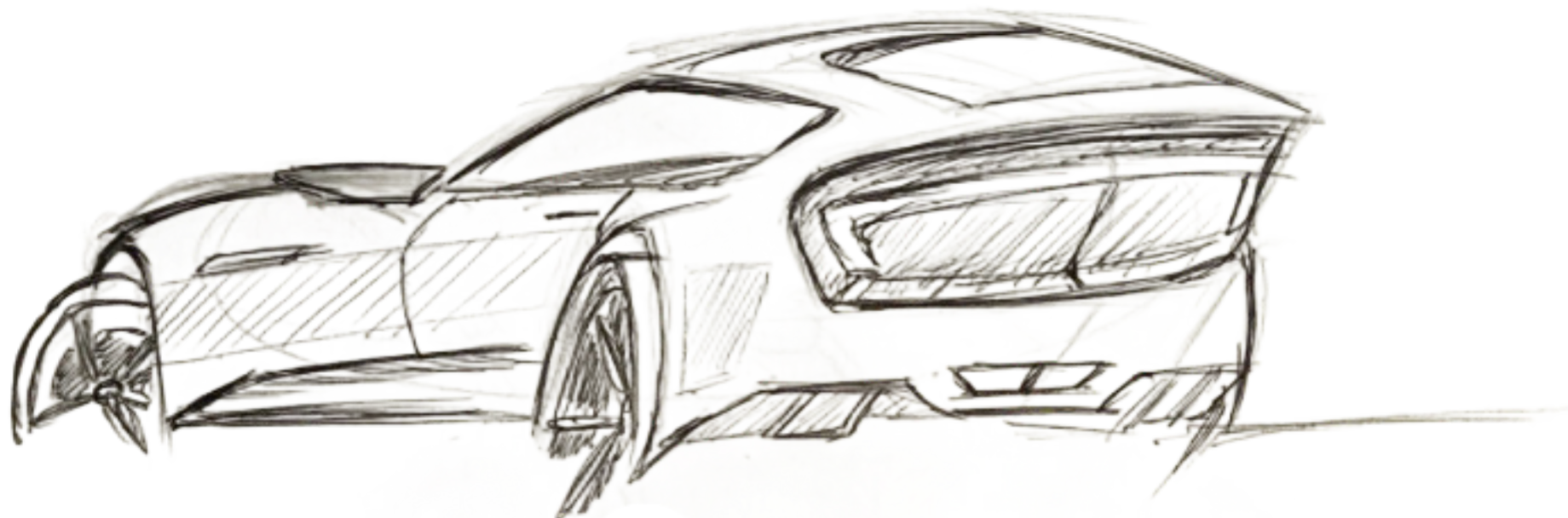
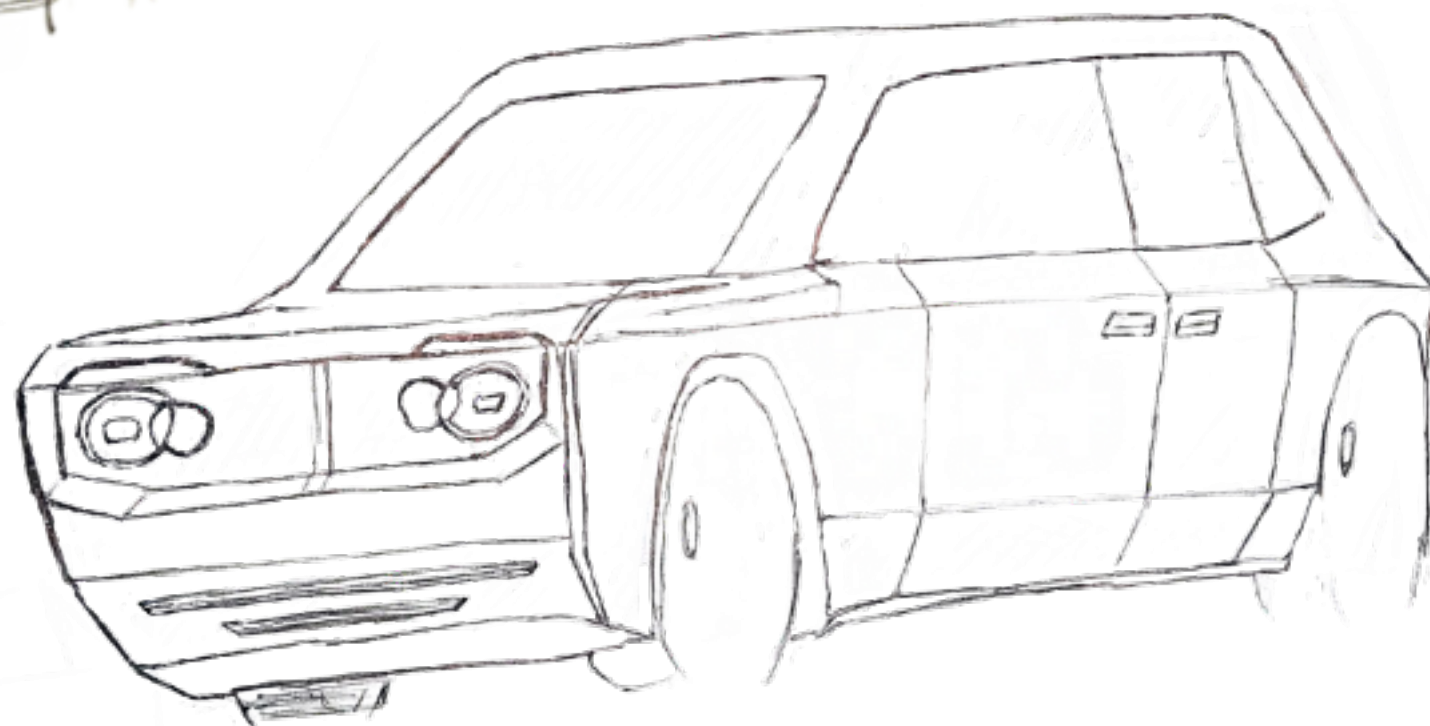
