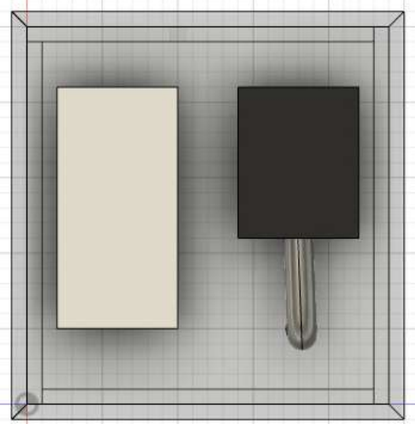
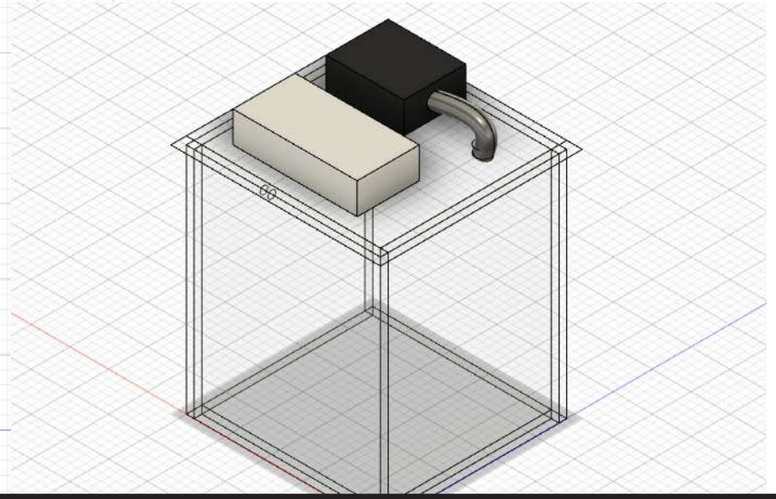
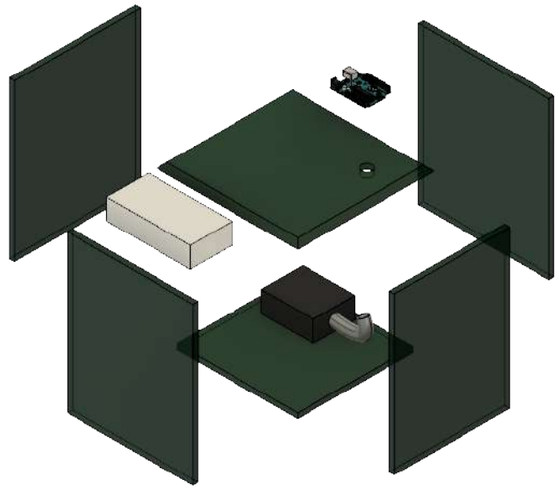
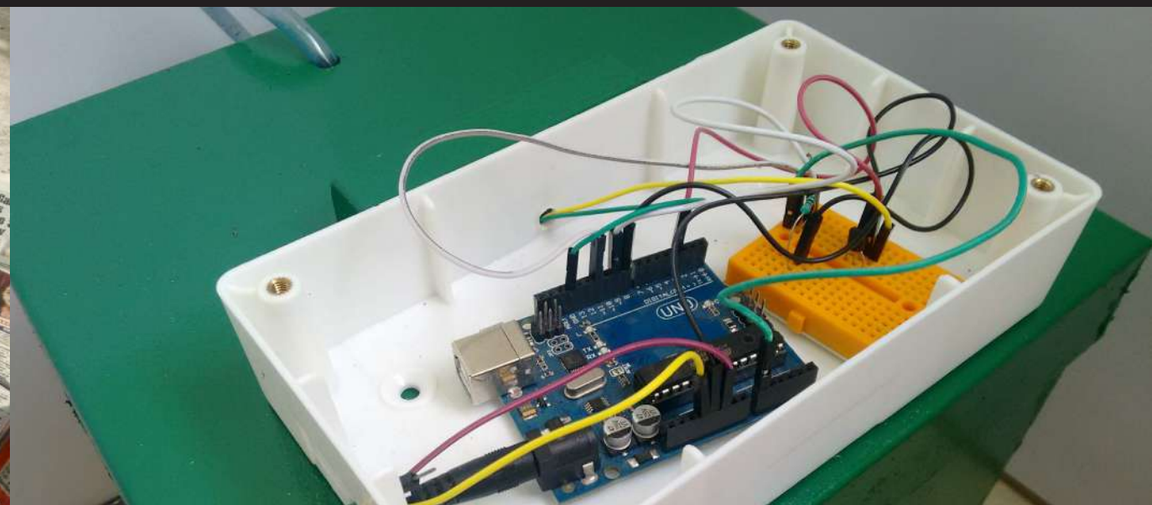






Eureka

Automated Watering Assistant



Why Automate Watering?

Conserves 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 seap into the soil, providing sub-surface watering.

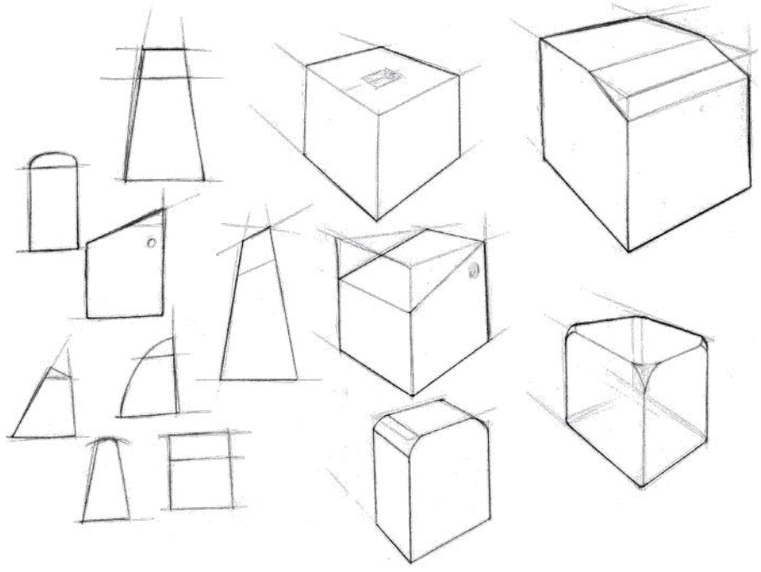
Advantages:

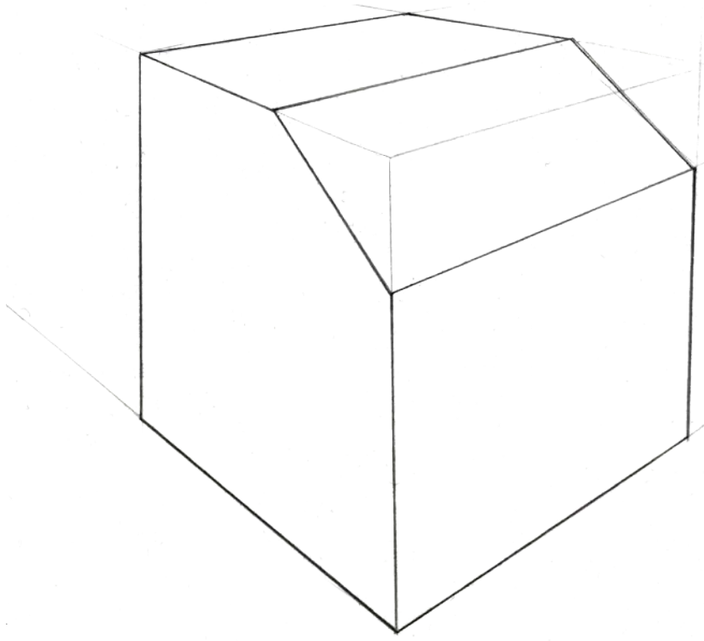
Saves water compared to usual watering
Better growth of plants
Does not require digging
One time set-up

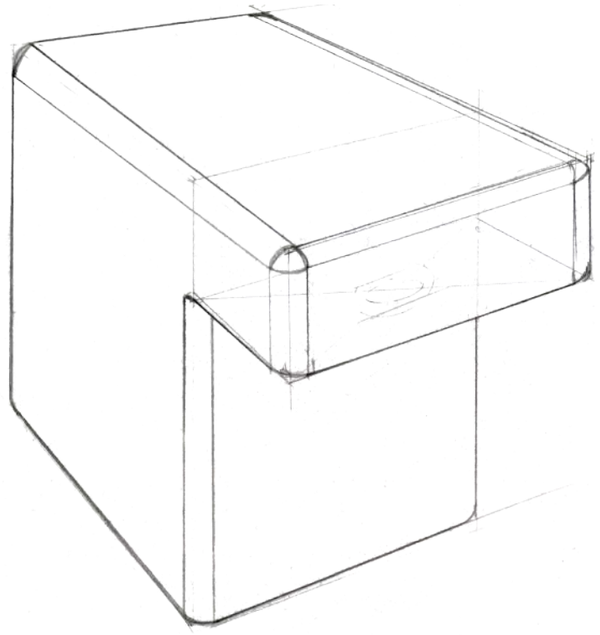
Disadvantages:

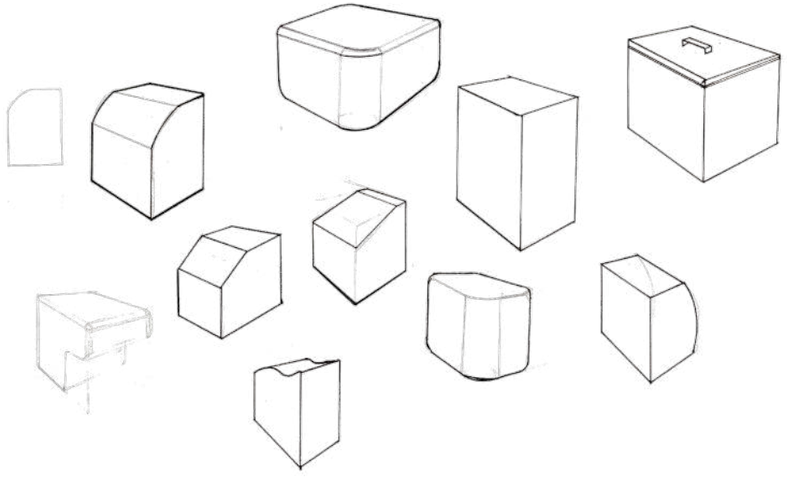
Requires a constant pressurized water supply
Expensive($130 for an area of up to 75 square feet)
User set watering frequency, not based on soil humidity

