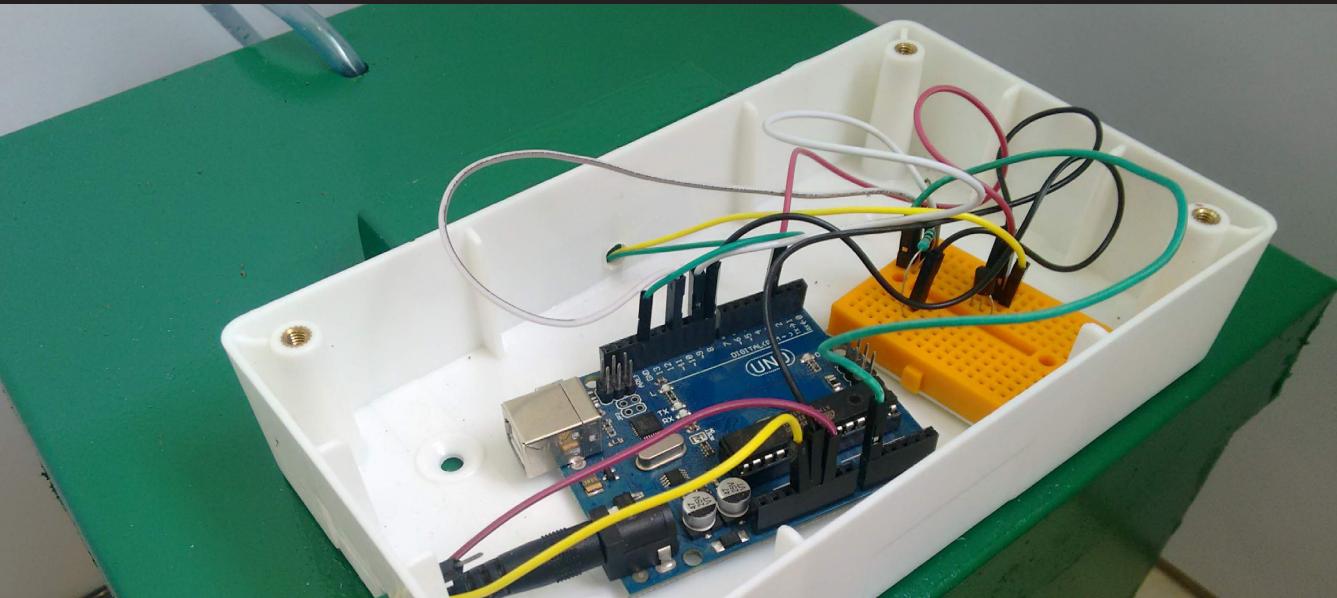


Eureka

Automated Watering Assistant



Why Automate Watering?



Conerves Water

Convience of automating
mundane tasks



Existing Products



IKEA PS FEJÖ Self-watering Planter

This product relieves the user of watering their plants every day by using a mechanism which involves using threads to suck water from the bottom of the pot to the soil because of the lower content of water in the soil.

Advantages:

Caster wheels make it easy to move

Reasonable cost (\$20)

Made of recyclable material

Water gauge indicates the water level

Disadvantages:

Not ideal for the outdoor environment

No effective way to drain excess water



GrowOya

This product is a terracotta pot that can be buried into the soil and filled with water about once a week. The water inside slowly seeps out through the walls to water the plants at the roots.

Advantages:

Saves water and time

Reduces weed growth

Plants get how much water they need

Material and development process is not hazardous to the environment

Disadvantages:

Expensive (\$25 for 1 small product which is sufficient for 2 feet diameter)

Difficult to install

Breaks at temperatures below zero if left in the soil



Rainbird Drip-Irrigation System

This product controls water flow to a set of plants through a pipe laid across the area that has to be watered. This method allows water to seep into the soil, providing sub-surface watering.

Advantages:

Saves water compared to usual watering

Better growth of plants

Does not require digging

One time set-up

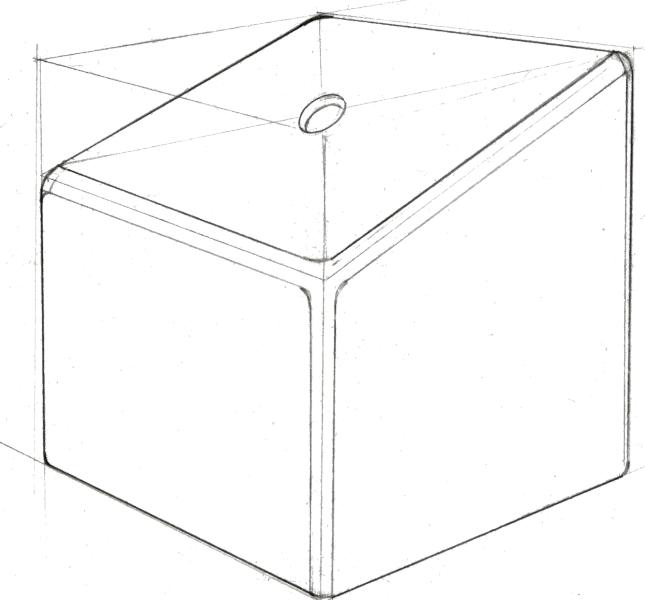
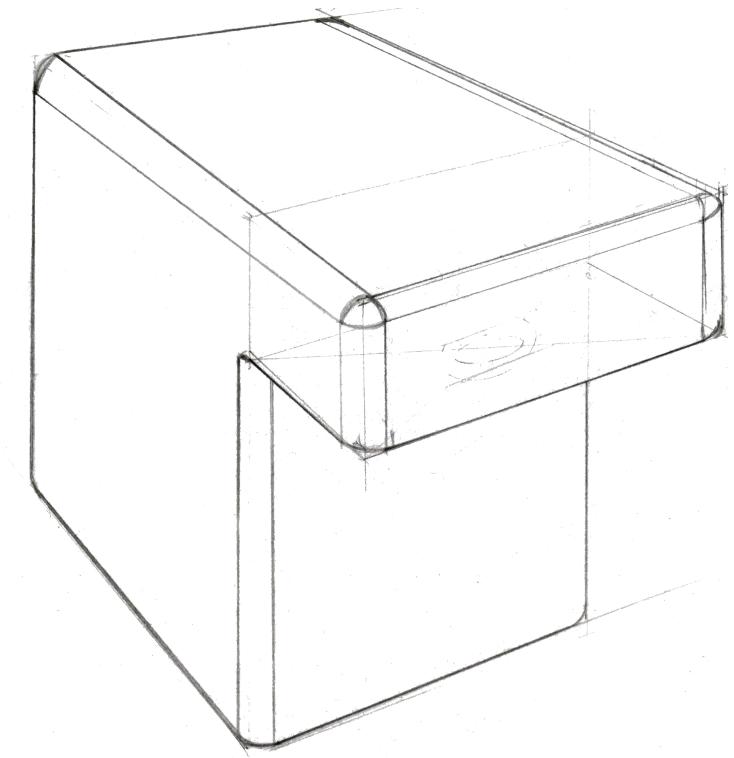
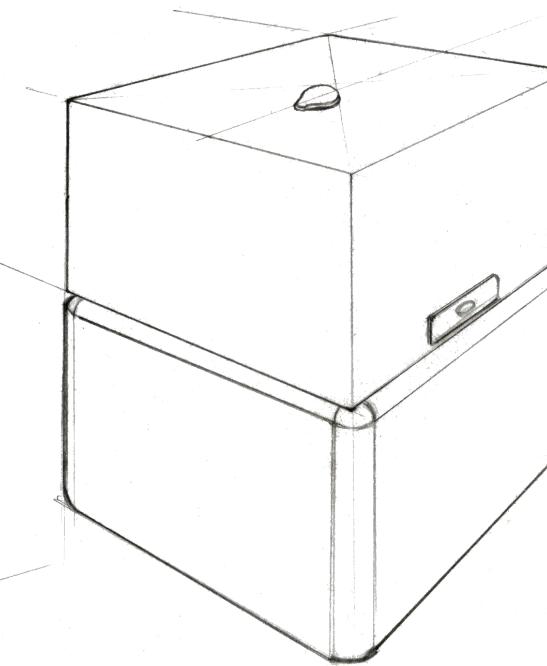
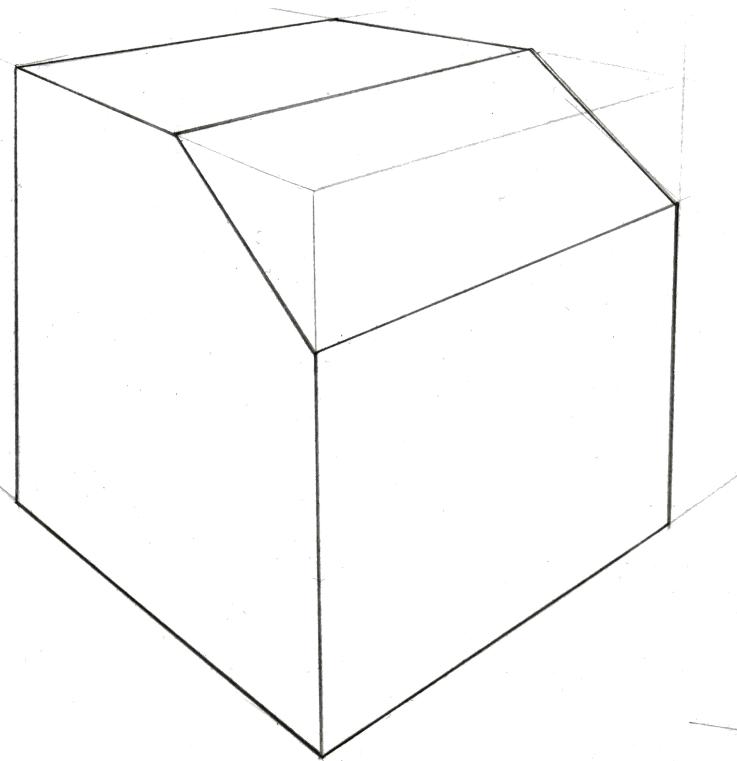
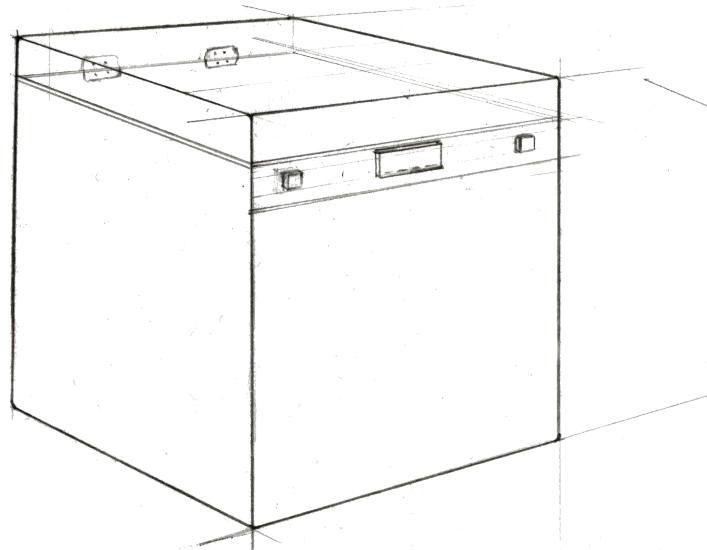
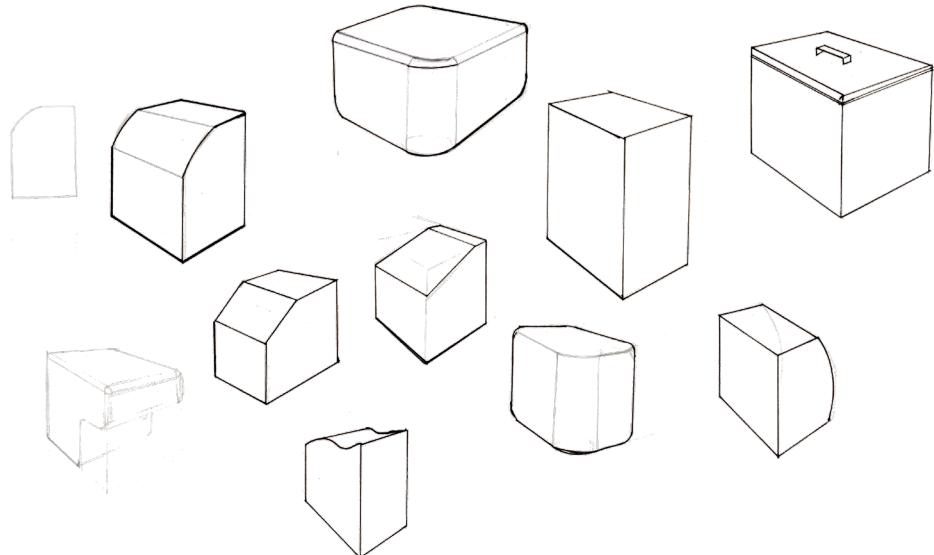
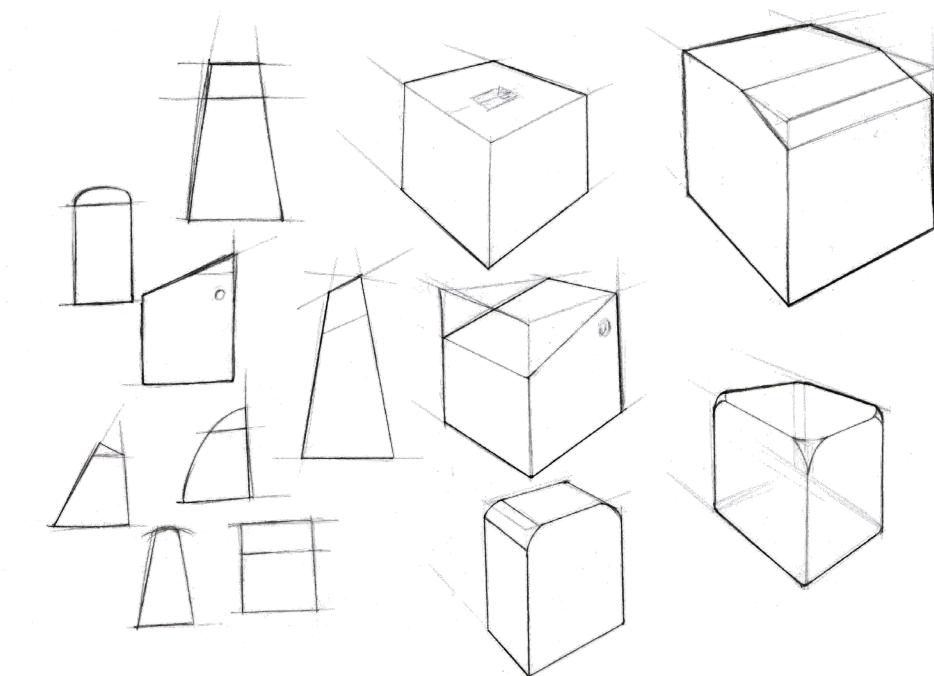
Disadvantages:

