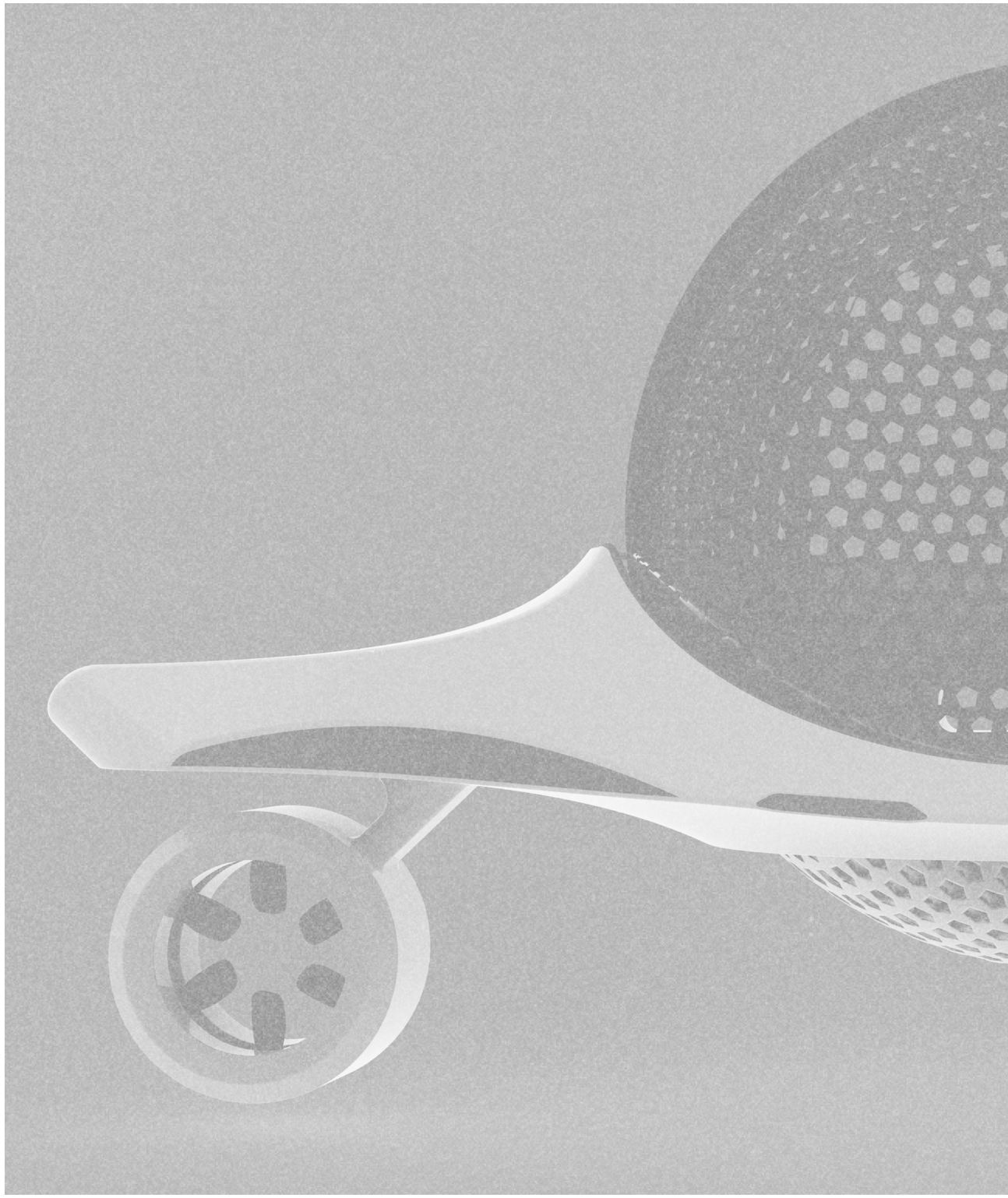
Biomimicry

DE-687

“Marine Garbage Collector Inspired From Dung Beetle”



By
Uppili Nithin Soorya B
216130016

IDC School of Design
अभिकल्प विद्यालय
IIT Bombay

Approval Form

This is to certify that the Design Exploration Seminar entitled "Marine Garbage Collector Inspired From Dung Beetle" by Uppili Nithin Soorya B, Roll No 216130016 is approved for partial fulfillment for the Master of Design degree in Industrial Design.