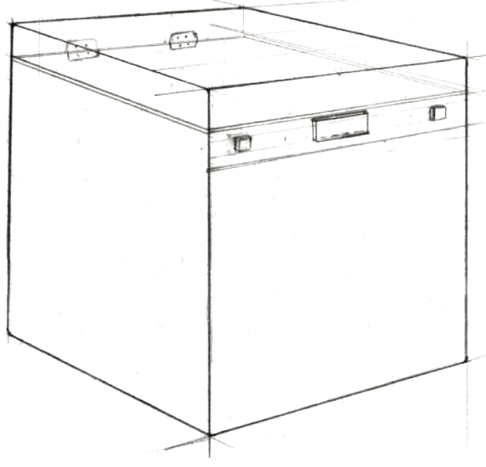
Sketch Ideation

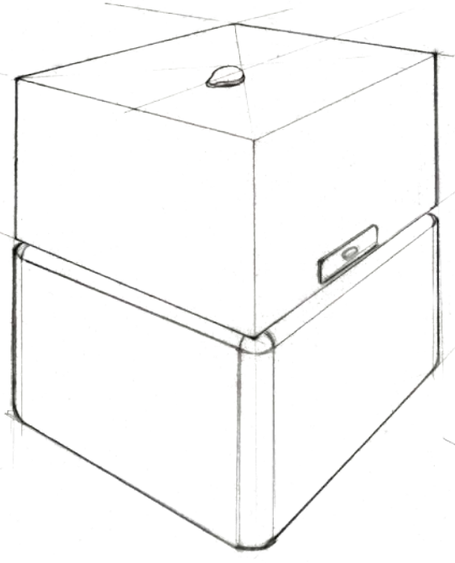


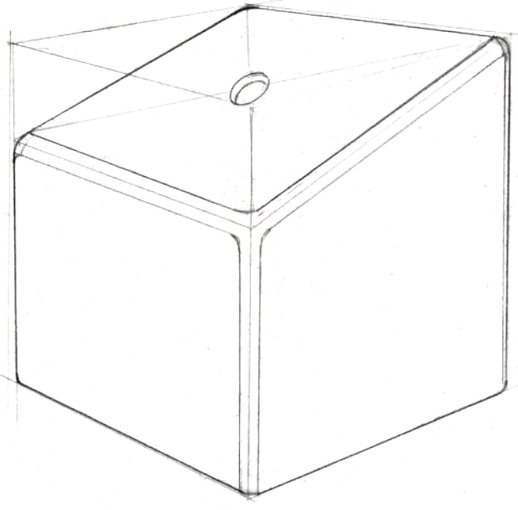




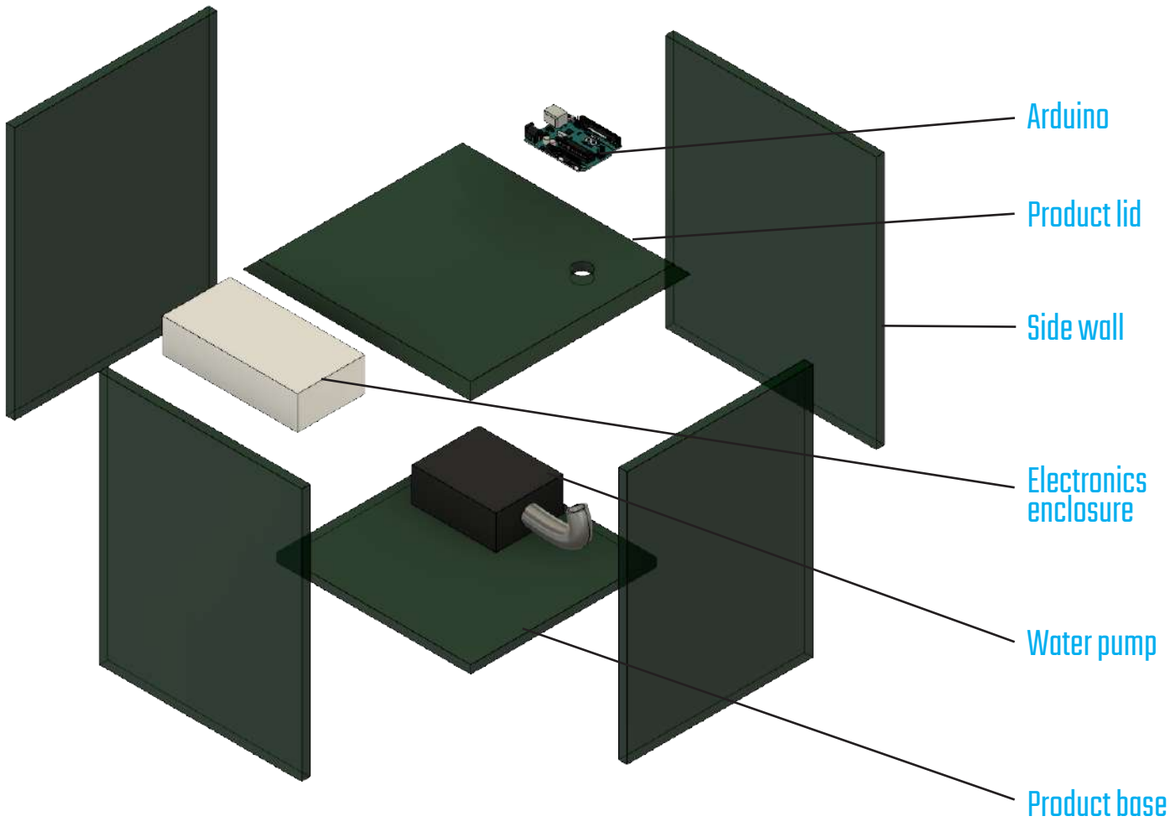


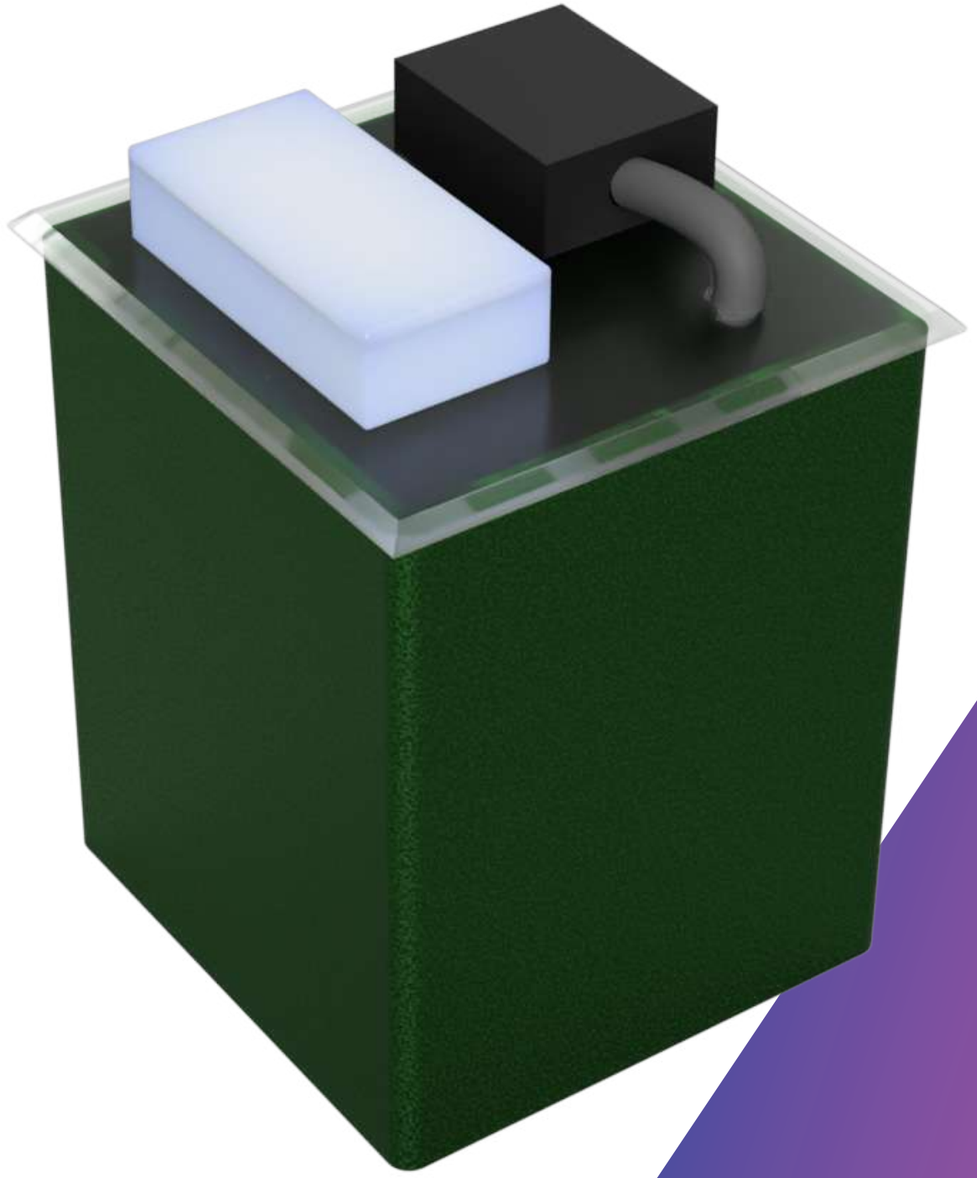




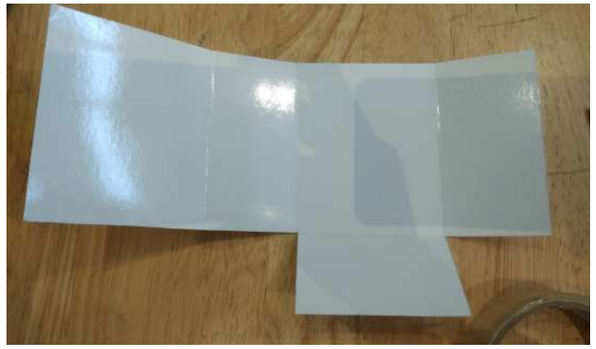


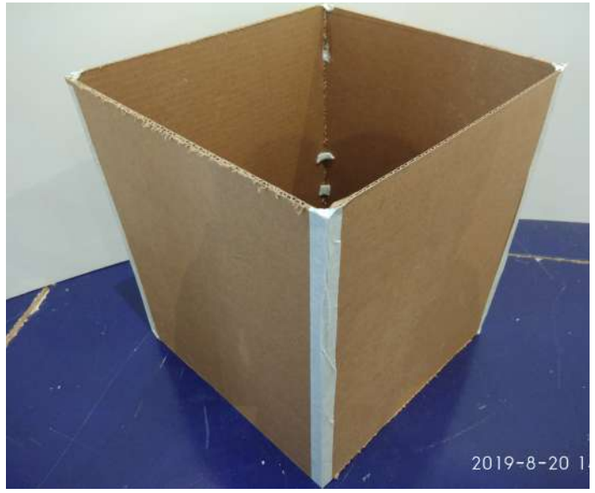
Product Visualization





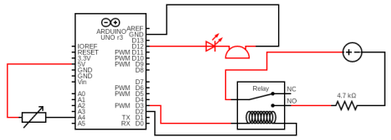
Prototyping

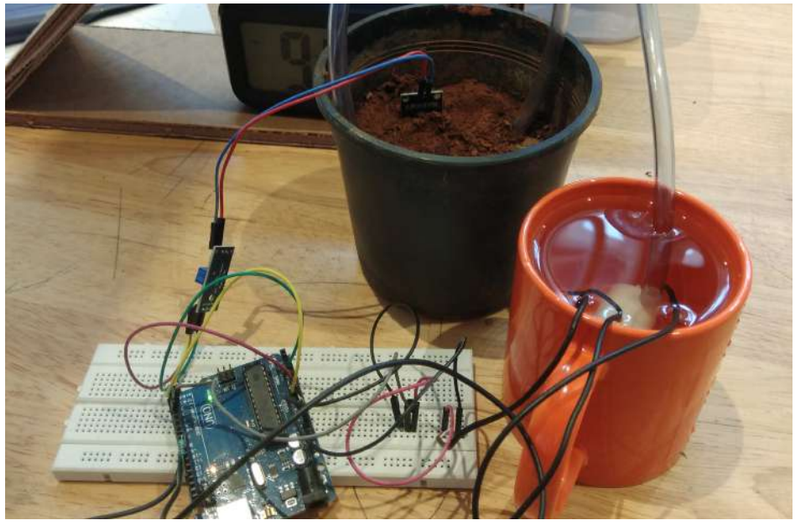