Requires a constant pressurized water supply

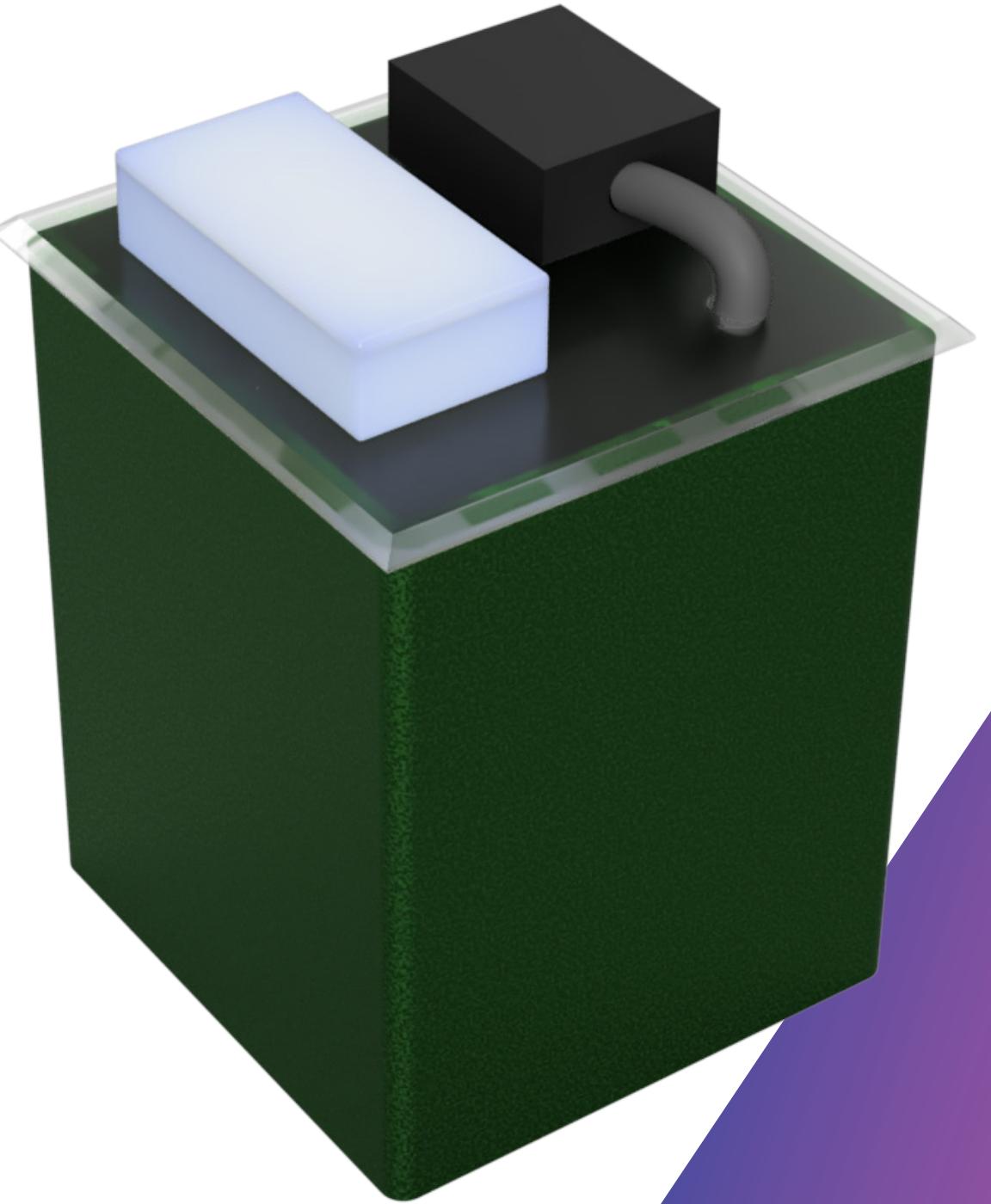
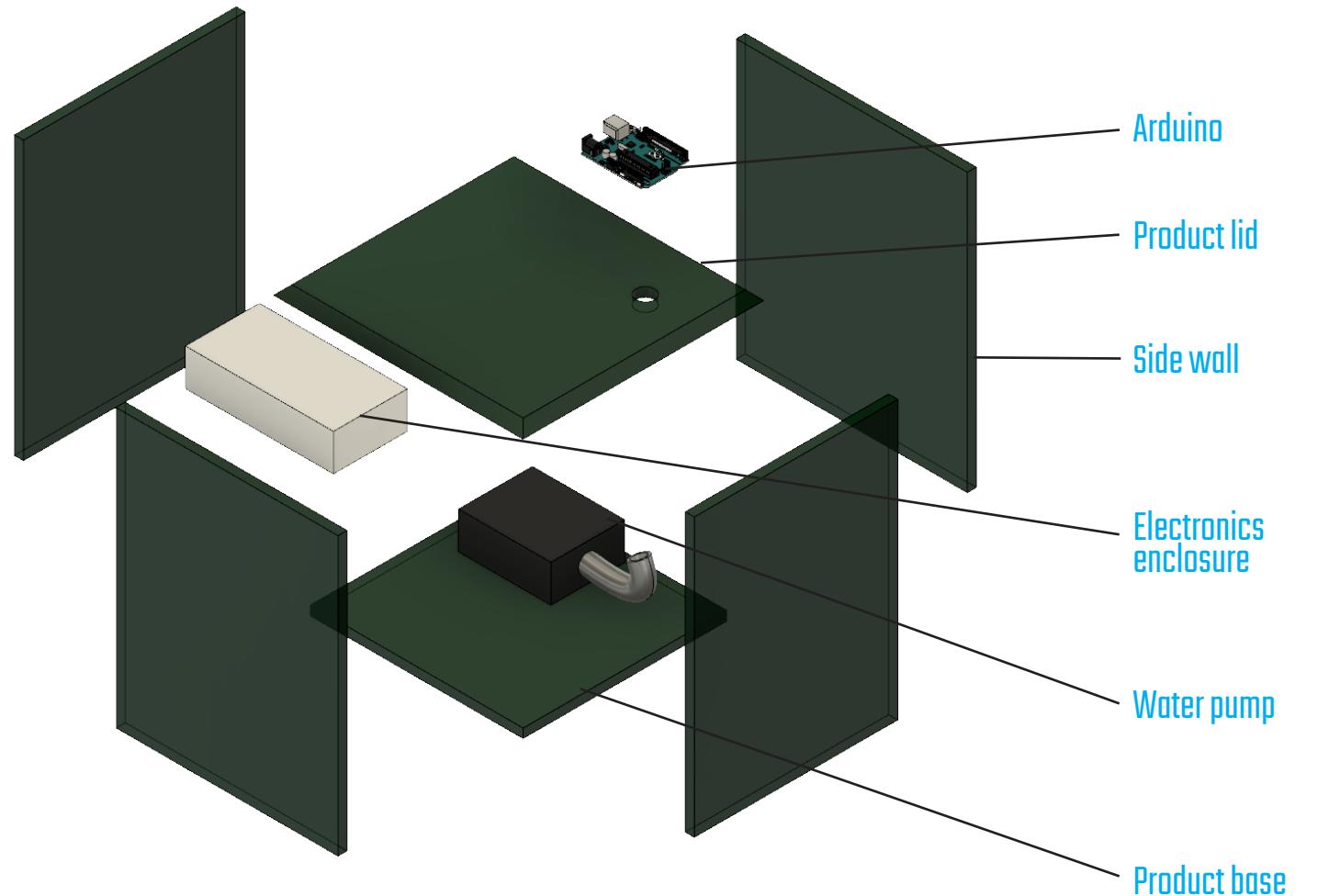
Expensive (\$130 for an area of up to 75 square feet)

User set watering frequency, not based on soil humidity

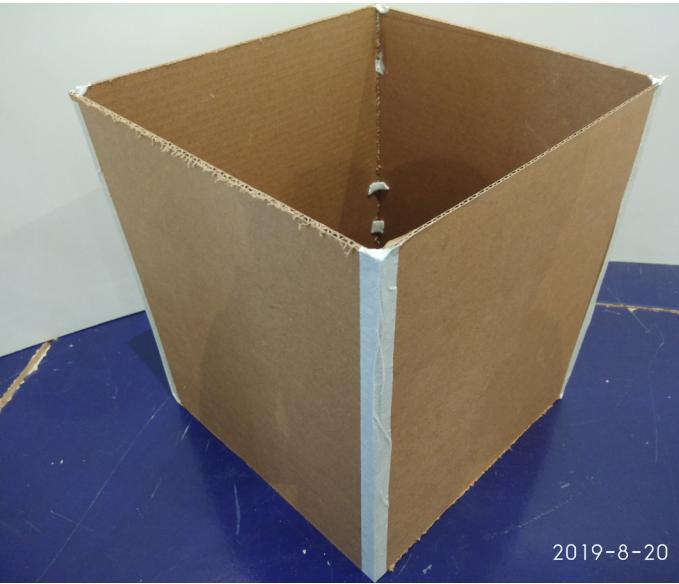
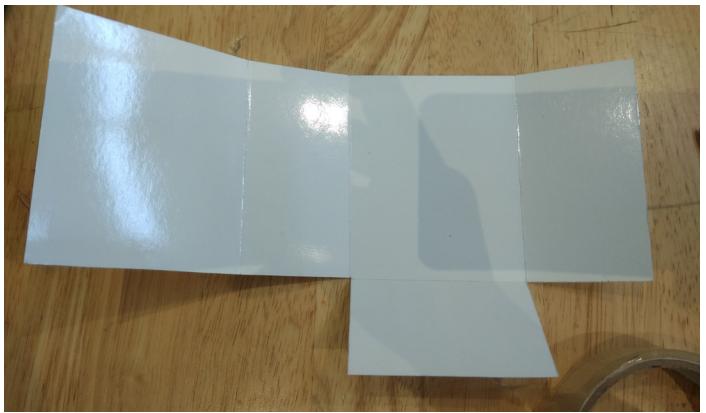
Sketch Ideation