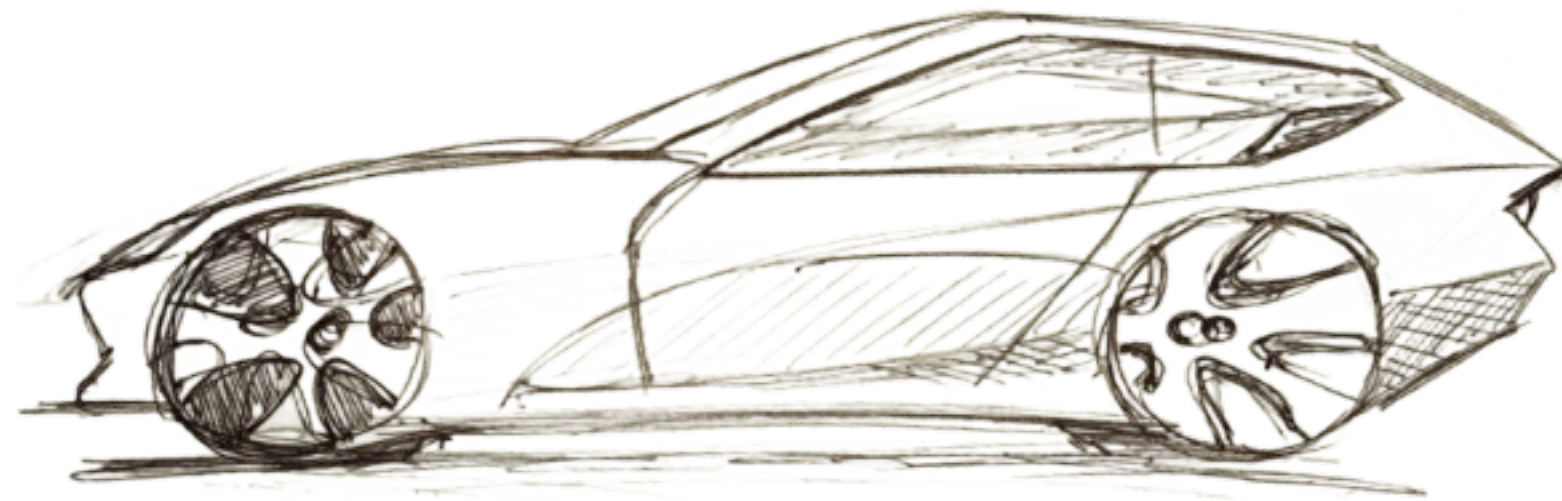