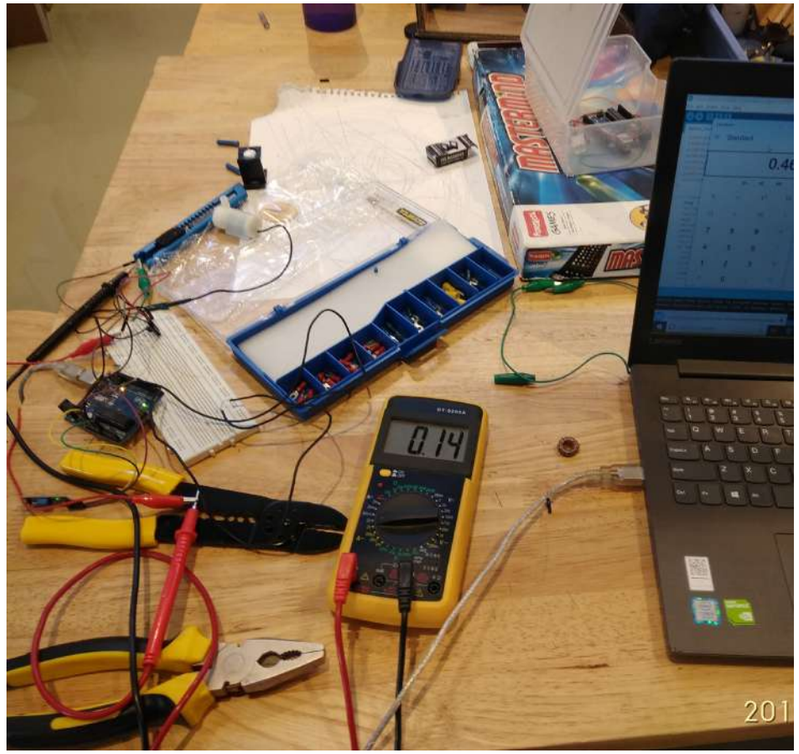


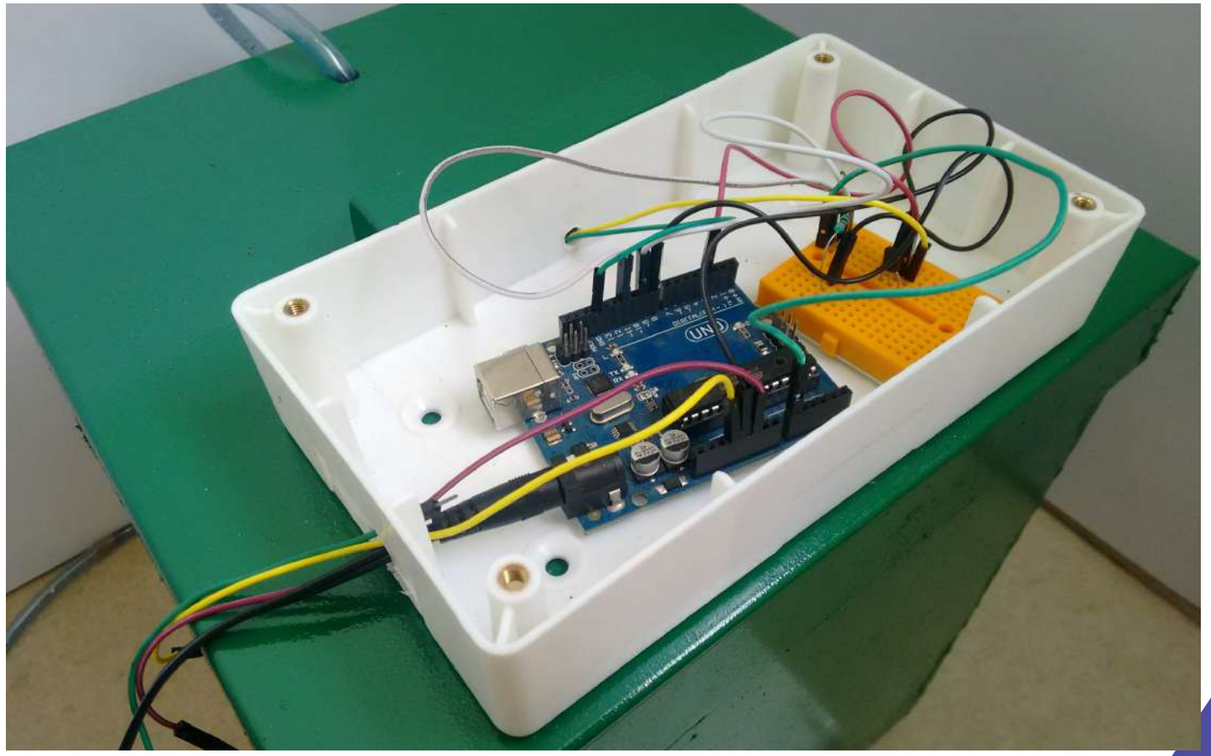
Material Exploration

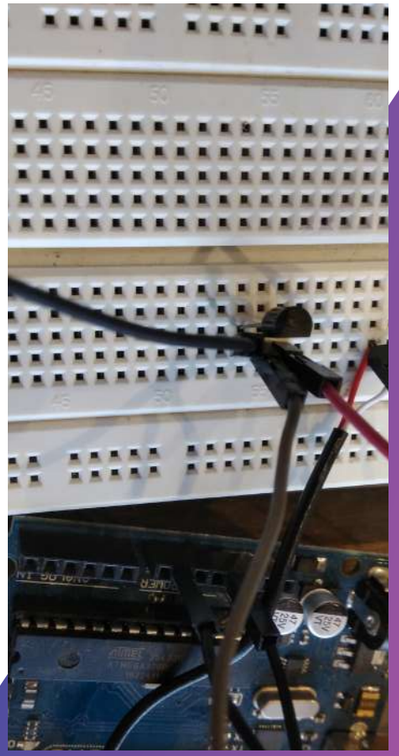
Electronic Prototyping











Finishing

VeBike

Enabling enthusiasts and DIY builders to make their own electric bike

Who is it for?

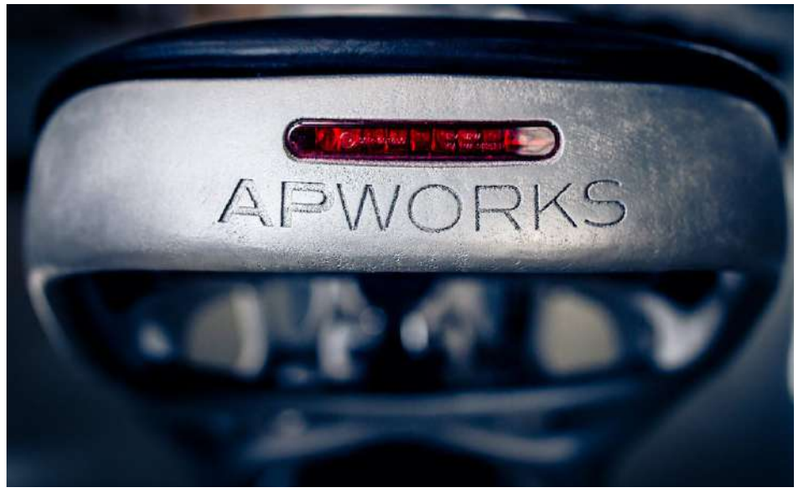
- Environmentalist
- Energetic
- World Traveller
- Entreprenueur
- Video Blogger