Product Visualization



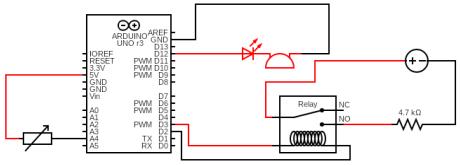
Prototyping



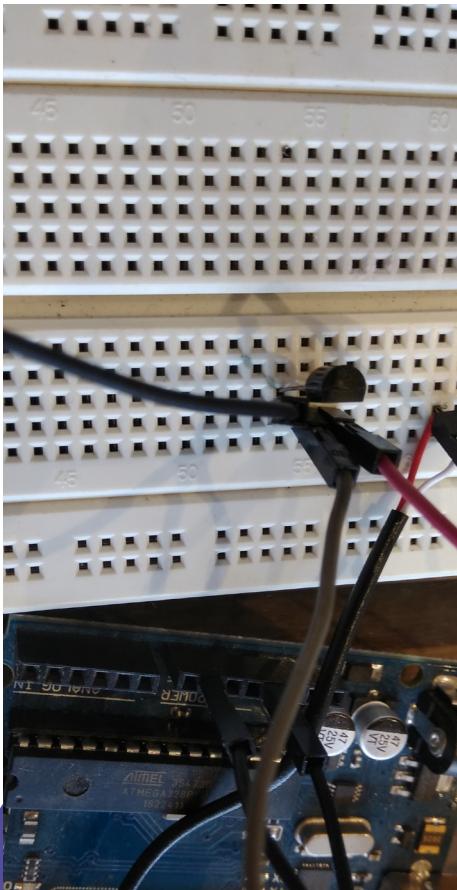
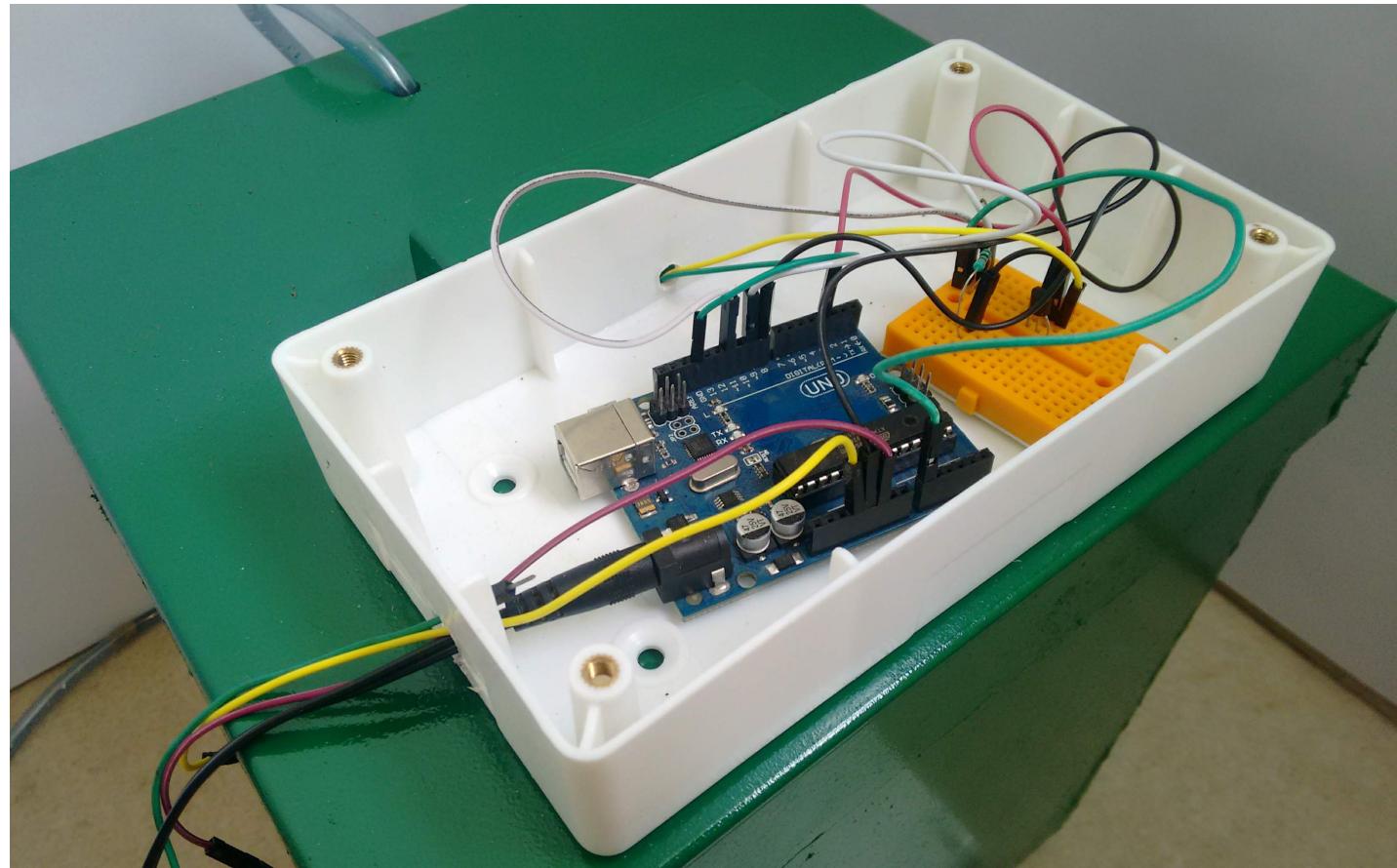
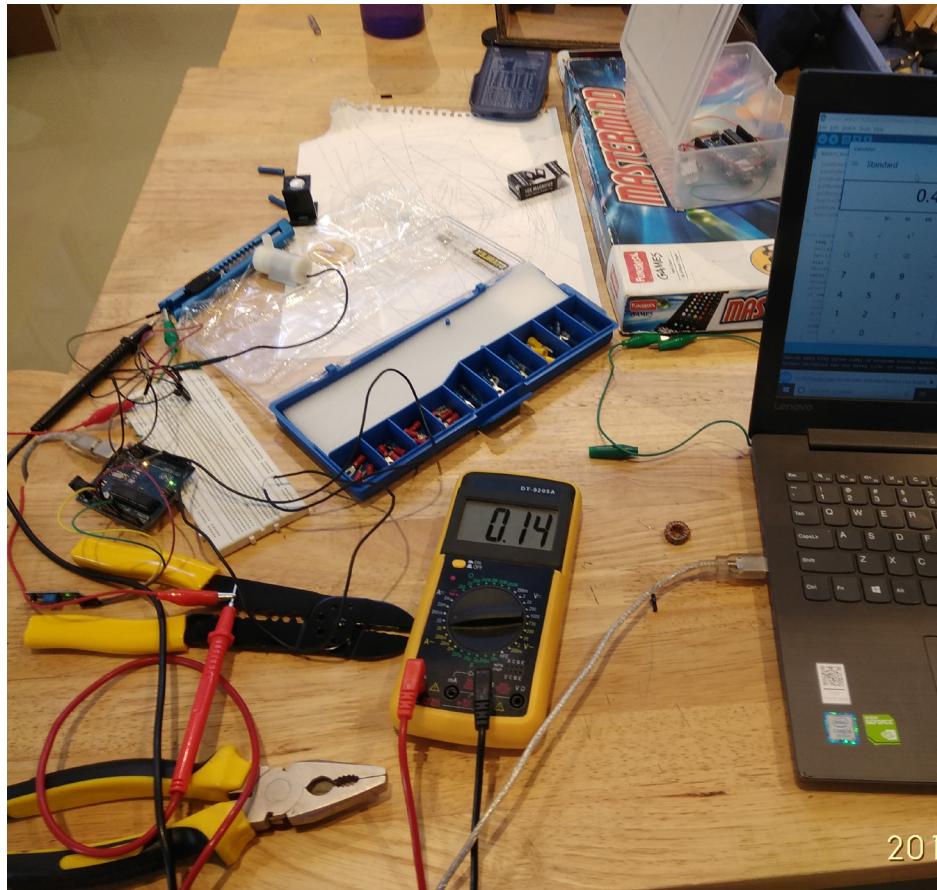
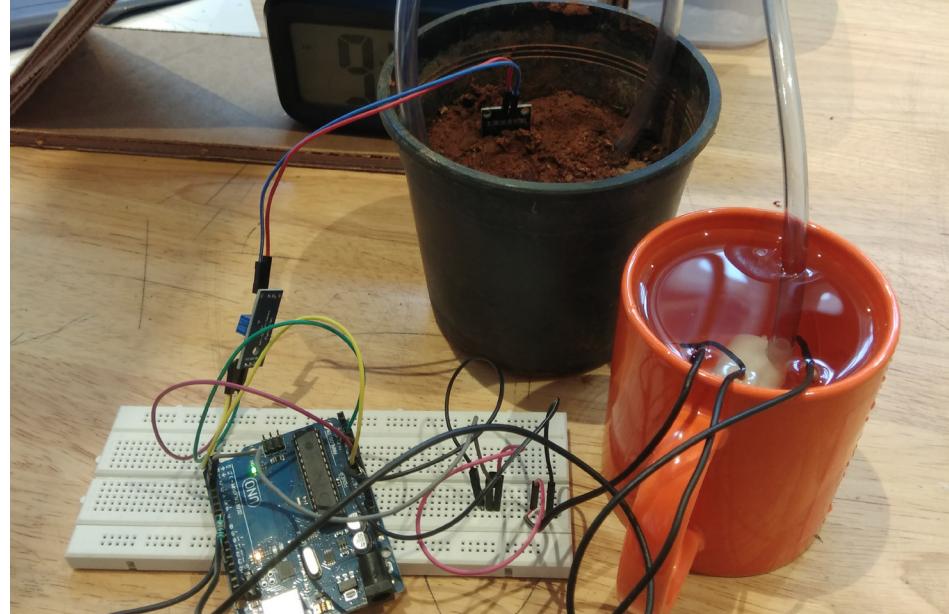
Material Exploration



Electronic Prototyping



sensor_sketch | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help
COM9
sensor_sketch
void loop() {
 temp = dht.readTemperature();
 Serial.print("temp: ");
 soil = analogRead(A0);
 Serial.println(soil);
 water = digitalRead(9);
 Serial.println(water);
 delay(1000);
 if (water == 0) { //Warn user if tank is empty
 digitalWrite(11,HIGH); //Switch on LED
 digitalWrite(12,HIGH); //Switch on buzzer
 delay(1000); //Buzz for 1 second
 digitalWrite(12,LOW); //Switch off buzzer
 enabled = 0; //Disable water pump
 }
 if (soil < 500) { //If soil humidity is low
 if (enabled == 1){ //If water is in the tank
 digitalWrite(3,HIGH); //Switch on water pump
 delay(2000); //Keep pump on for 2 seconds
 digitalWrite(3,LOW); //Switch off water pump
 }
 }
}
Done uploading.
Sketch uses 5130 bytes (15%) of program storage space. Maximum is 32256 bytes.
Global variables use 228 bytes (11%) of dynamic memory, leaving 18228 bytes free.
36



Finishing



VeBike

**Enabling enthusiasts and DIY builders to
make their own electric bike**



Who is it for?



Mark Martensen



New York, USA

Environmentalist



Energetic

World Traveller



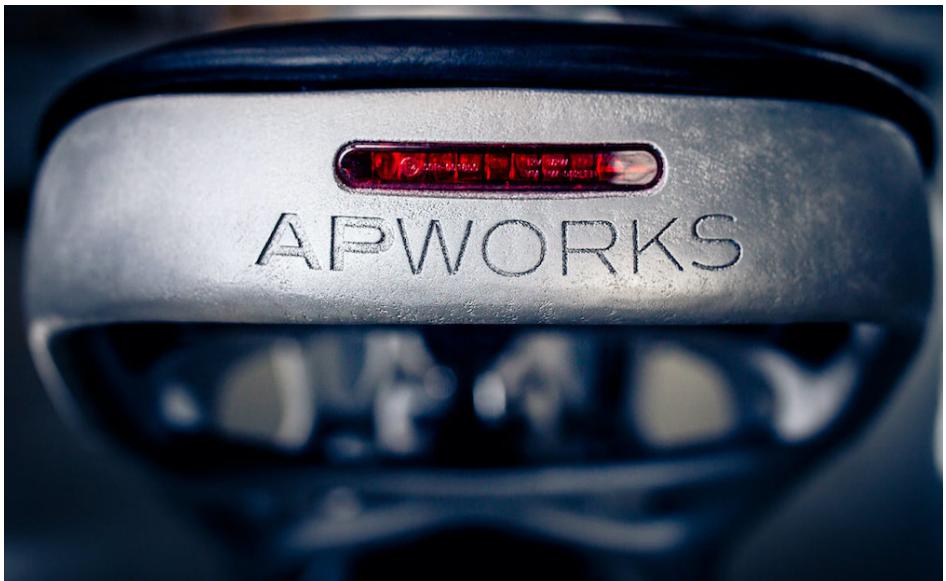
Entrepreneur

Video Blogger

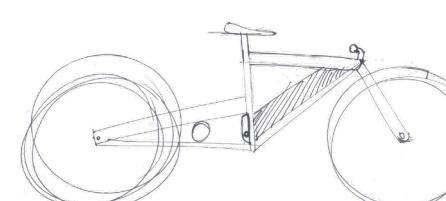
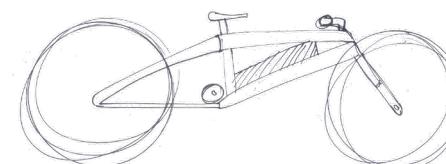
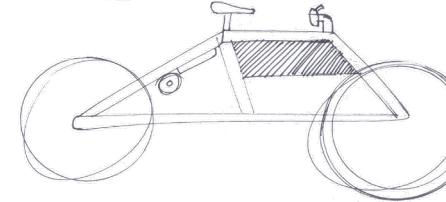
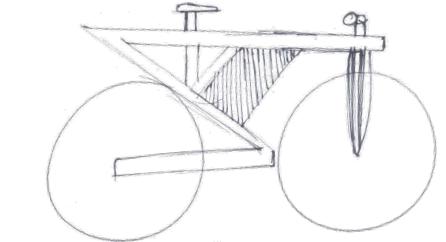
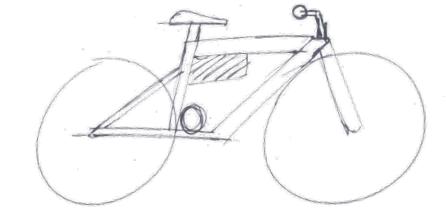
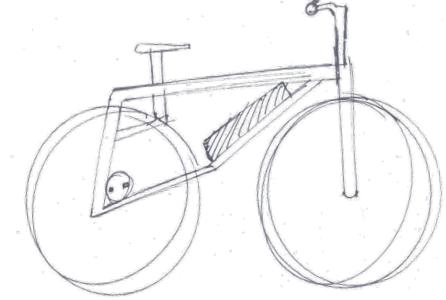
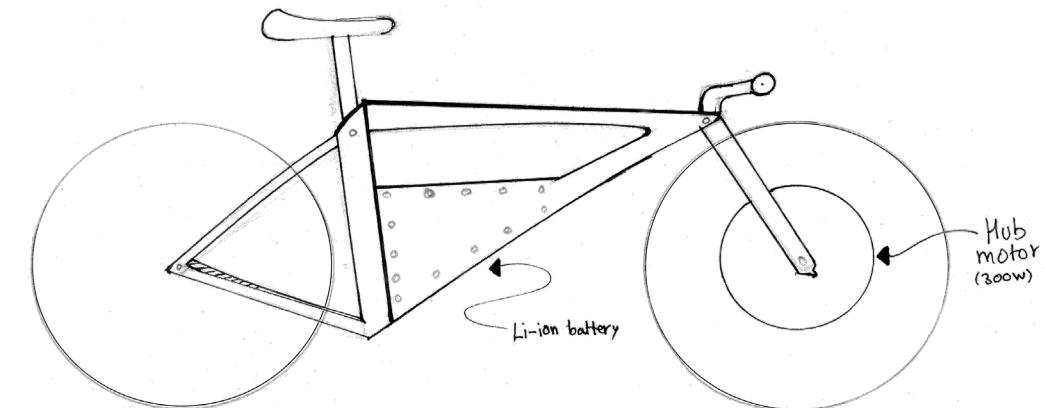
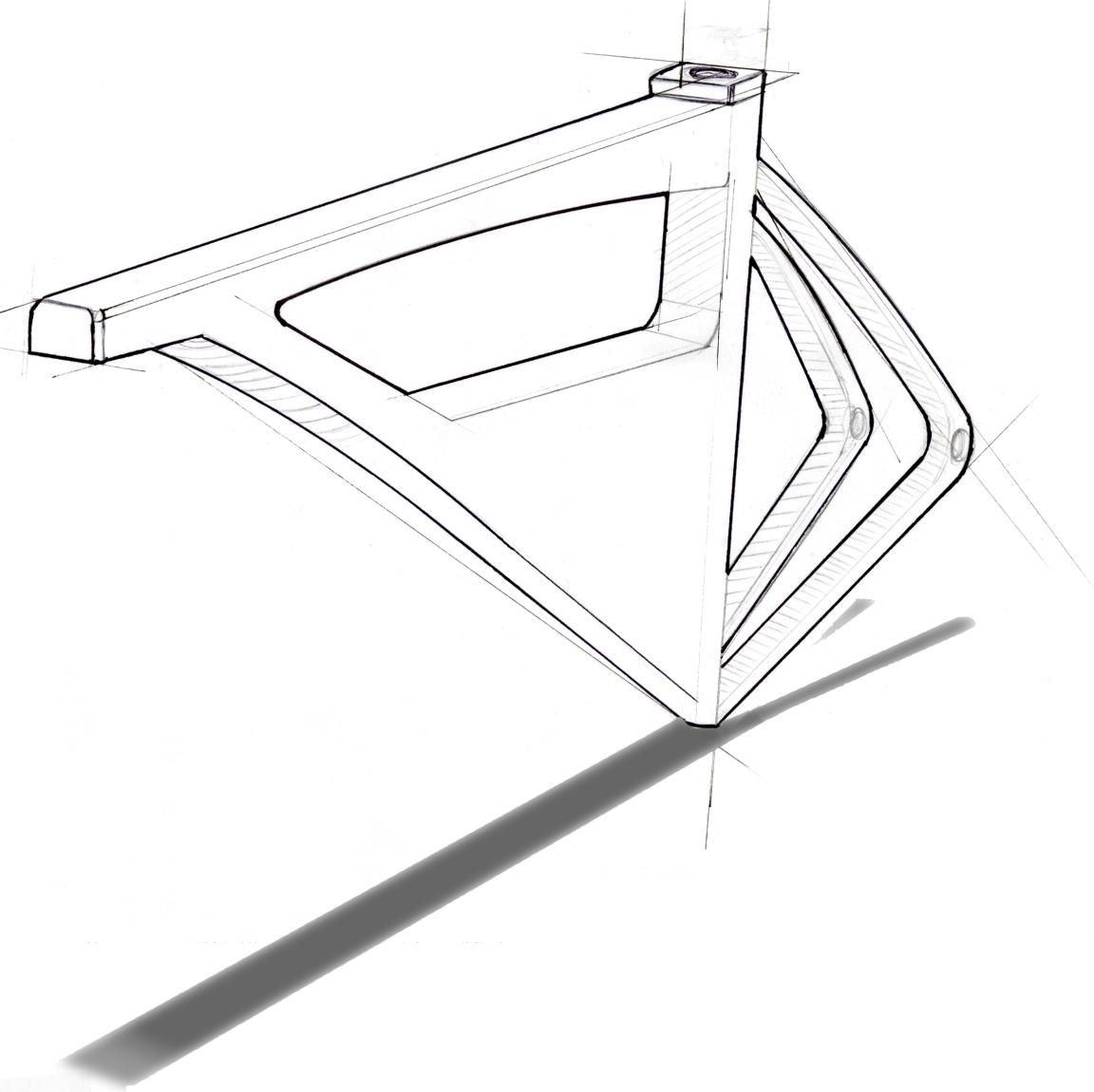
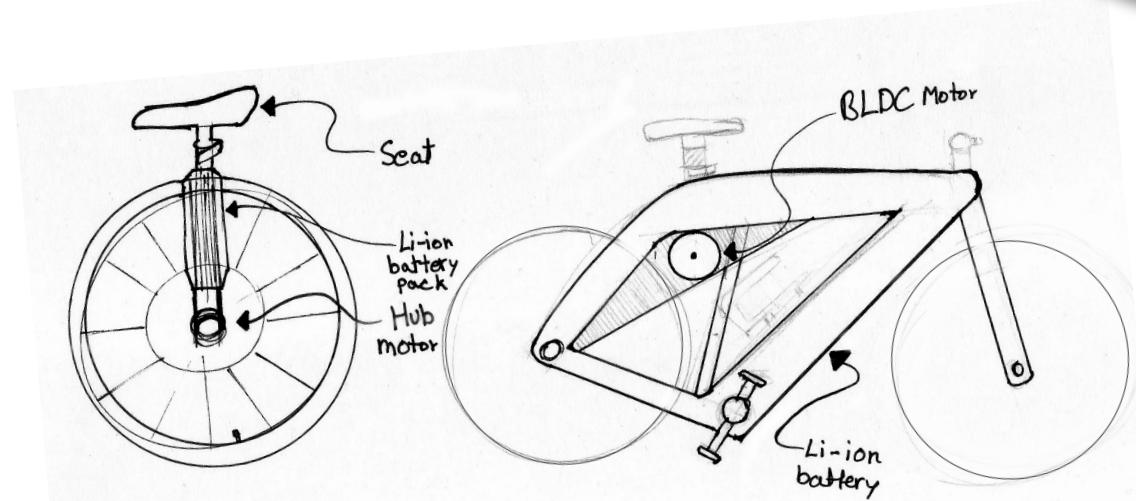
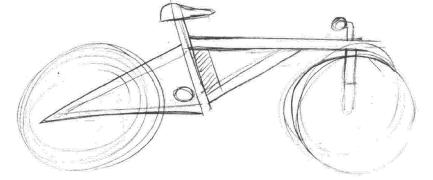
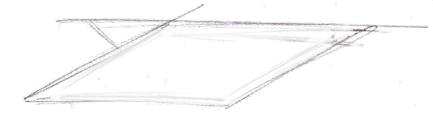
Mark wants to upgrade his bike by
making his own e-Bike