Project modelled in Rhino3D and rendered in Twinmotion

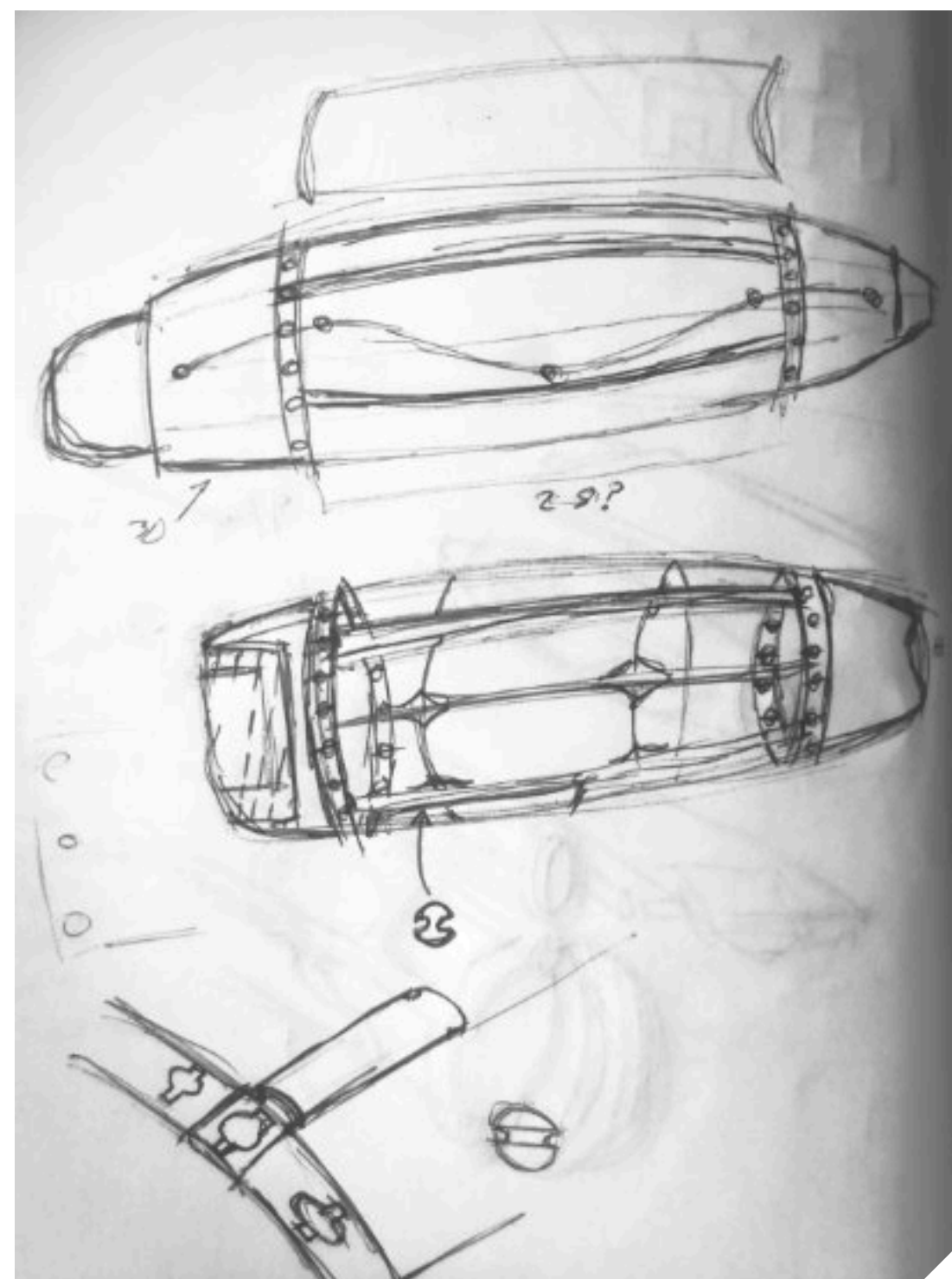