Mark Martinsen

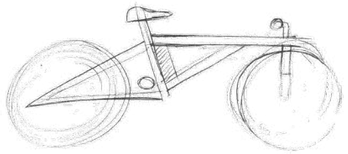
New York, USA

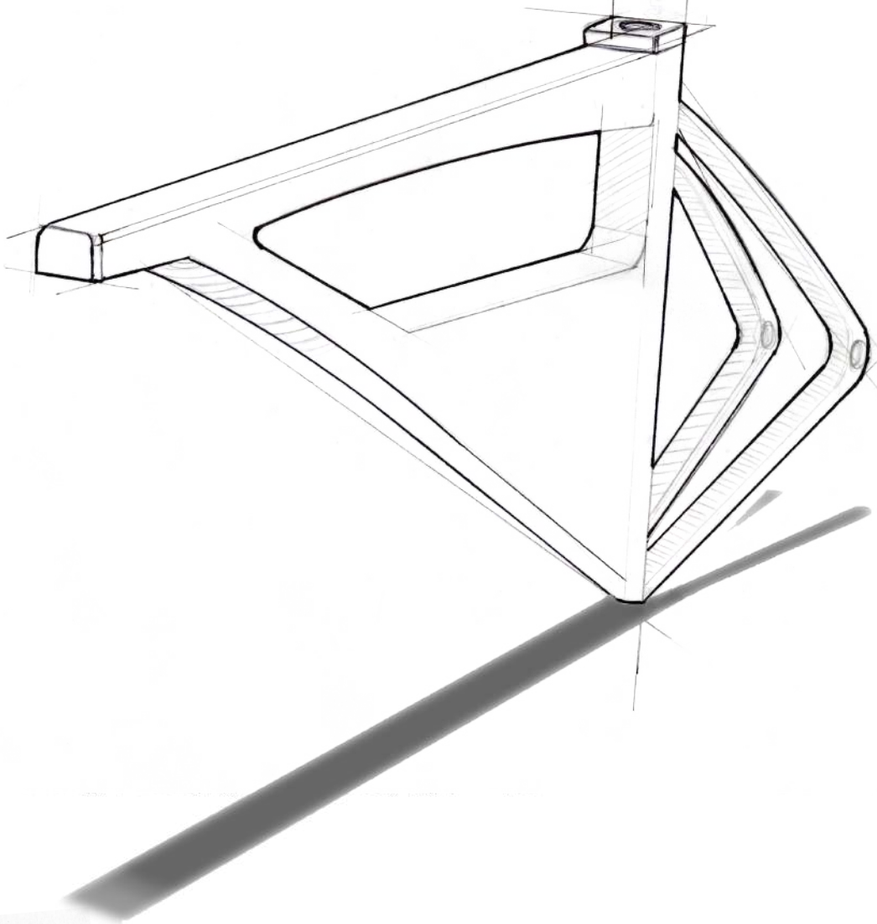
Mark wants to upgrade his bike by making his own e-Bike