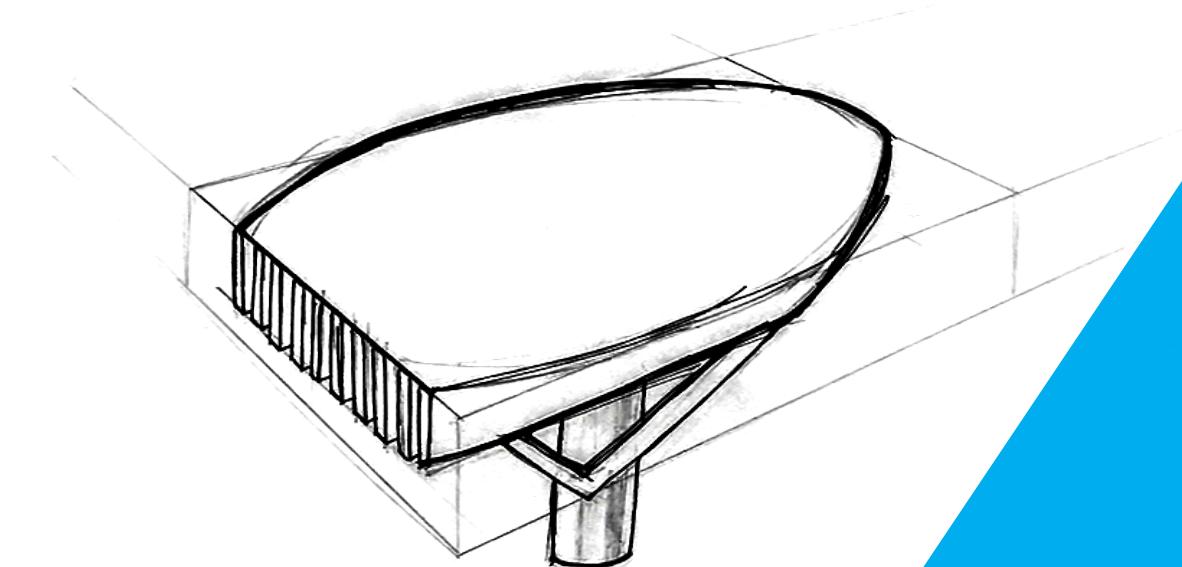
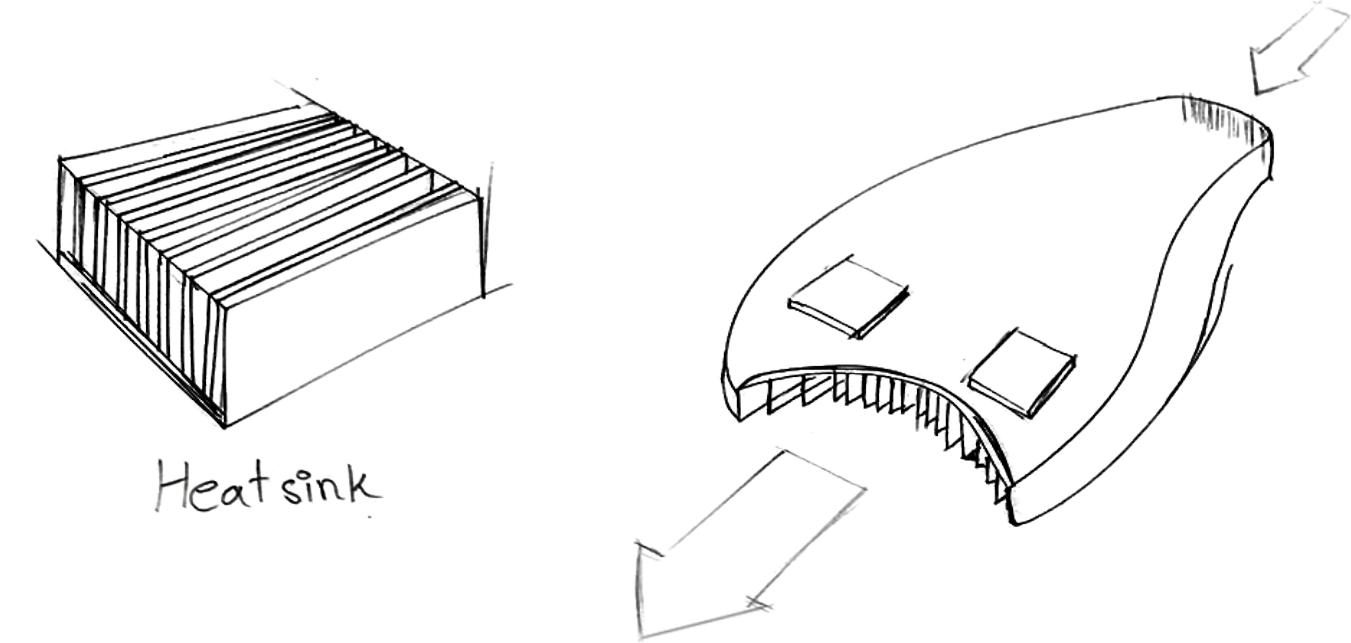
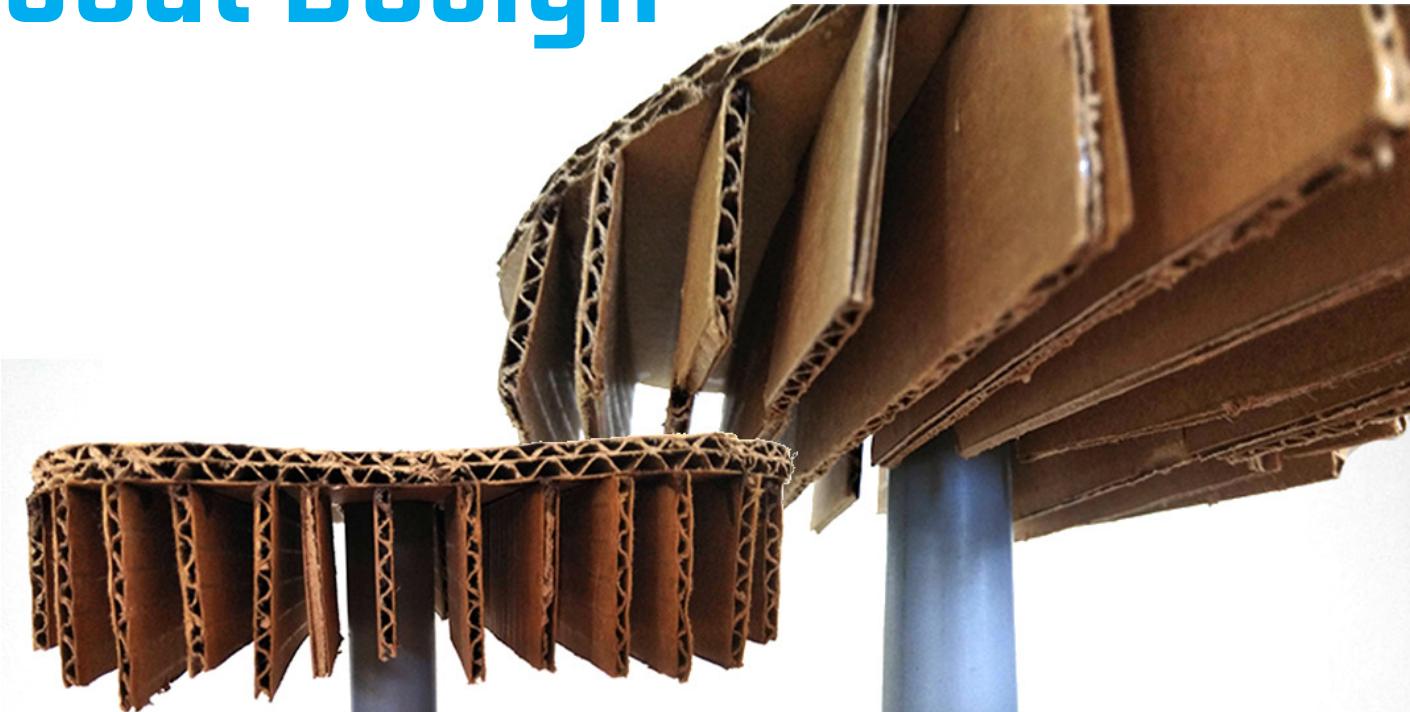
Inspiration