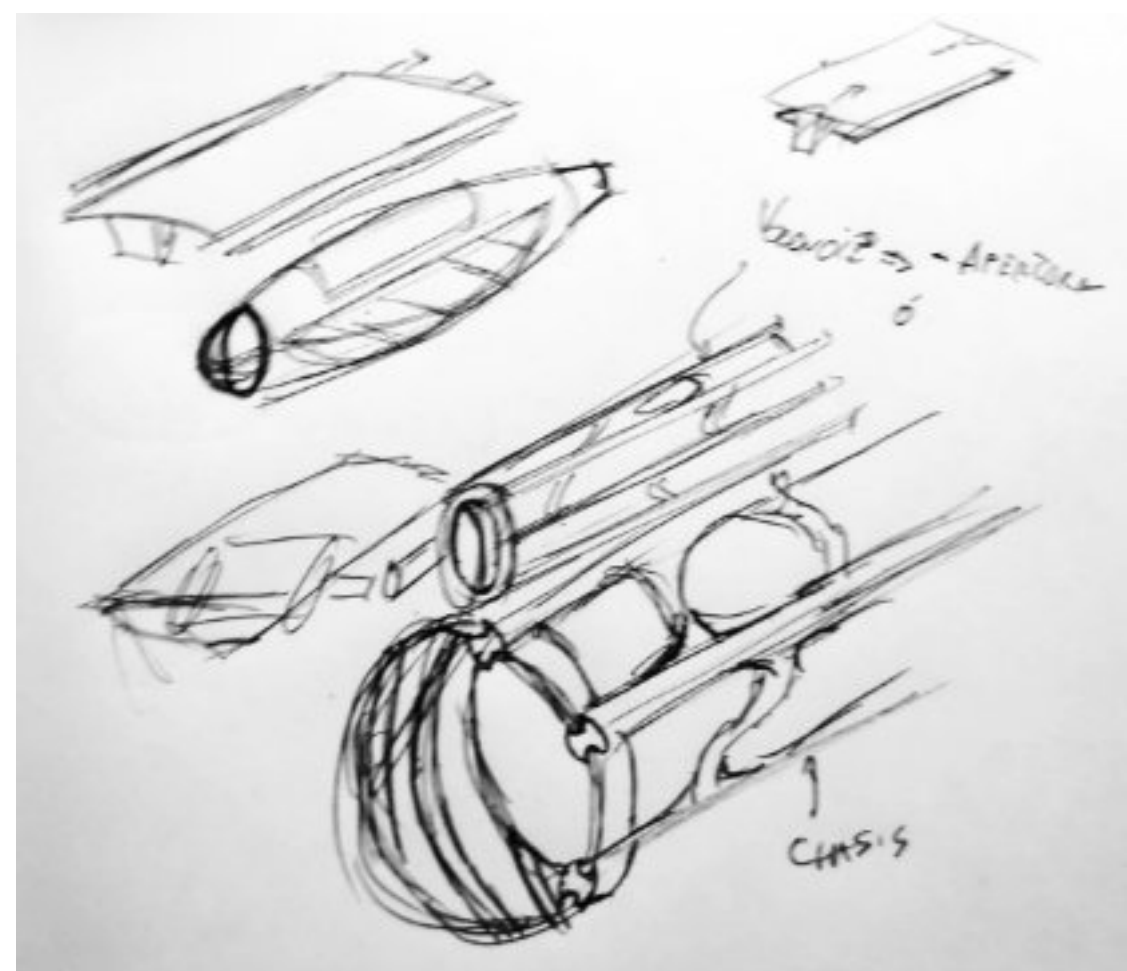
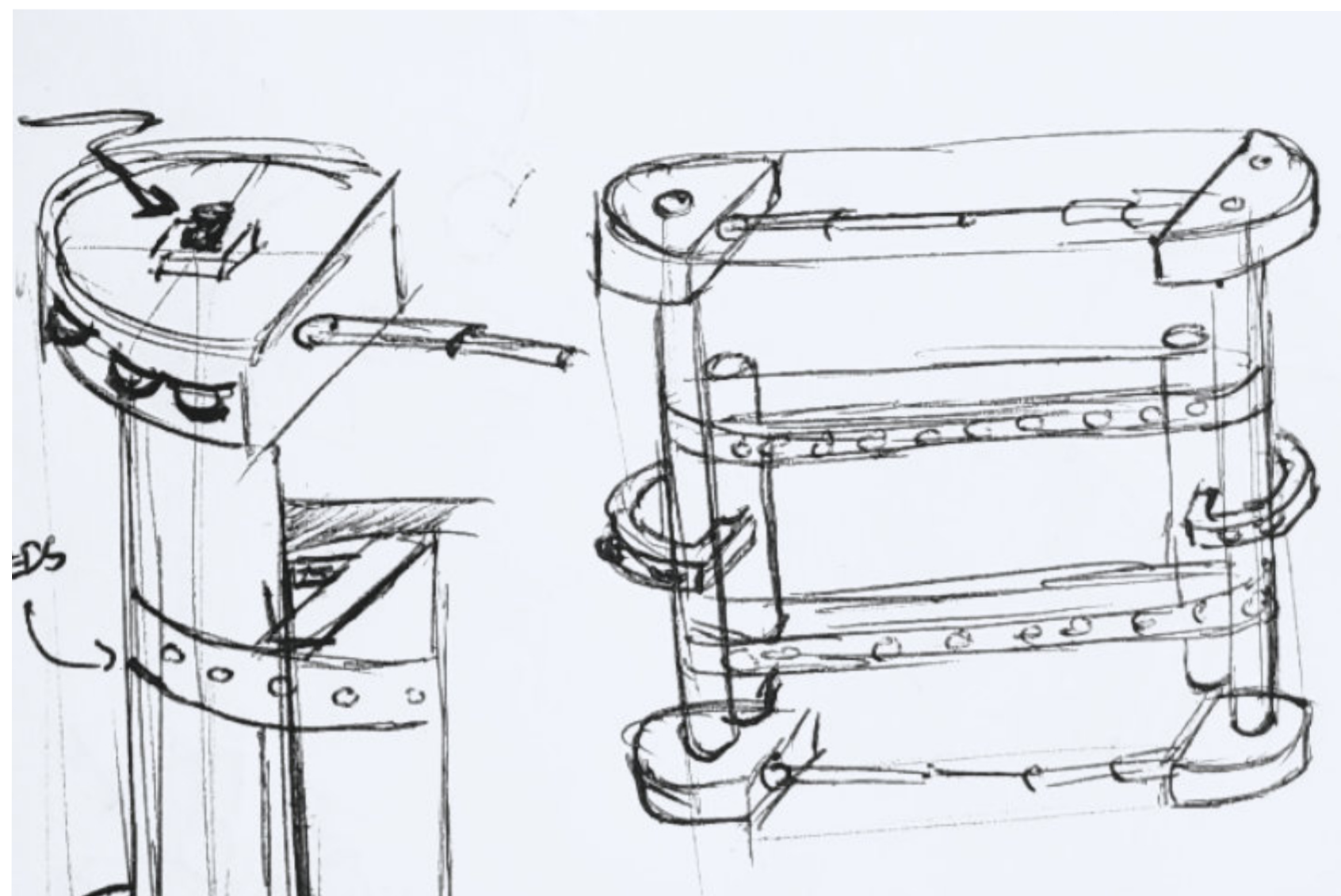