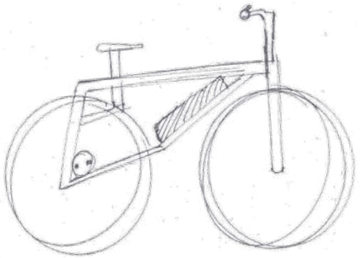
Inspiration

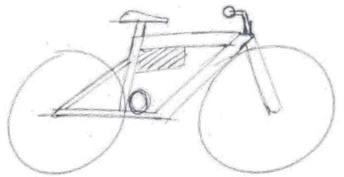


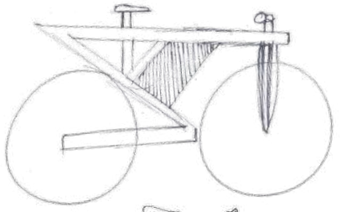
Sketch Ideation

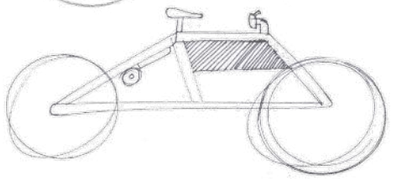


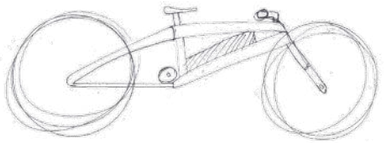


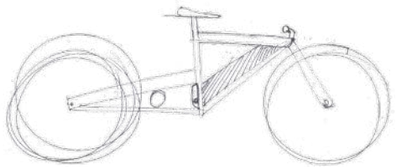


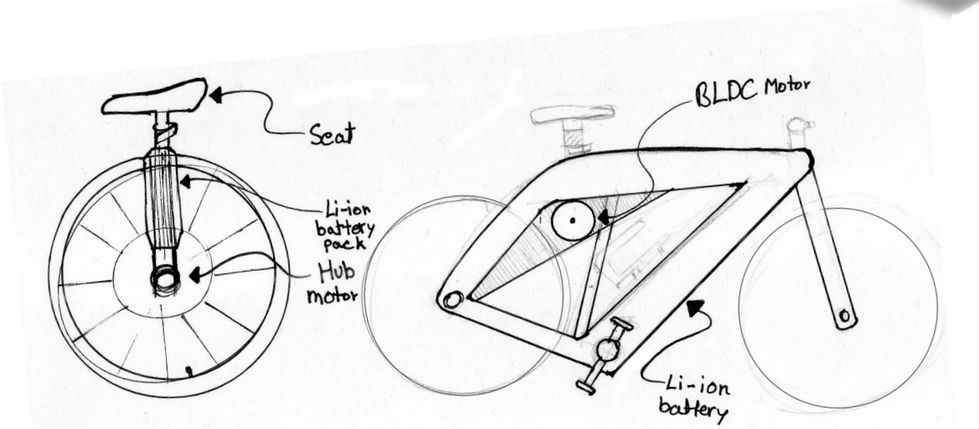


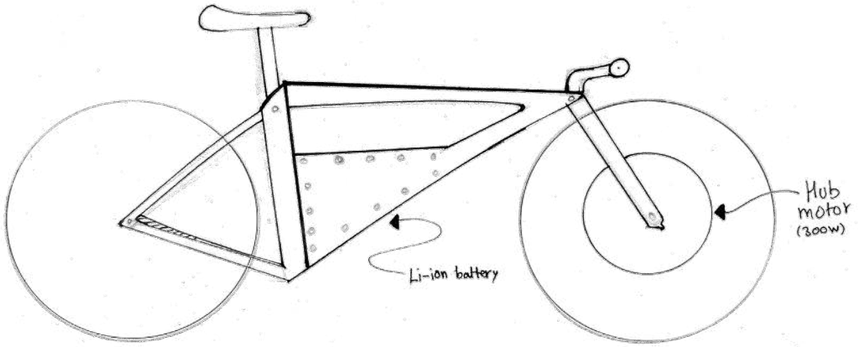




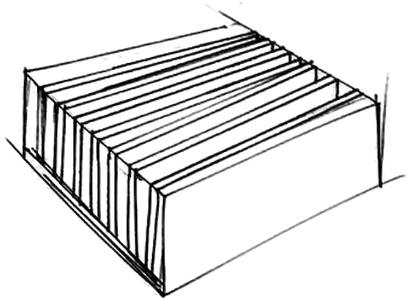




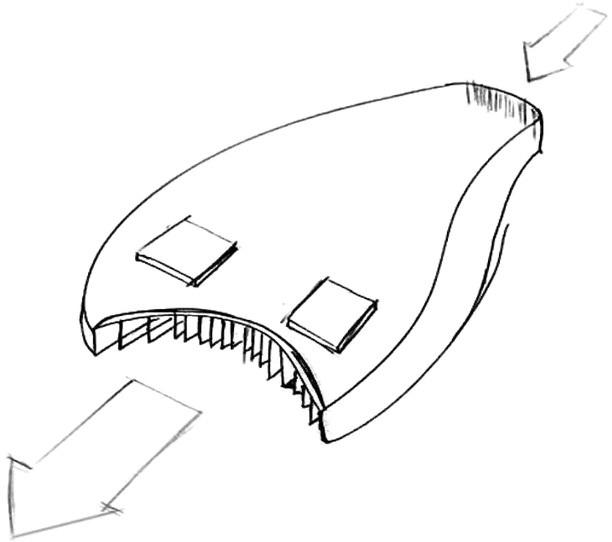


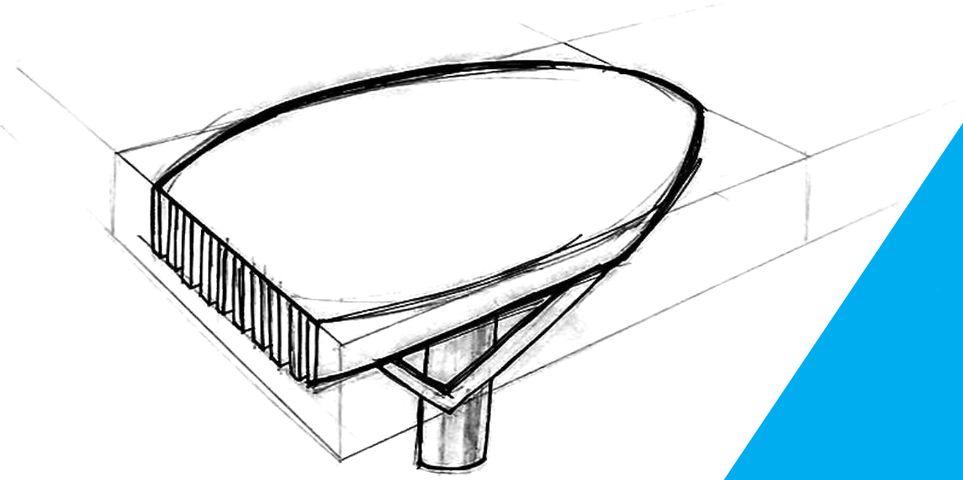


Seat Design

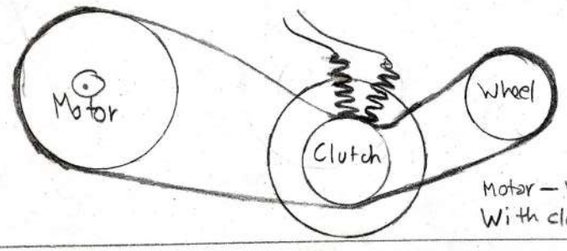


Heat sink

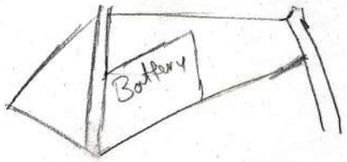




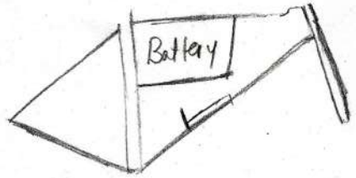