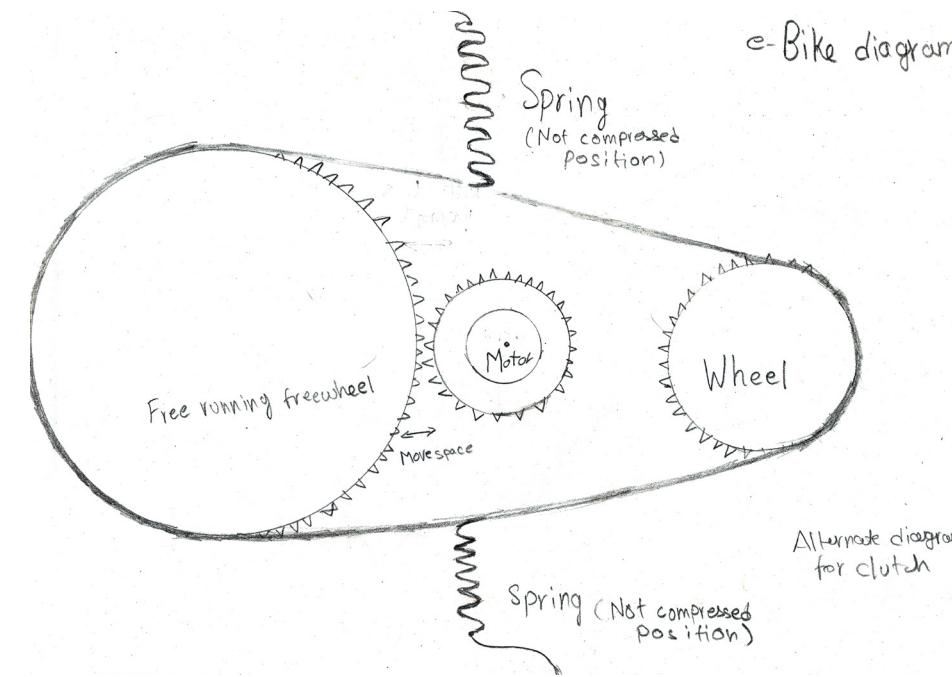
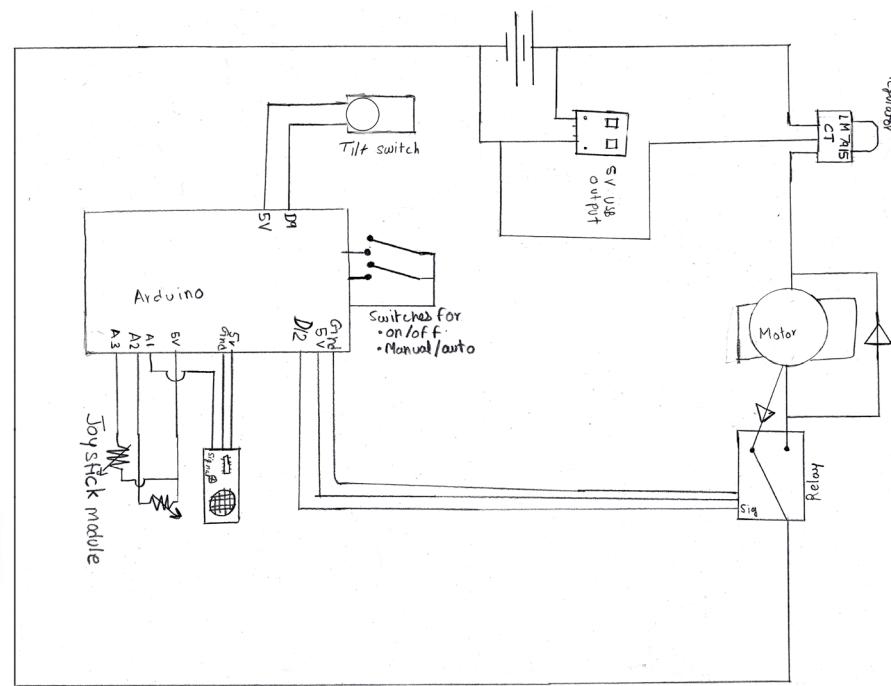
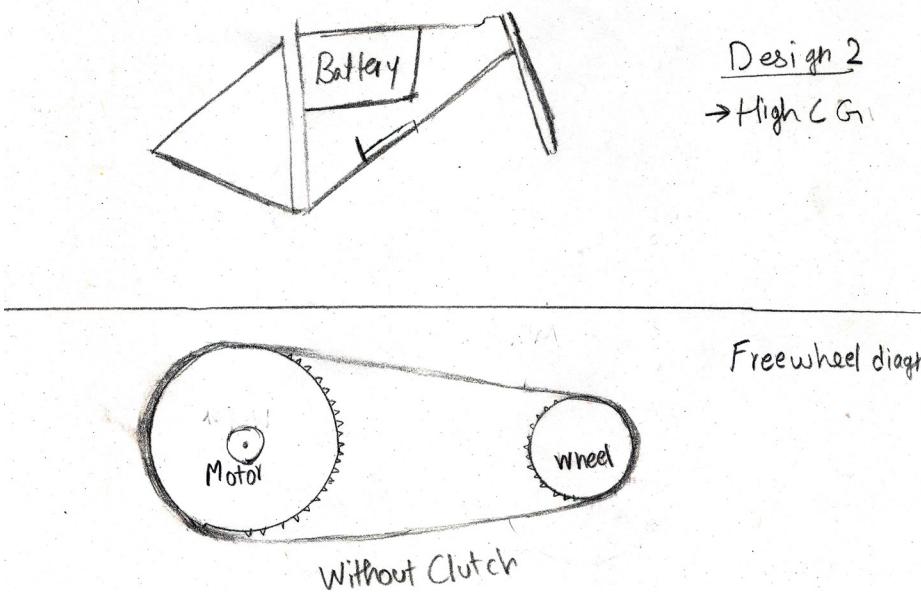
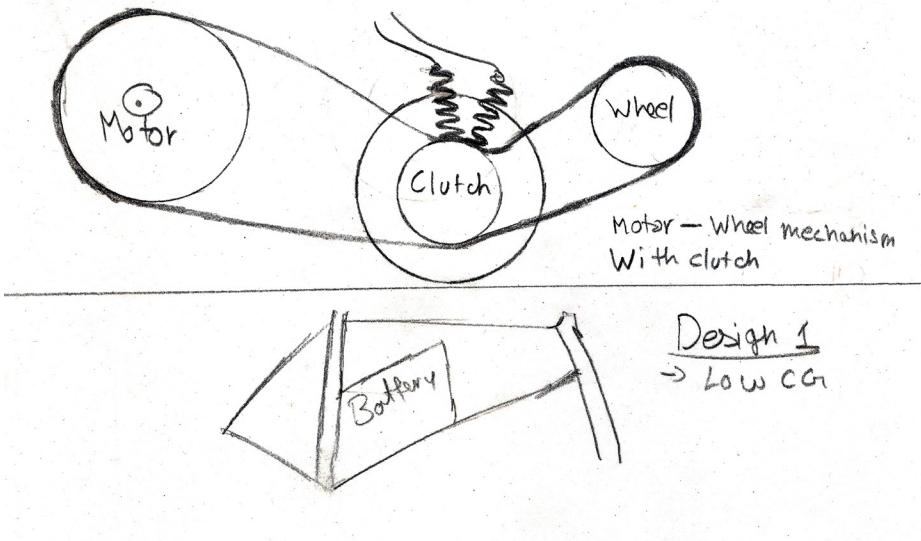
Sketch Ideation



Seat Design

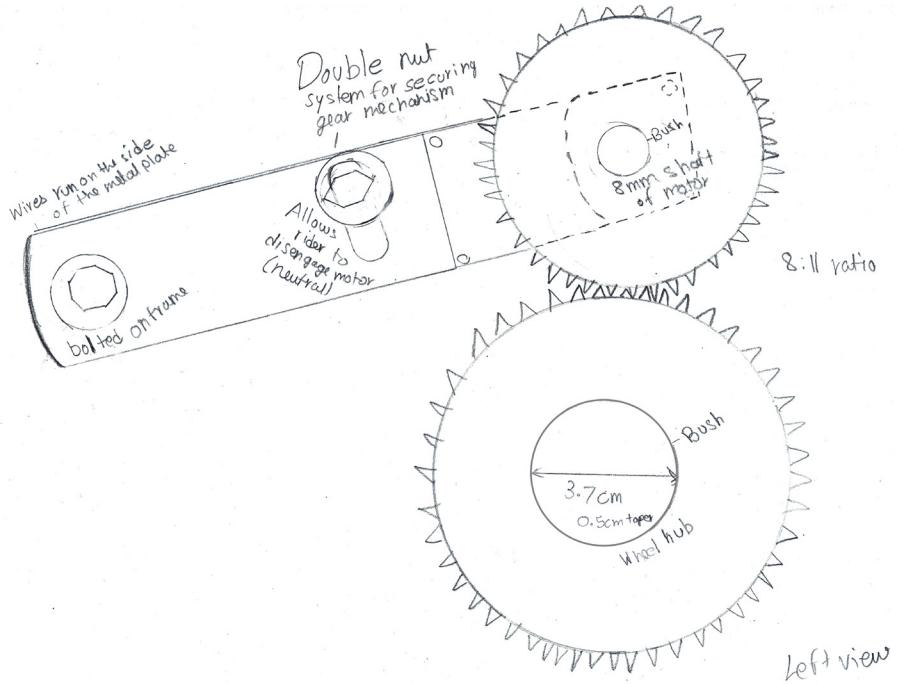


Engineering the Bike

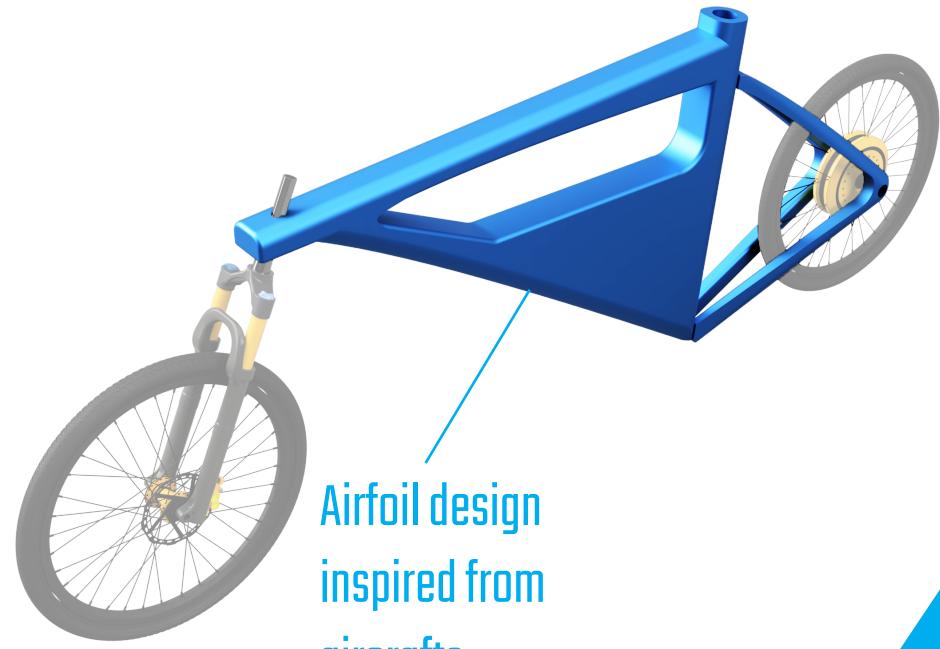
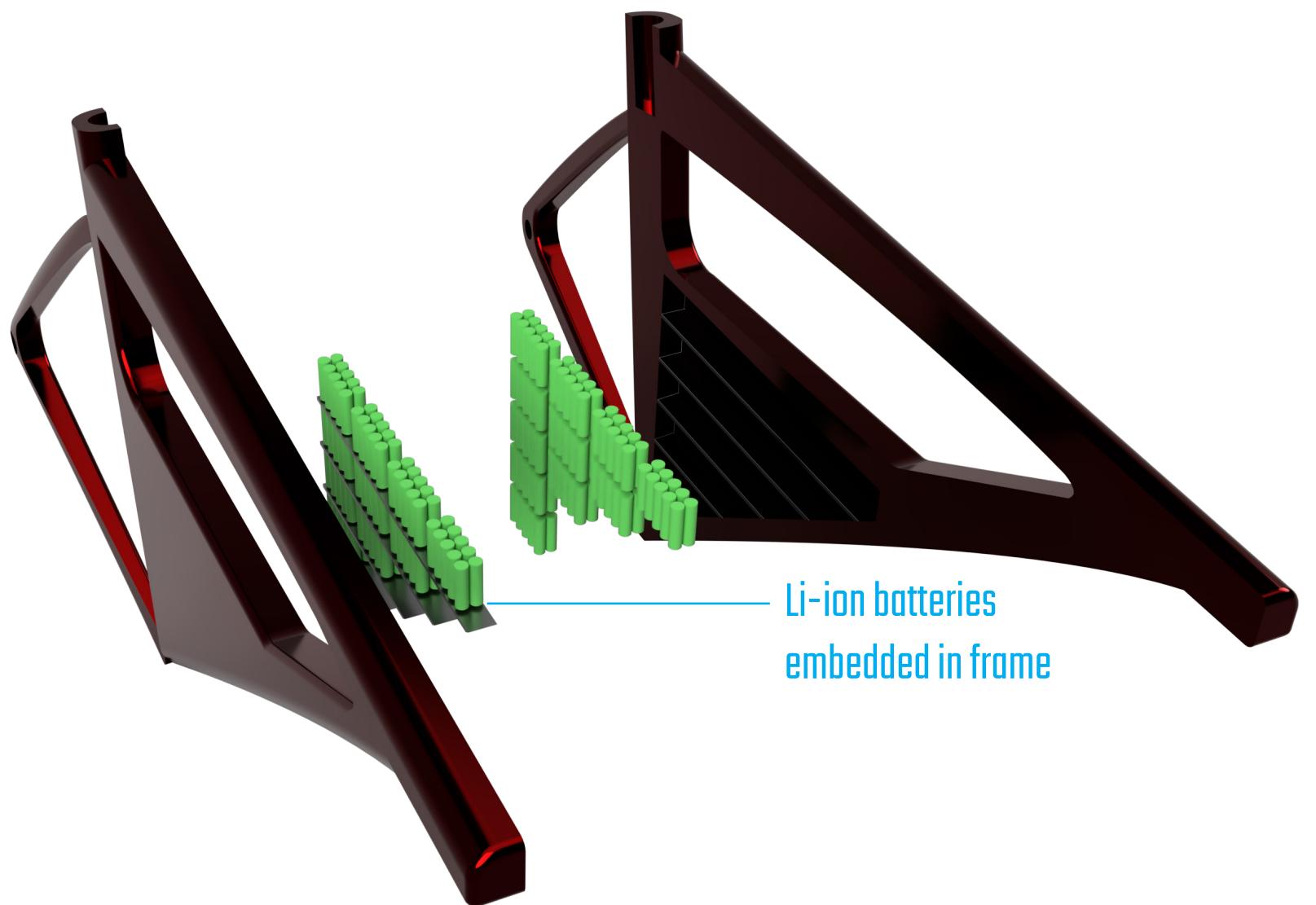