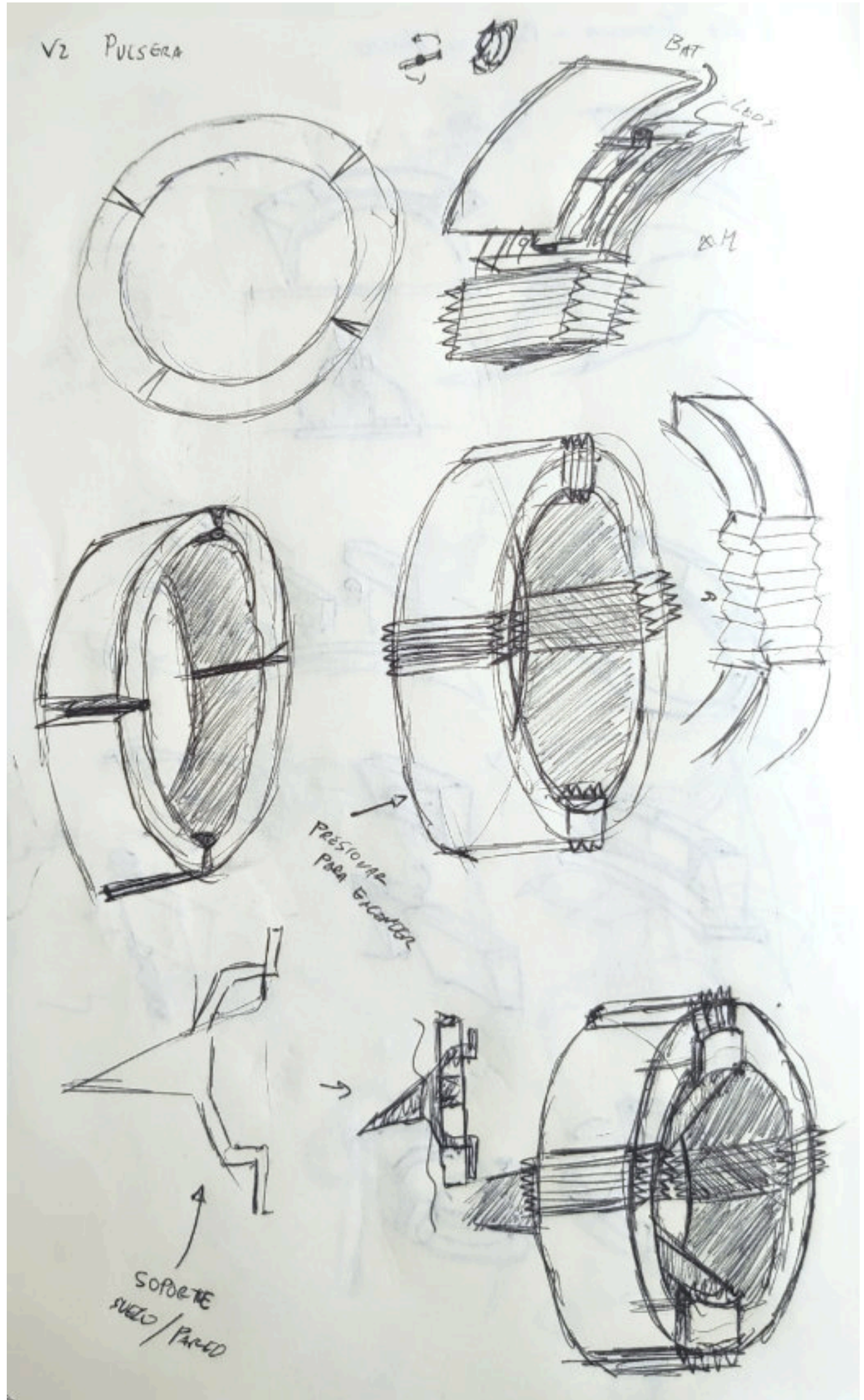
Sketchbook