Engineering the Bike



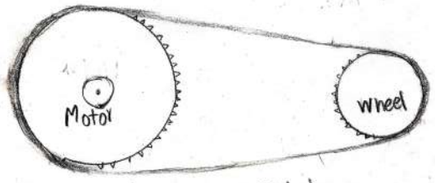
Motor – Wheel mechanism
With clutch



Design 1
→ Low CG

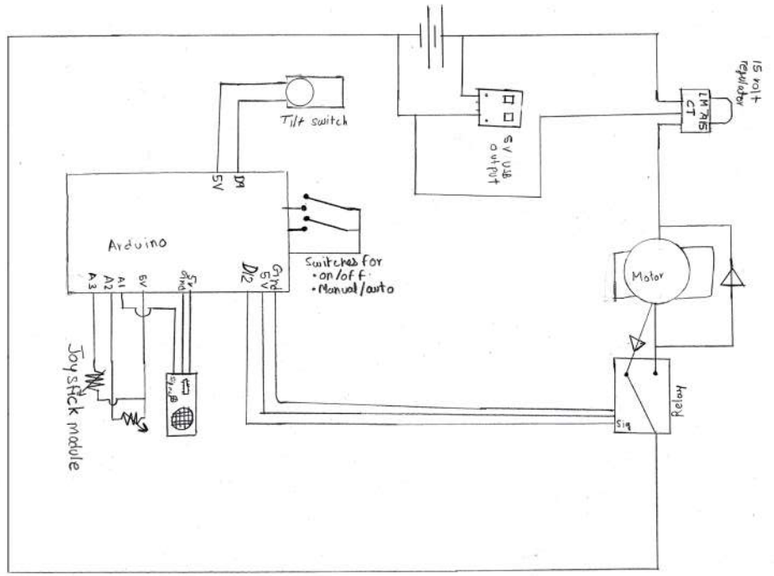


Design 2
→ High CG

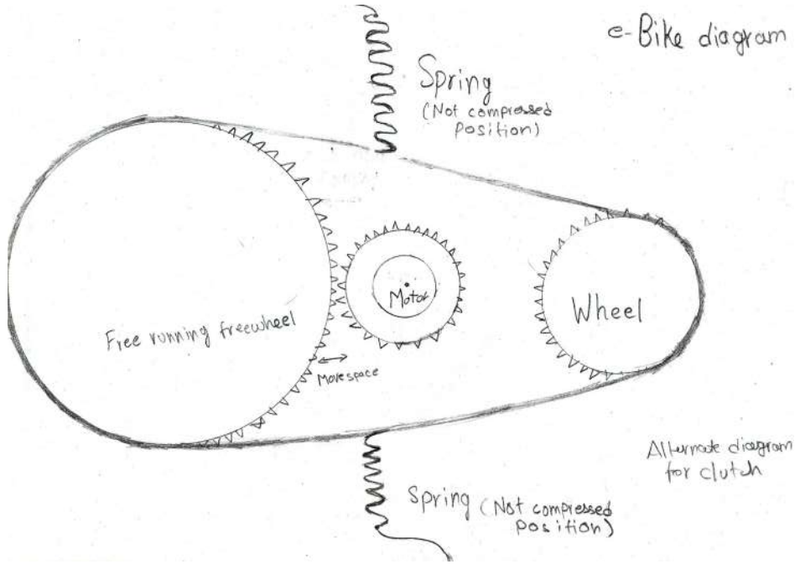


Without Clutch

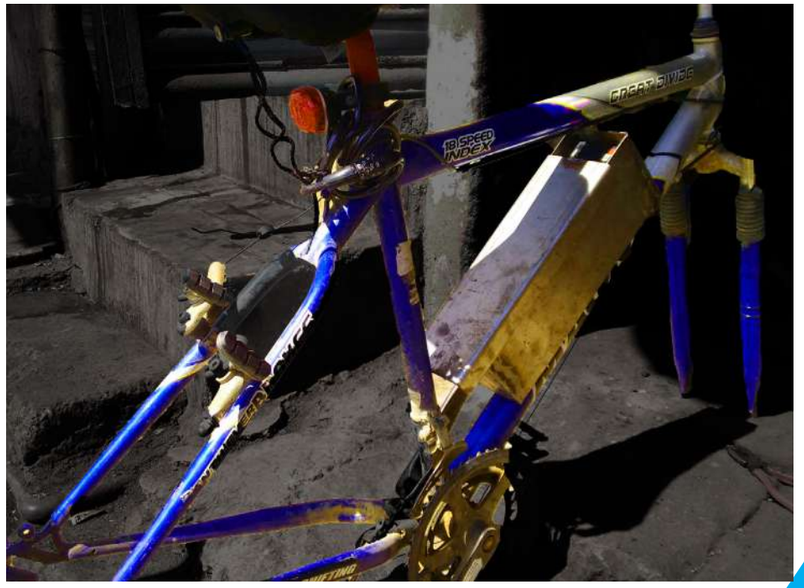
Freewheel diagram



e-Bike diagram

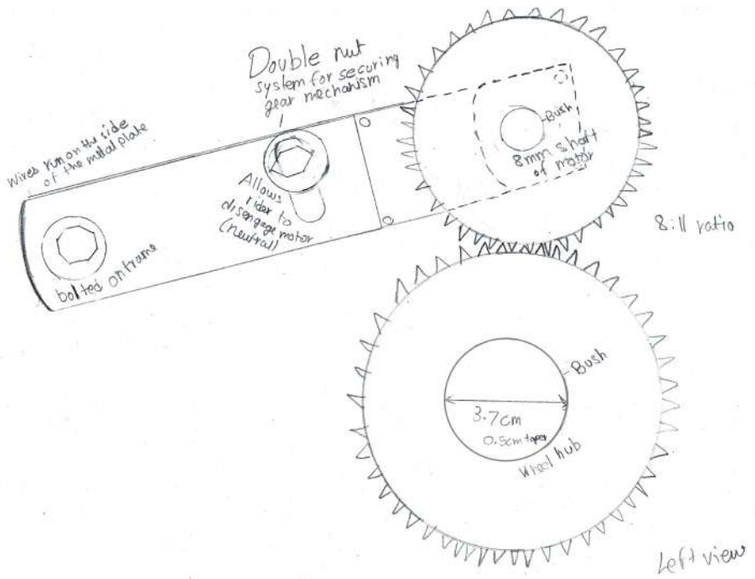


Alternate diagram for clutch

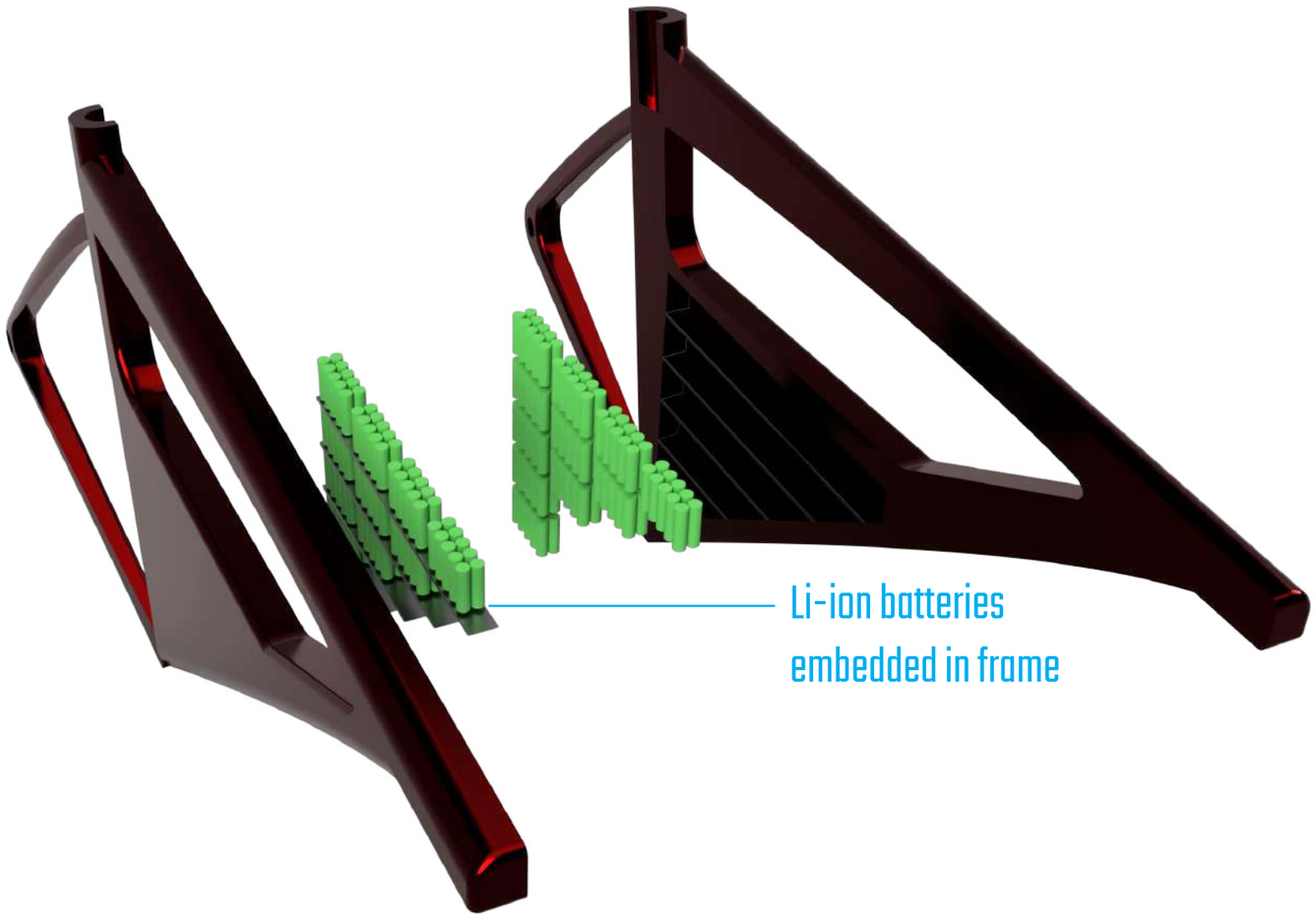


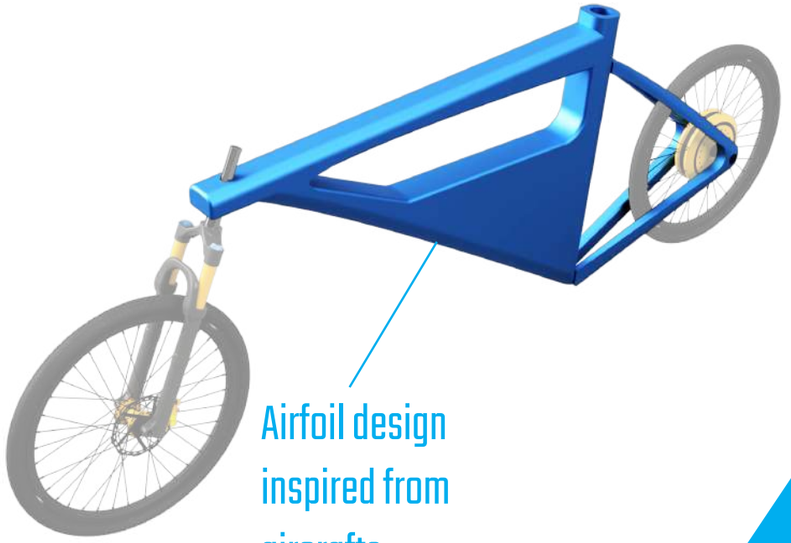
How it Works

- 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

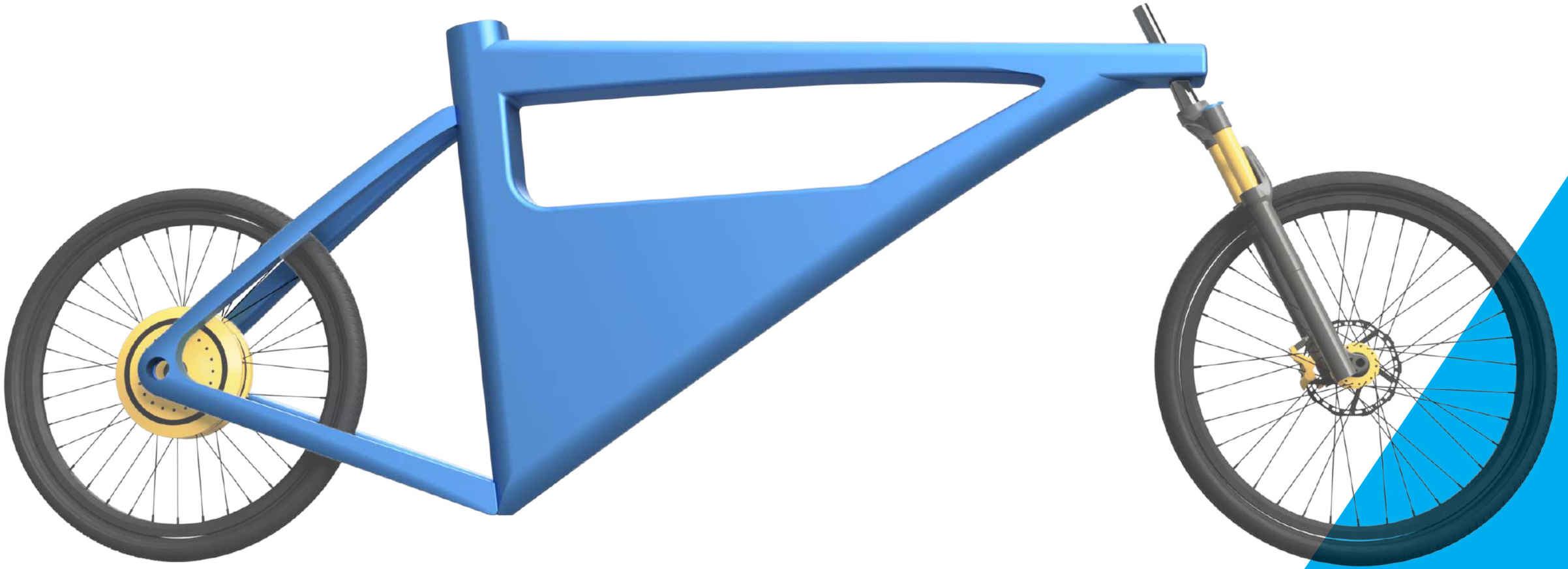


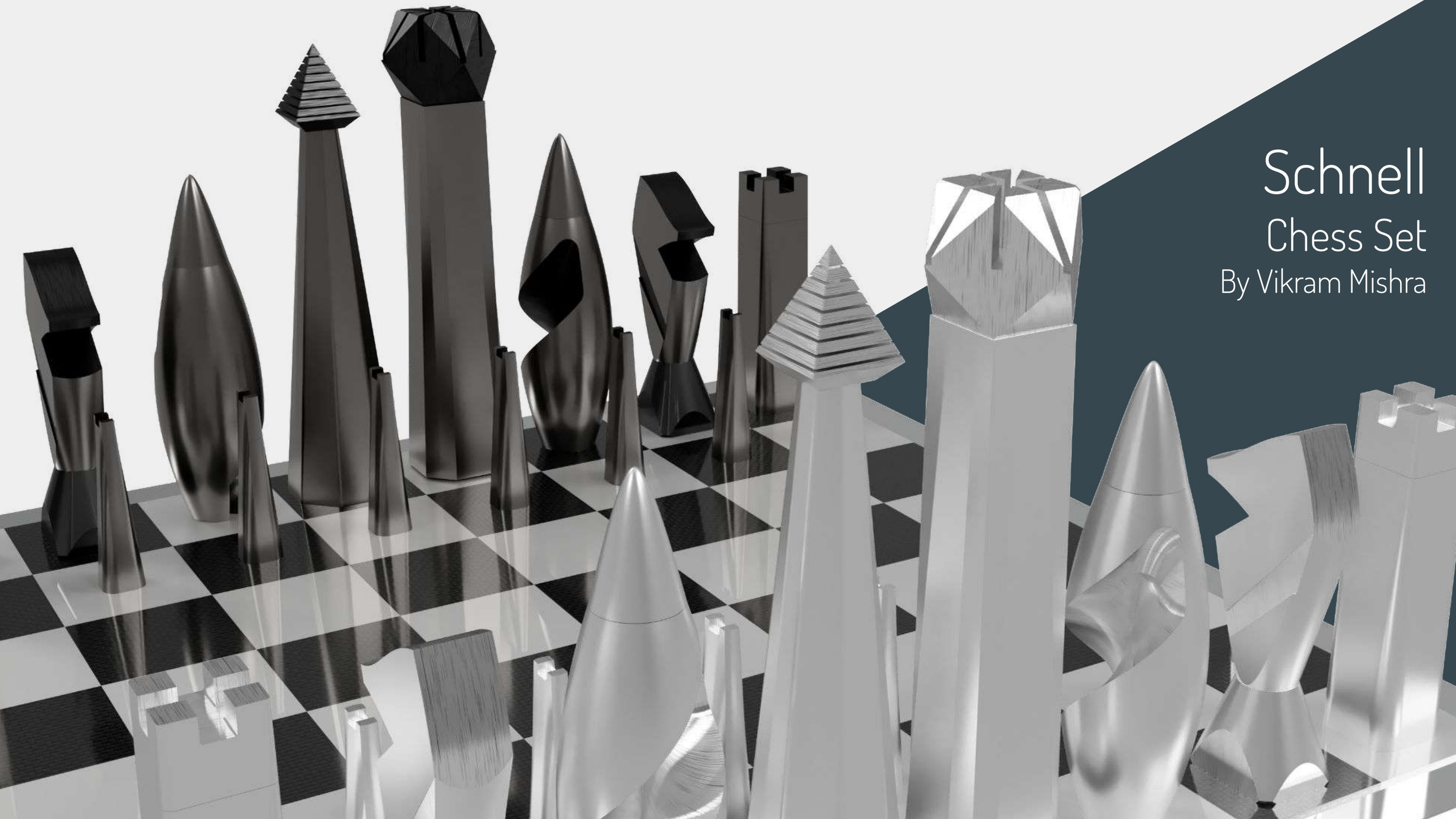