How it Works

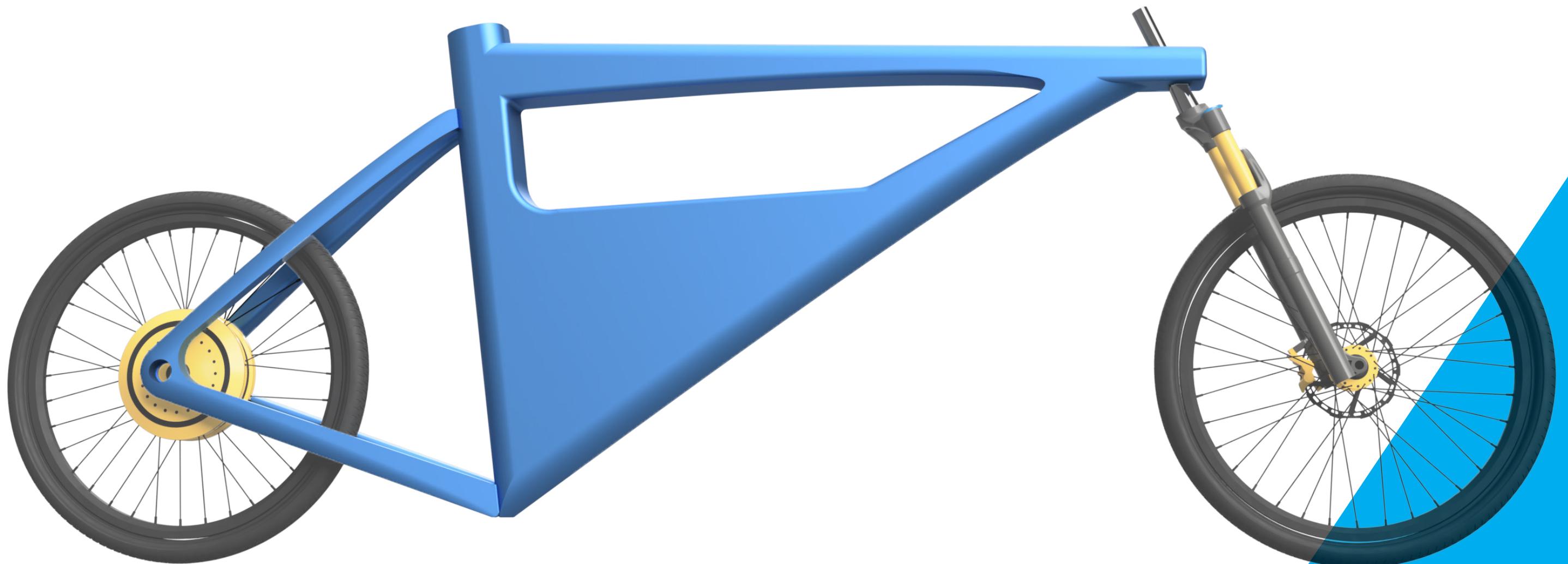
- A 200W DC motor powers the rear wheel, connected through gears with a 8:11 gear ratio
- Two 7Ah 12 Volt Batteries power the bike
- An Arduino is used to take sensor input, and joystick input to control the motor through a motor driver