Vizcom Assisted Redndering

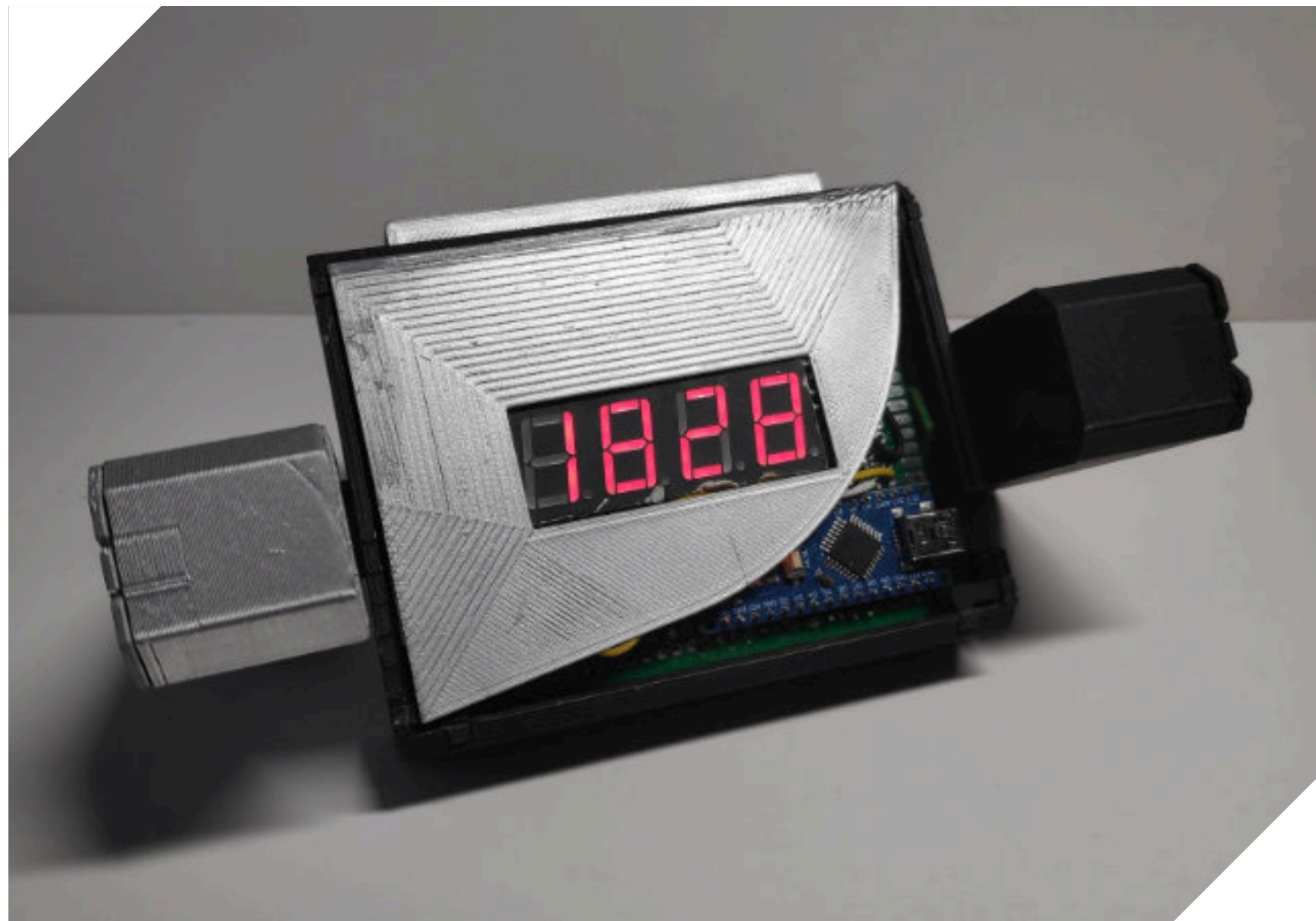


Vizcom Assisted Redndering



Prototypes

Thanks to the university workshop and my later working experience in it, I've been able to try diverse prototyping techniques both on university projects and for more personal ones.



Working alarm clock made with 3D printing and Arduino



3D printed watch re-purposing an old watch mechanism and glass



Clay 3D printed vase modelled in the Grasshopper add-on of Rhinoceros



The following prototype is a 1:24 clay mock-up on an ongoing project for a retro inspired hatchback. Some sketches of this projects can be found on the sketch section.

The following prototype was made as a way to experiment with diverse materials and techniques such as carbon fibre for the body, a mix of silicone and tyre dust for the wheels and resin for the rims.



Let's keep in touch

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