Design Features





VeBike

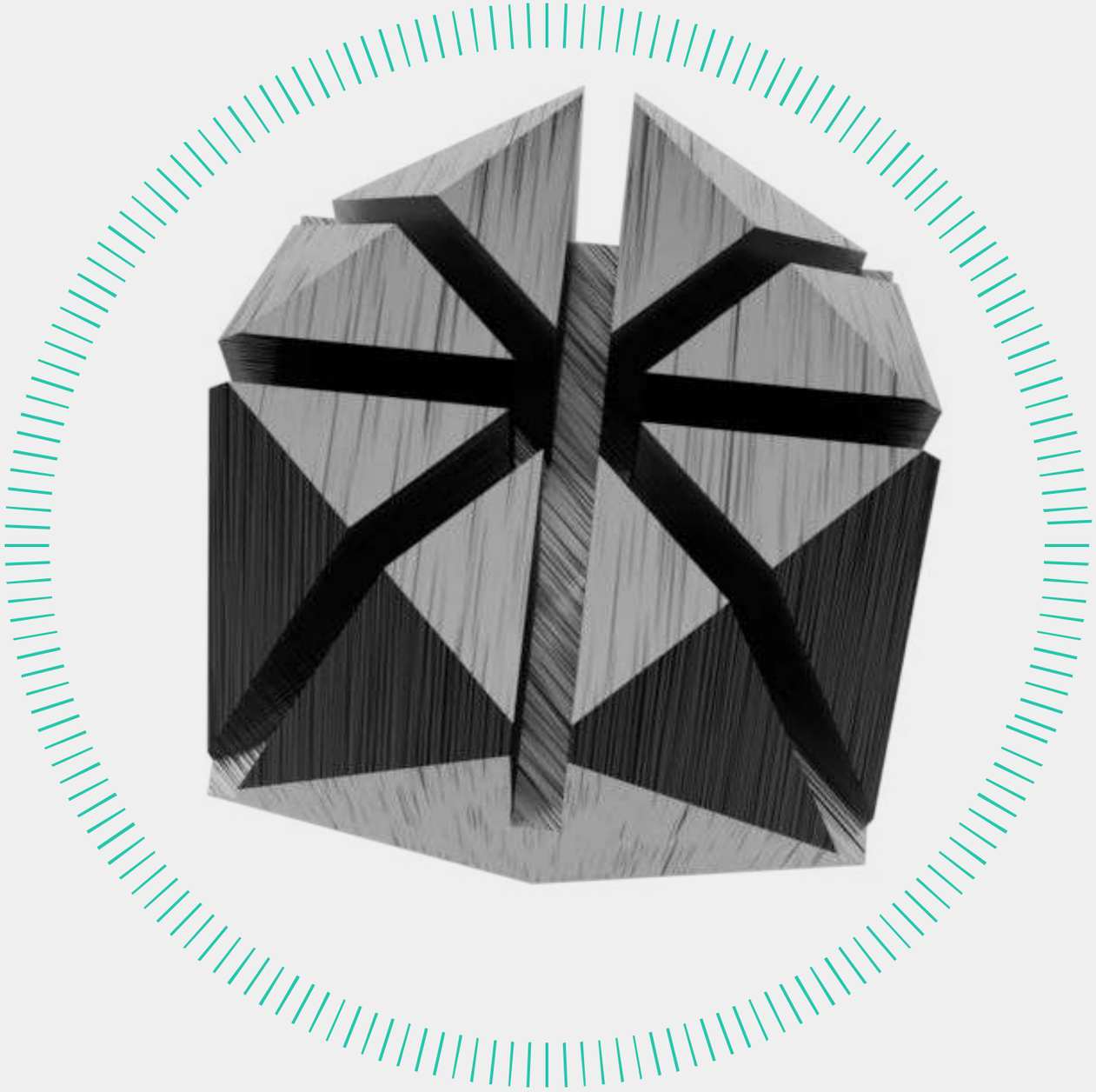




Schnell

Chess Set

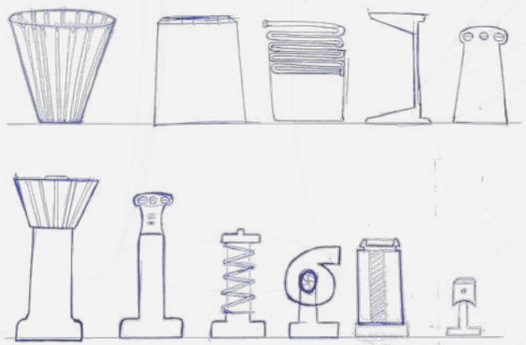
By Vikram Mishra

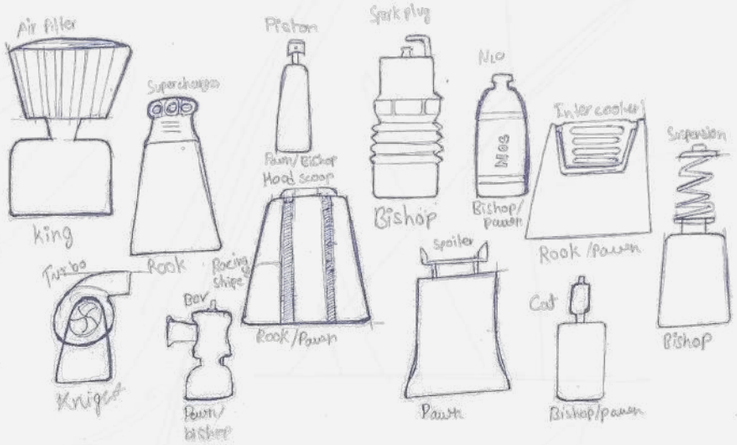


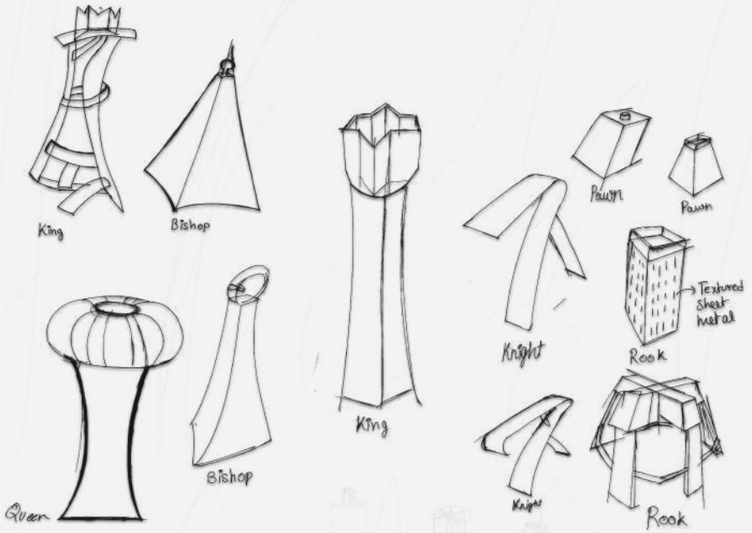
AESTHETIC

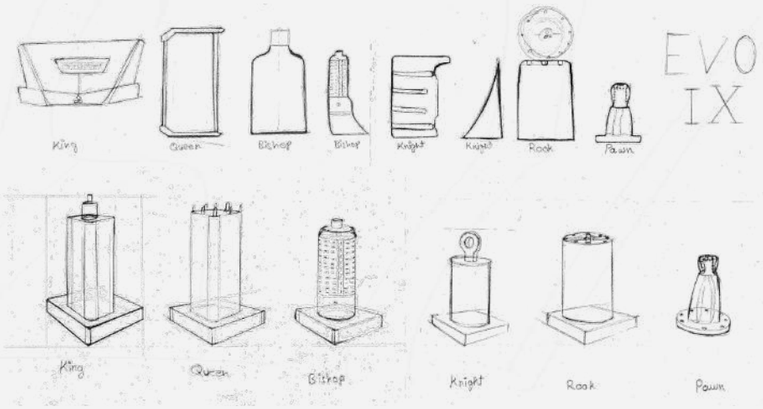
Made from finely machined metal pieces, this chess set will fit in corporate offices of automotive companies and in car showrooms and dealerships, as well as in garages with collectable cars and as a showpiece in cabinets in houses of automobile enthusiasts who enjoy customizing vehicles, especially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