Design Features

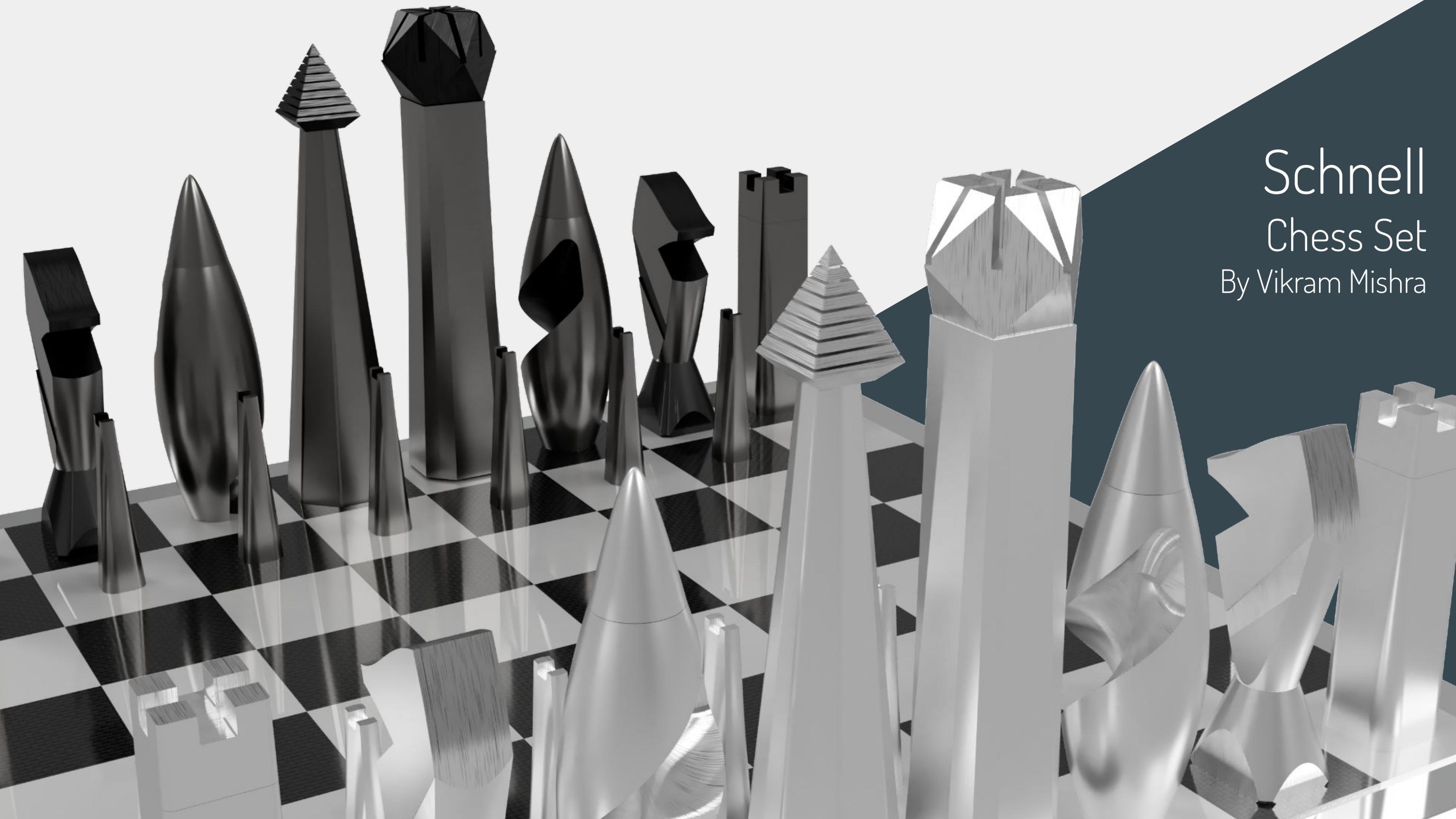


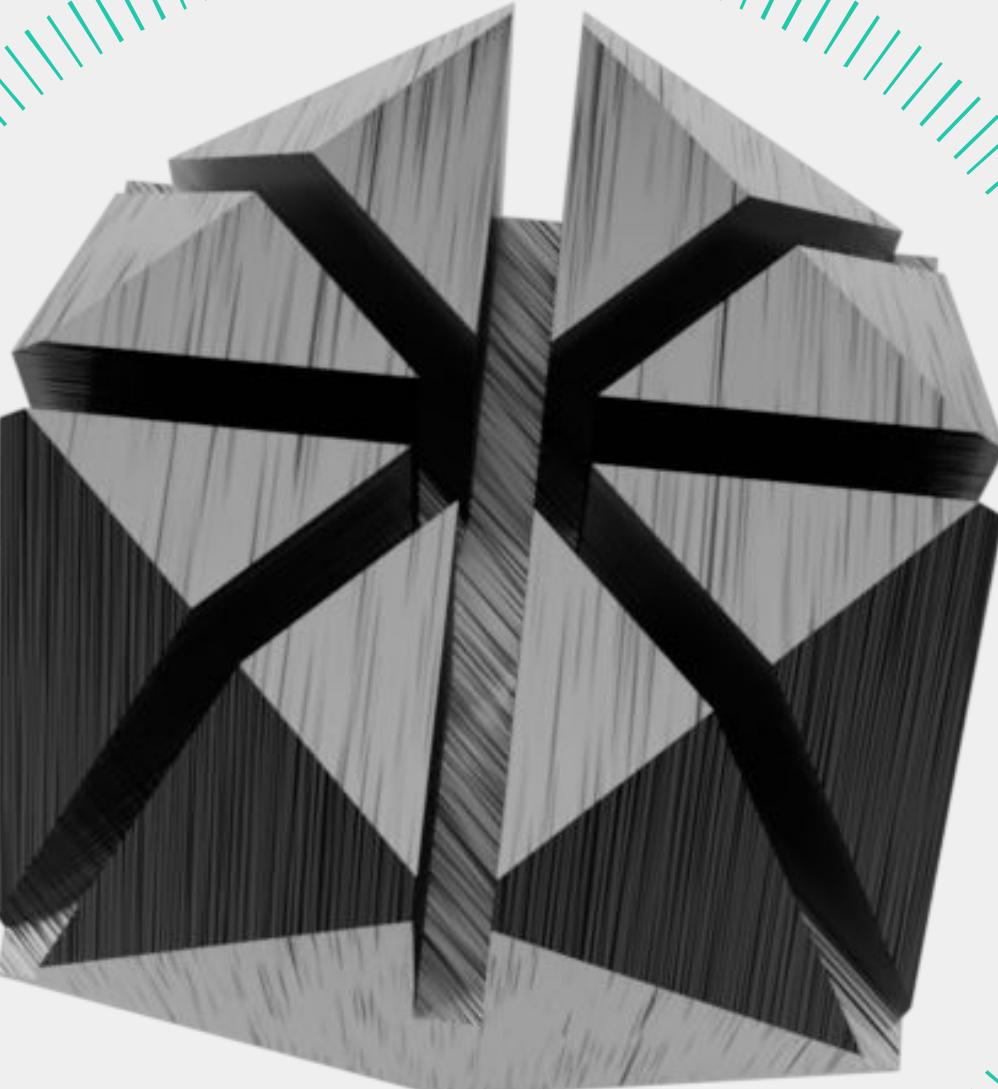
VeBike



Schnell Chess Set

By Vikram Mishra

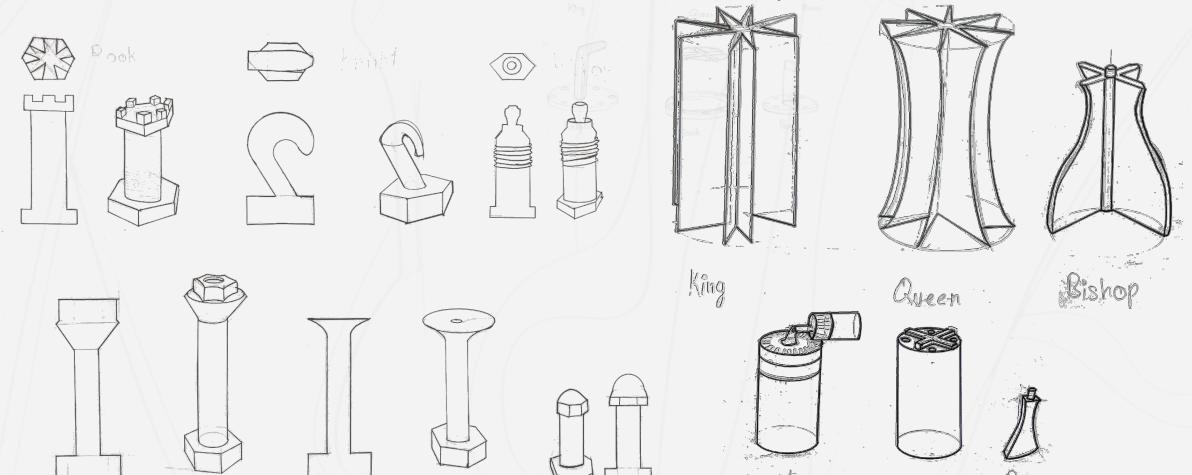
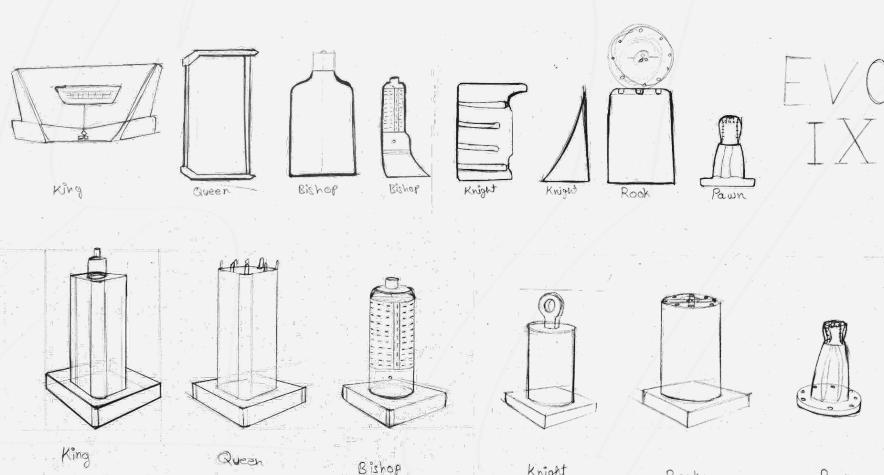
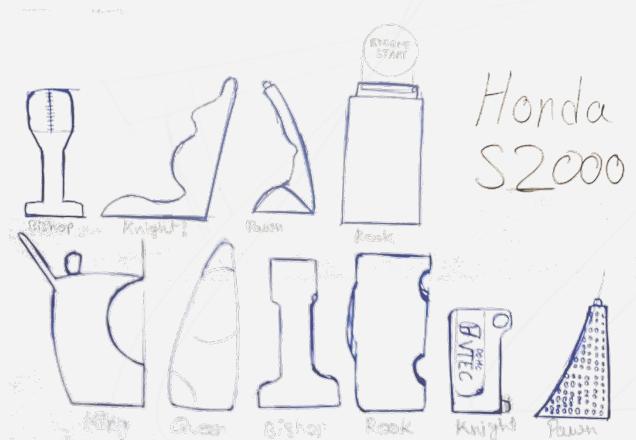
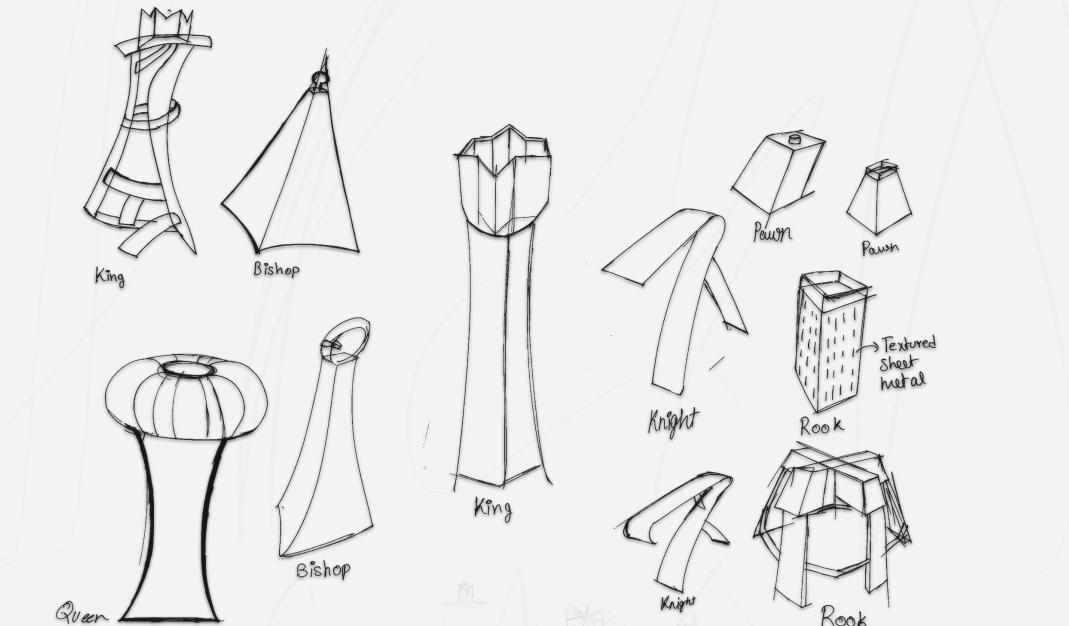
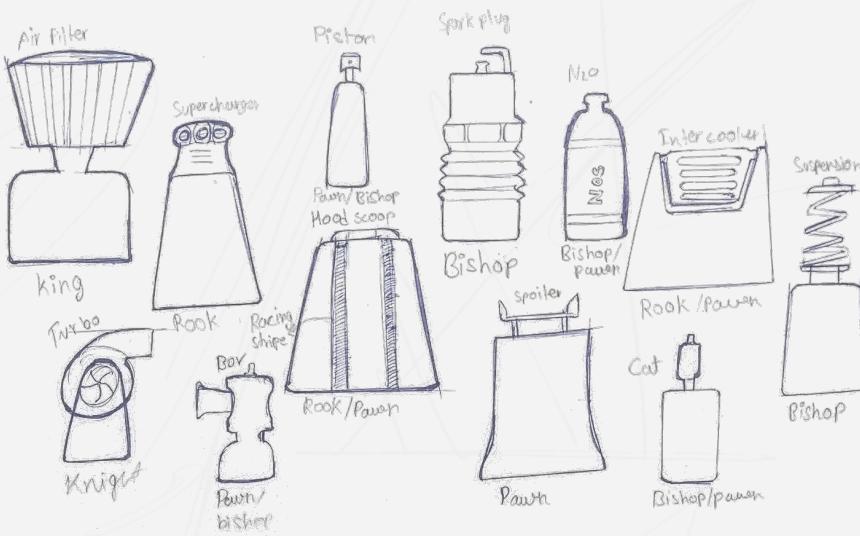
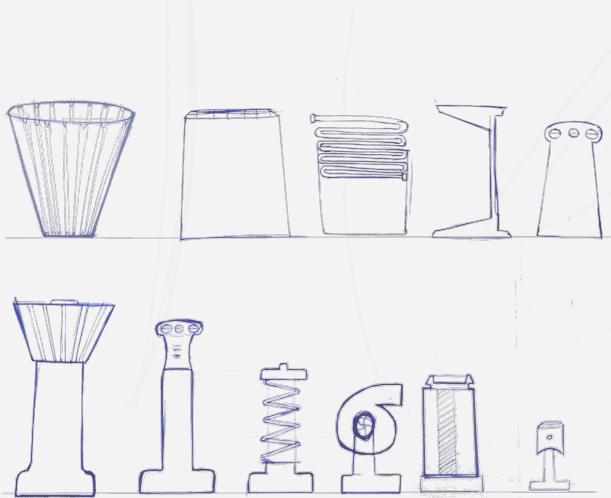




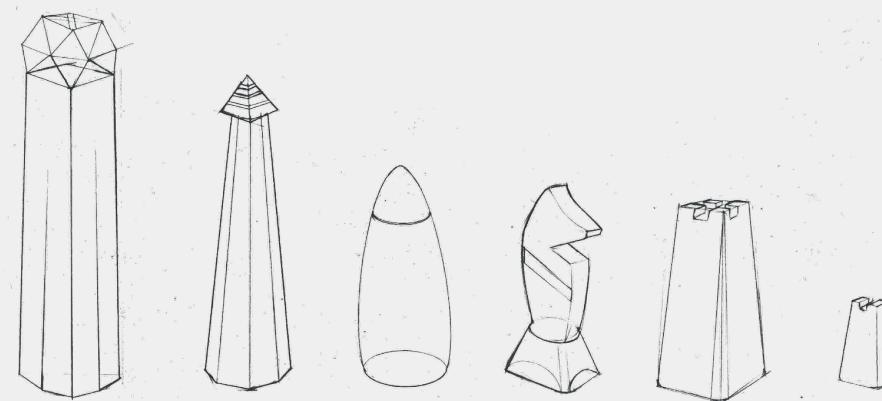
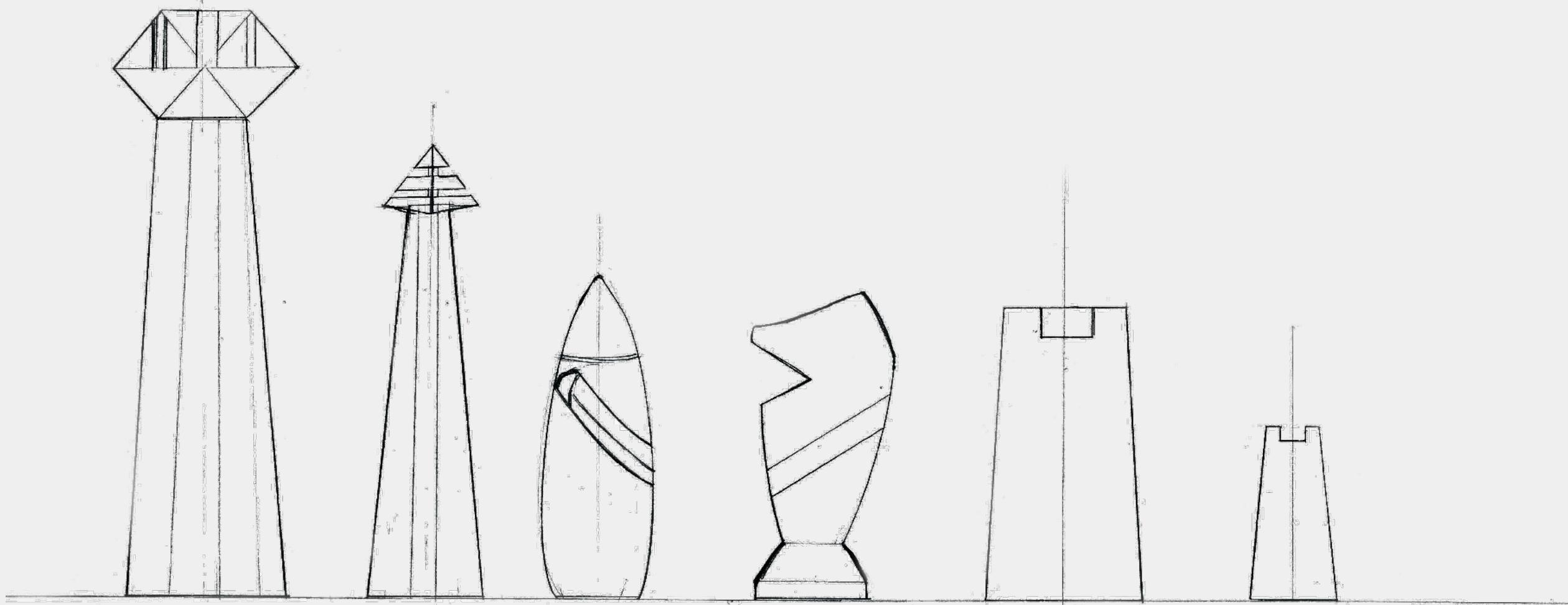
AESTHETIC

Made from finely machined metal pieces, this chess set will fit in corporate offices of automotive companies and in car showrooms and dealerships, as well as in garages with collectable cars and as a showpiece in cabinets in houses of automobile enthusiasts who enjoy customizing vehicles, especially with custom made parts

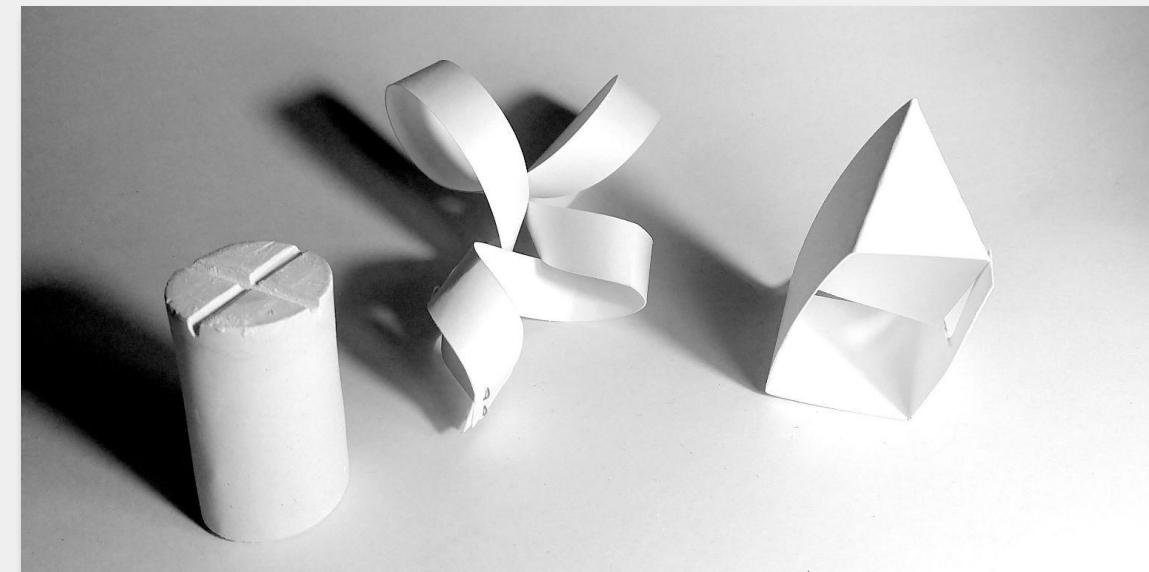
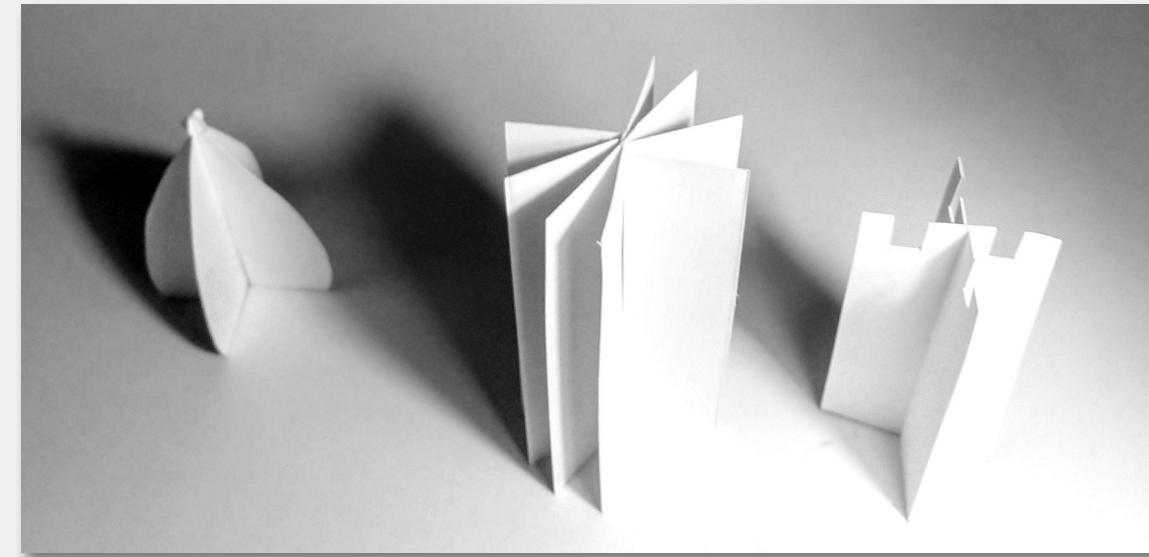
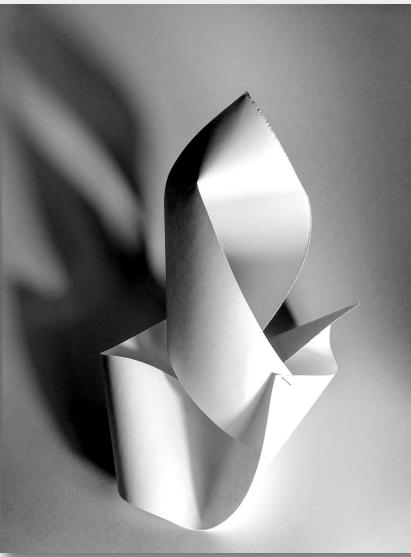
SKETCH EVOLUTION



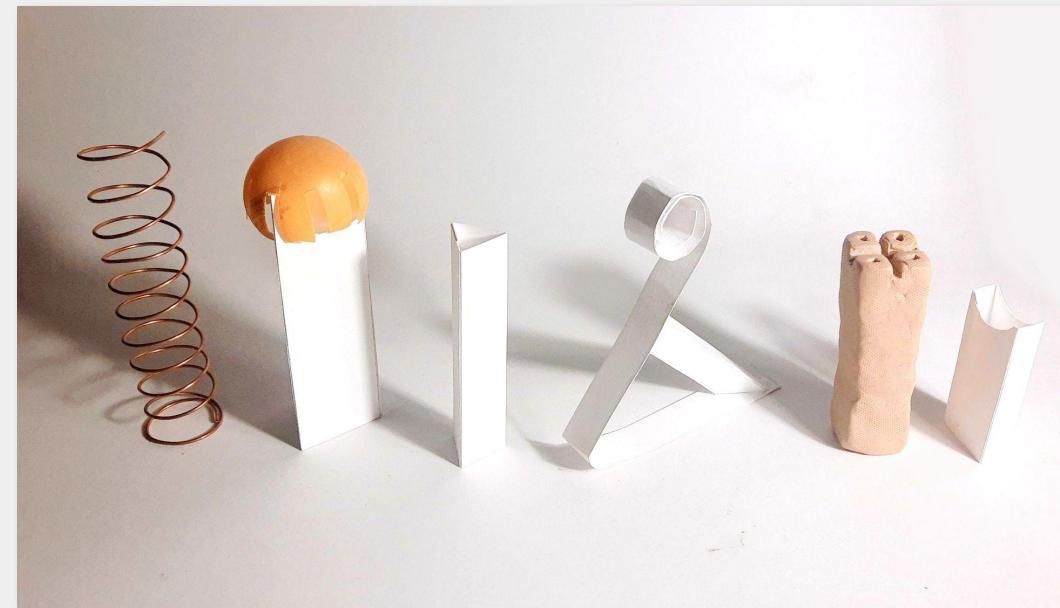
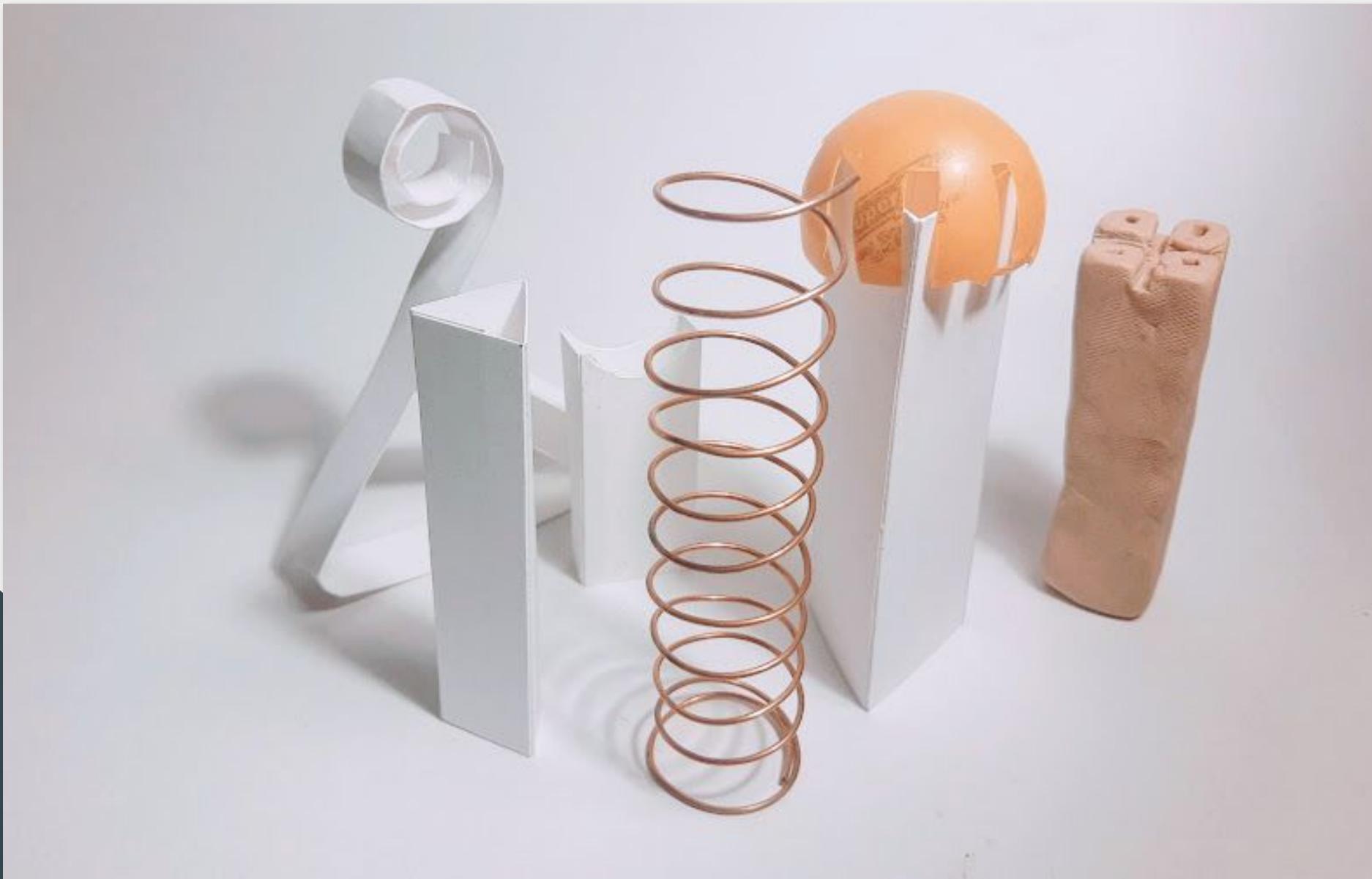
CULMINATION SKETCHES



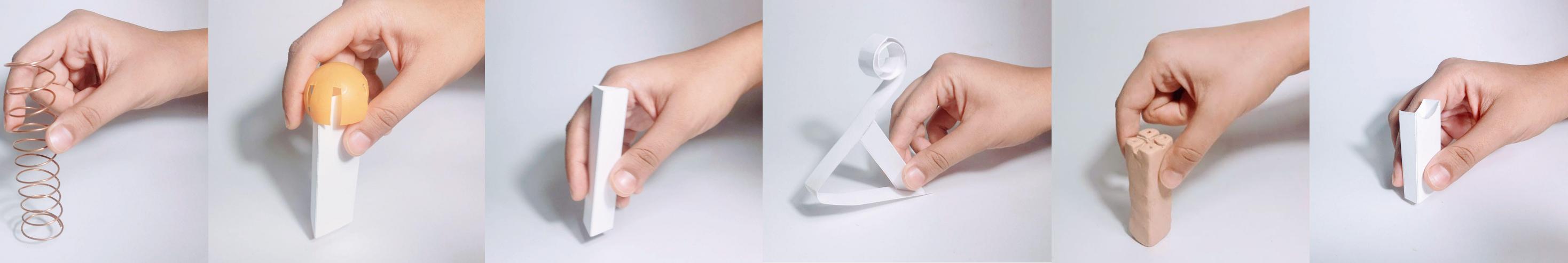
3D SKETCHES



RESOURCEFUL PROTOTYPES



HUMAN FACTORS EVALUATION



IDENTIFICATION

- The pieces were identifiable primarily through the hierarchy
- The bishop doesn't have any features of the conventional bishop, it is difficult to identify

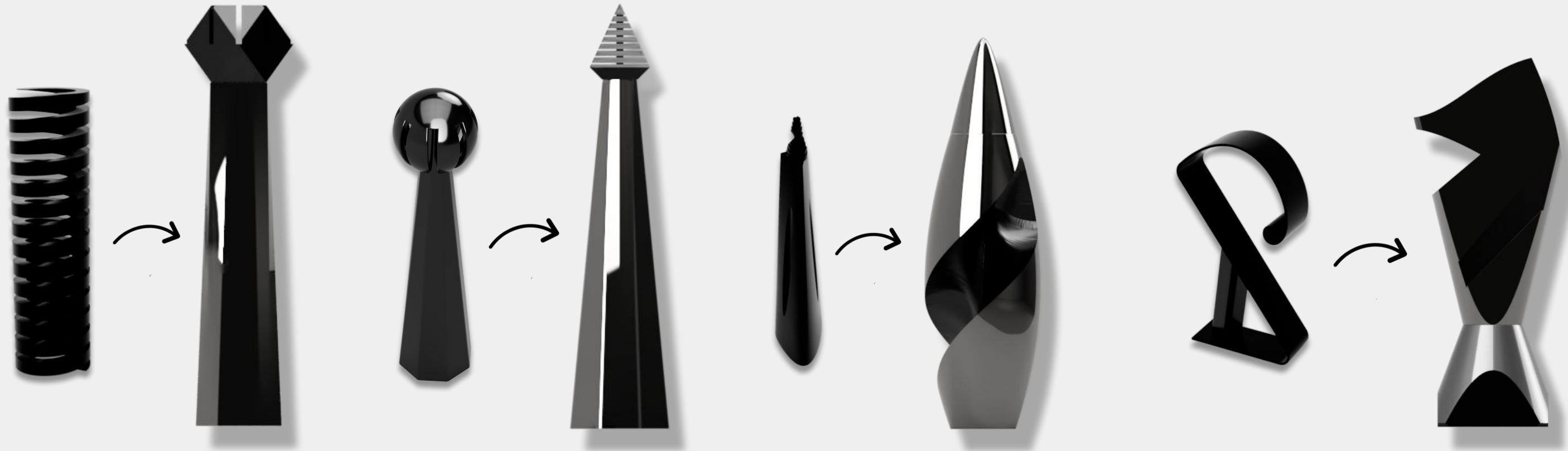
GRASPING

- The pieces were grasped without any hesitation and without much thought
- The rook and Queen were grasped from the top while the rest were grasped from the middle or the bottom

CONCLUSIONS

- The pieces could be more successful at being identifiable using features other than the hierarchy of size
- The design of the pieces does not interfere with grasping and picking them up

DESIGN CHANGES



King incorporates idea of a finely machined custom top attached to a casted base
The form becomes more aesthetic

Top of the queen becomes easier to manufacture in a CNC machine

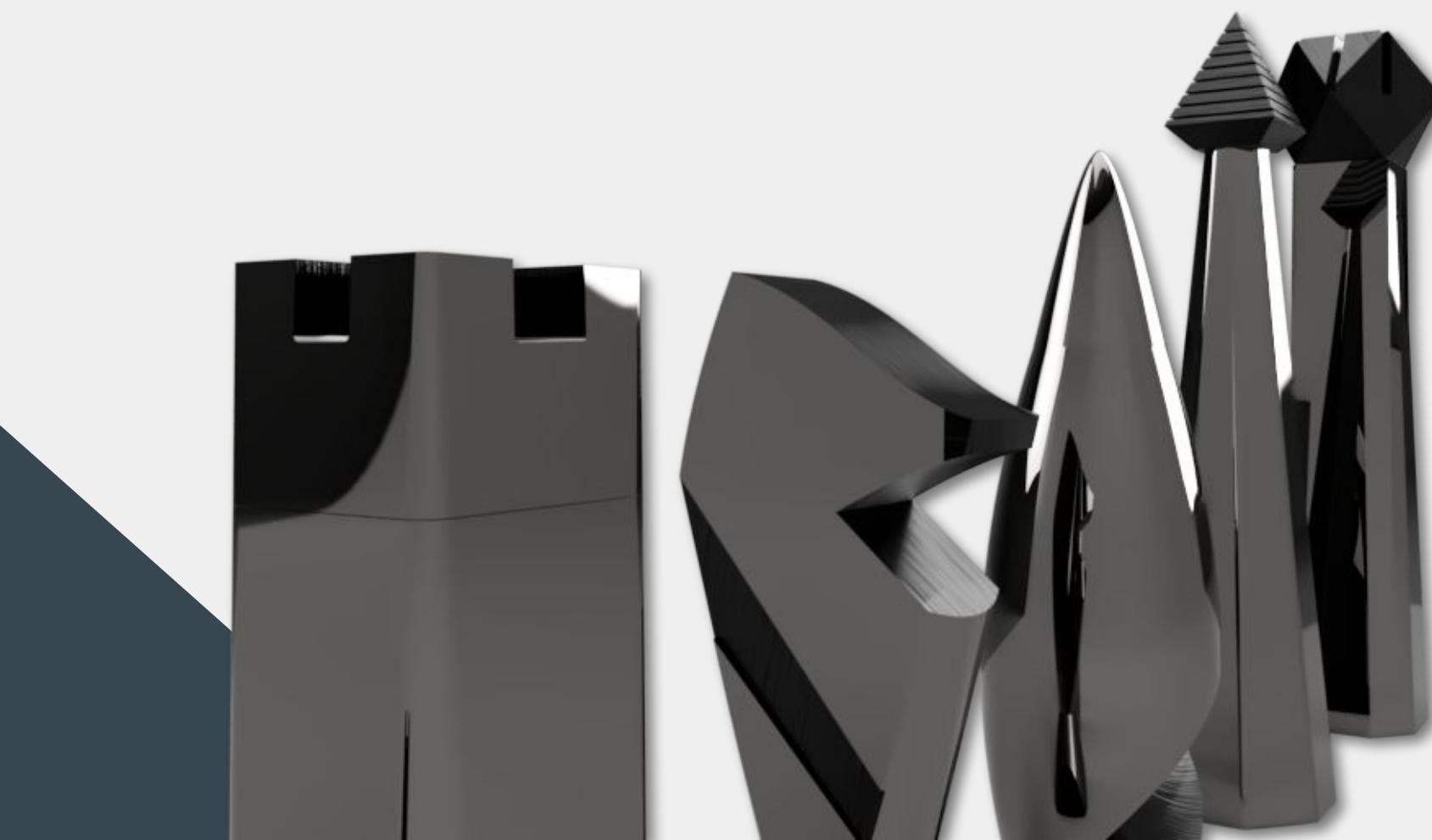
Bishop becomes more aesthetic and uniquely identifiable

Knight design changes from functional to aesthetic
Manufacturing process changes from bending sheet metal in a metal shop to a CNC machine

THE FINAL FORM



TEXTURE CONSIDERATION



CNC Brushed
Stainless Steel

Smooth Casted
Stainless Steel