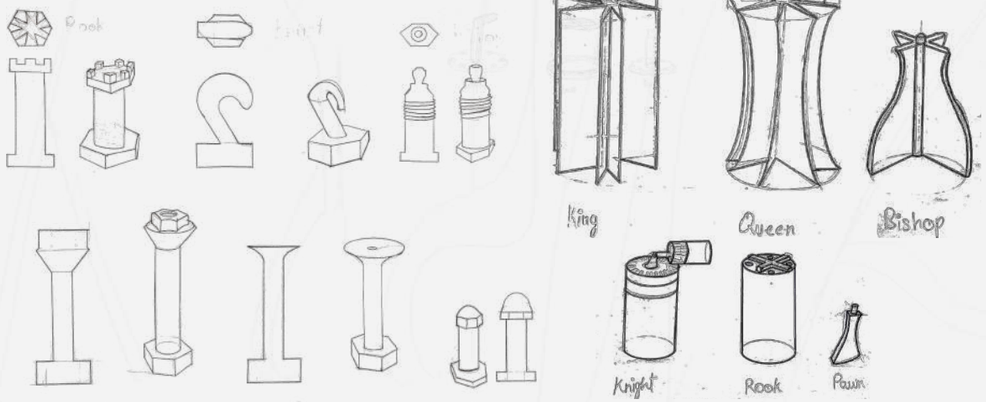
SKETCH EVOLUTION



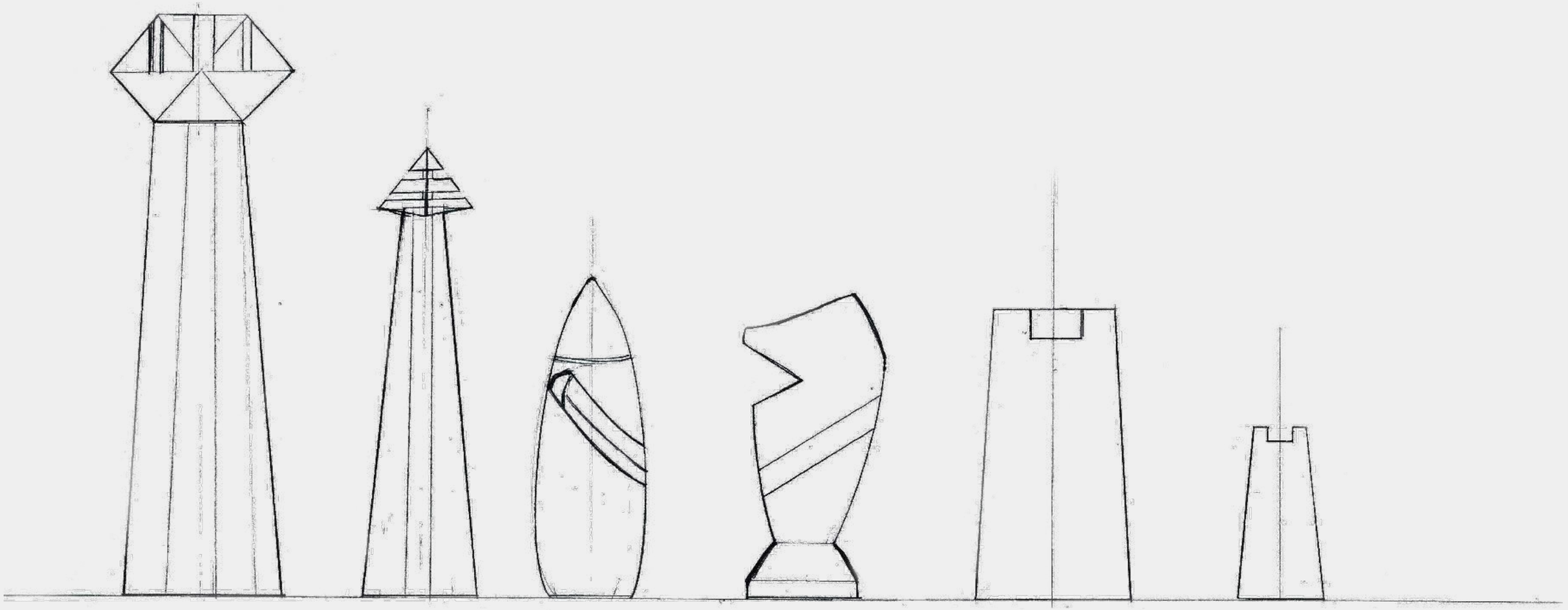


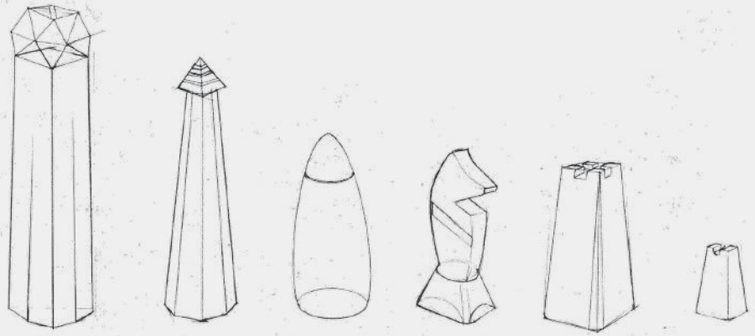




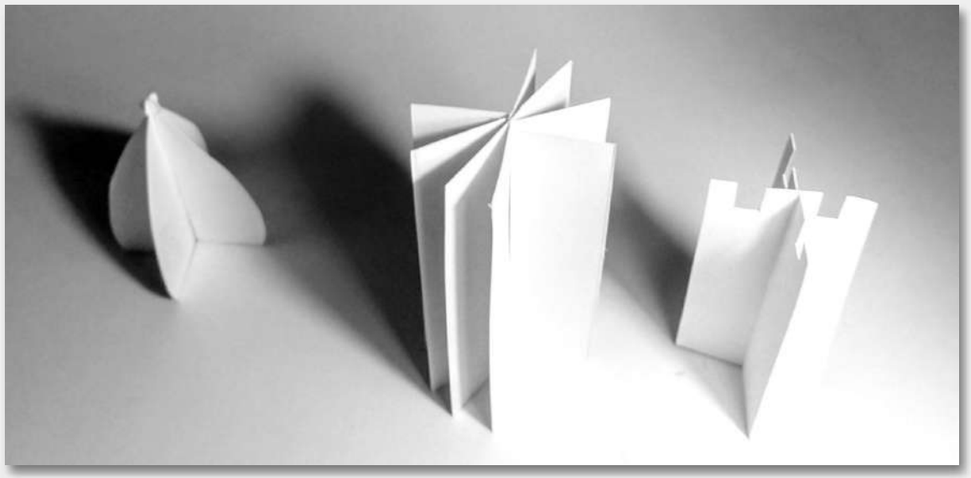


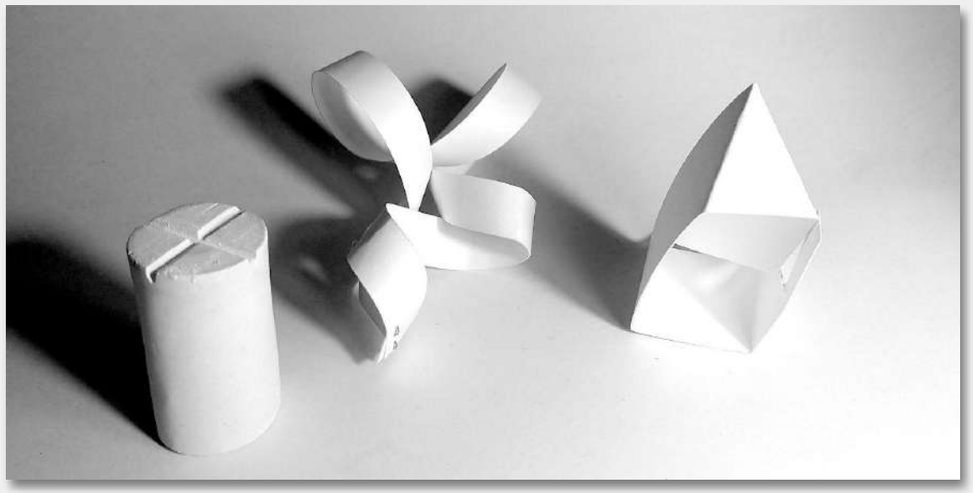
CULMINATION SKETCHES



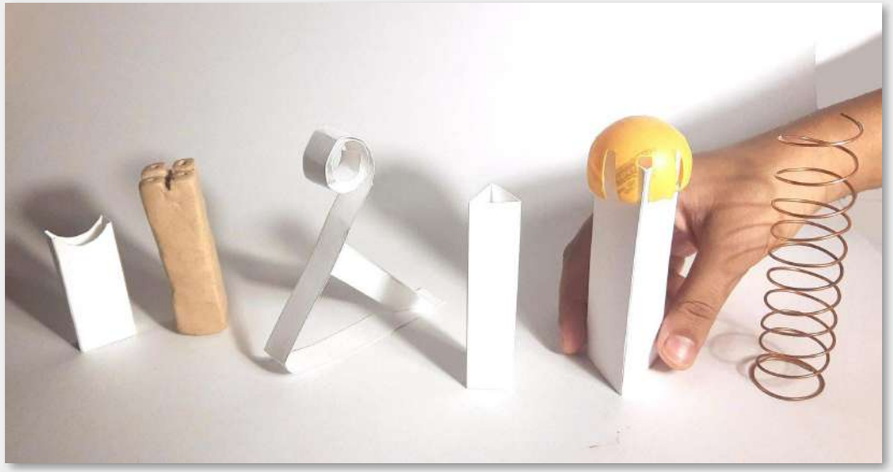


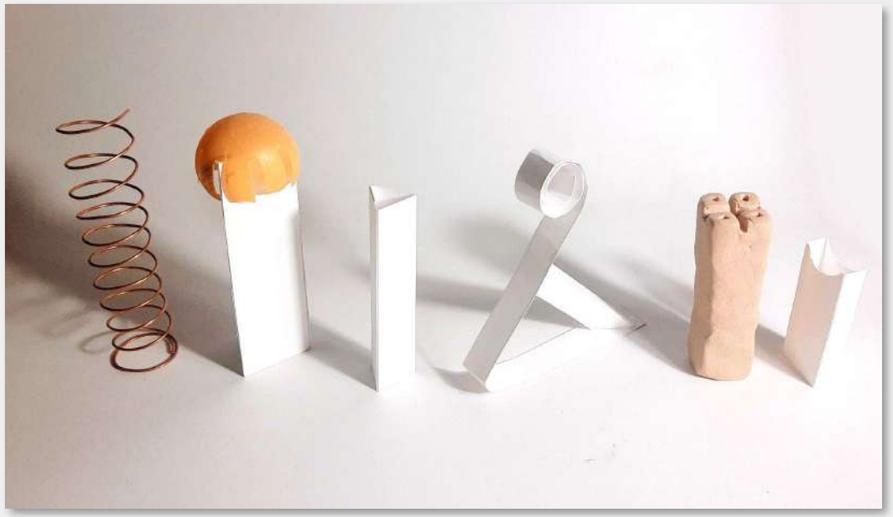
3D SKETCHES





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

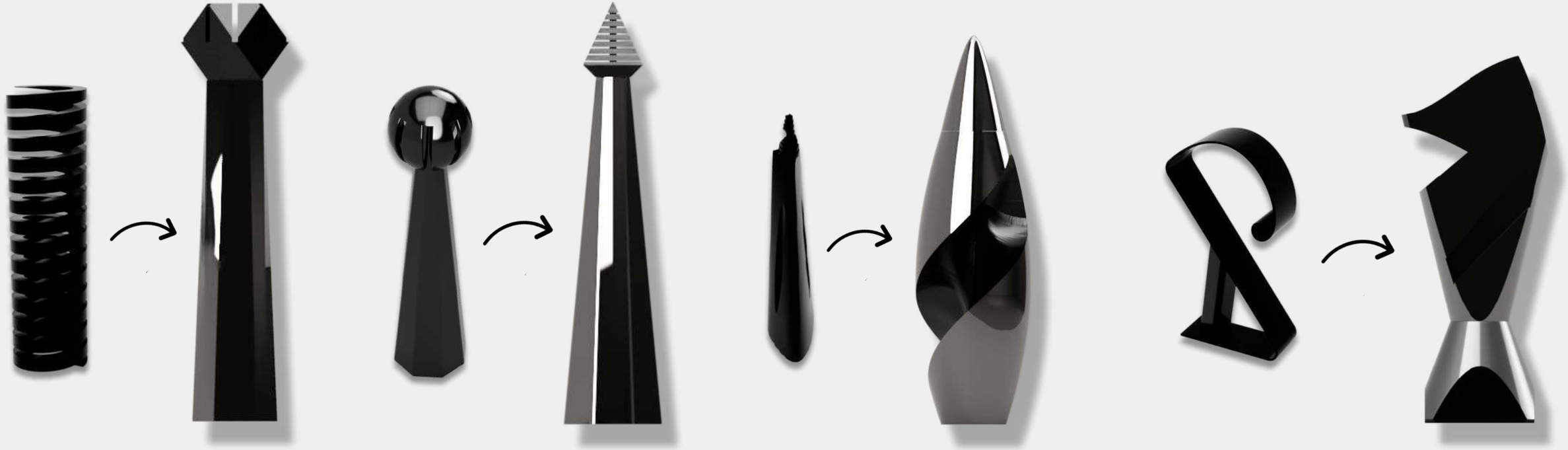
GRASPING

- 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



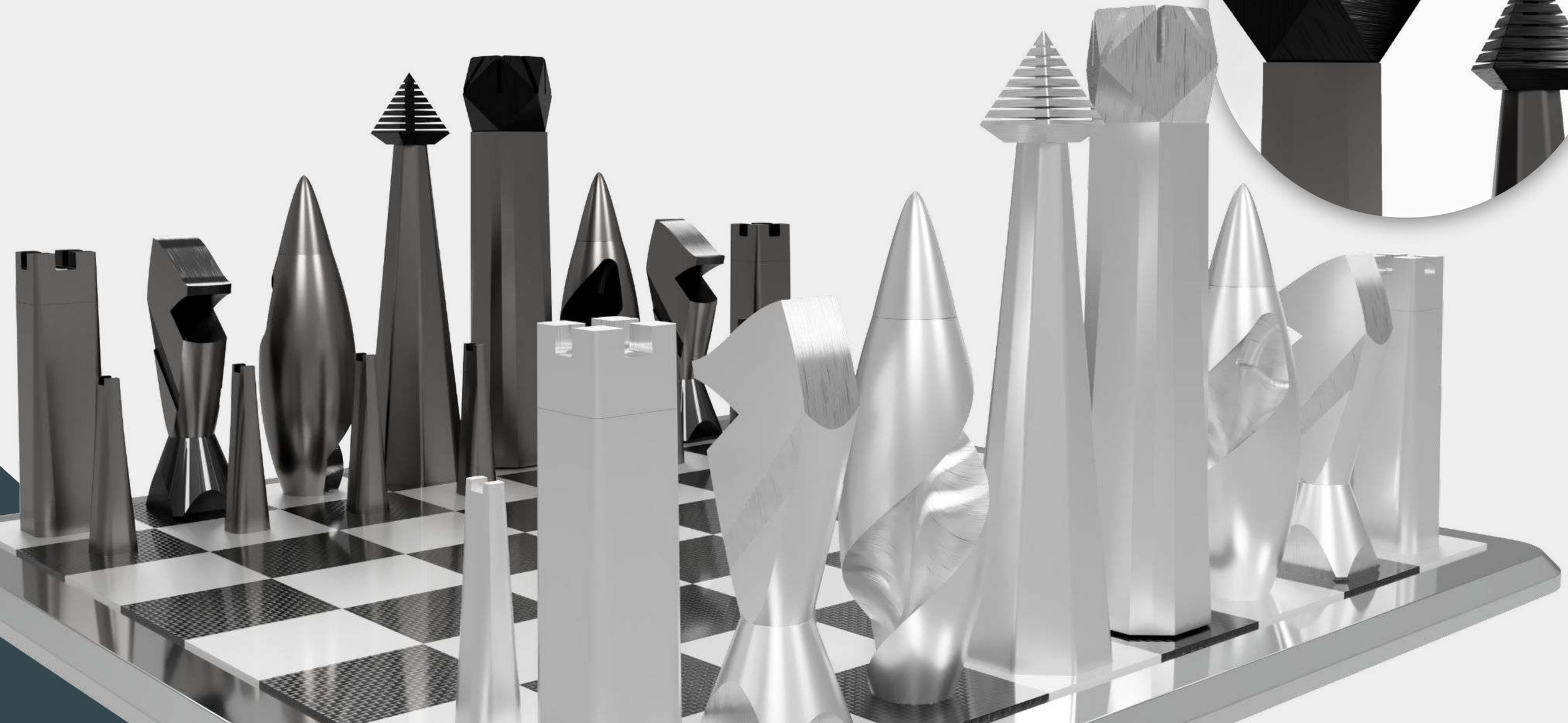
King incorporates idea of a finely machined custom top attached to a casted base
The form becomes more aesthetic

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