Digital Signature
Nishant Sharma (i09069)
27-Jul-23 03:02:05 PM

Prof. Nishant Sharma (Project Guide)

IDC School of Design अभिकल्प विद्यालय
IIT Bombay

https://ams.iitb.ac.in/d/115788-1R95Y575RQQ1UKUN

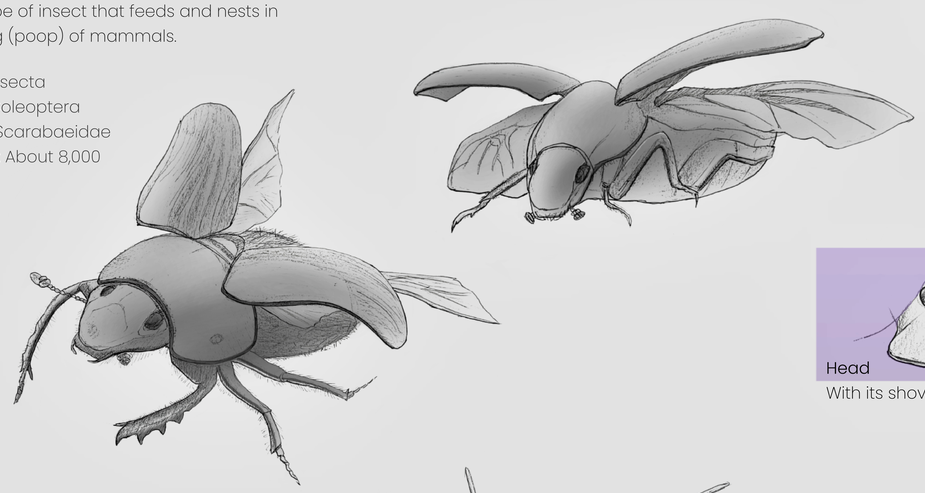
Uppili Nithin Soorya | 216130016

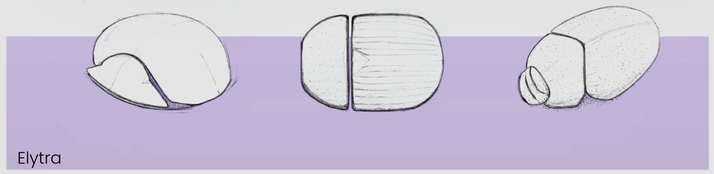
DUNG BEETLE

The Poop Rollers

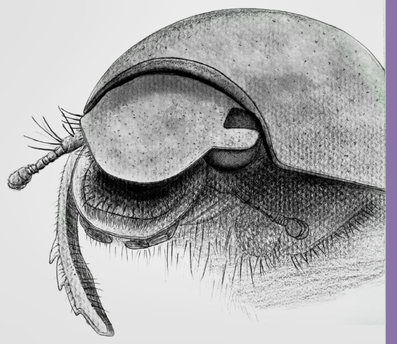
Tumble bugs, also known as dung beetles, are a type of insect that feeds and nests in the dung (poop) of mammals.

Class : Insecta
Order : Coleoptera
Family : Scarabaeidae
Species : About 8,000





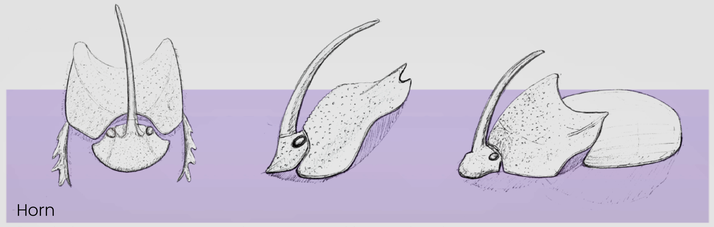
Elytra
Protecting the beetle against an array of harsh environmental factors, while also protecting their hindwings from damage.



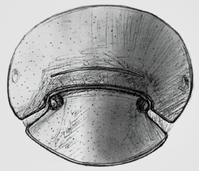
Head
With its shovel like head as its tool it cuts the dung into a ball.

Weight lifters
Dung beetles can carry 1,141 times their own weight!

In search of dung
A dung beetle may fly 30 miles to find dung.

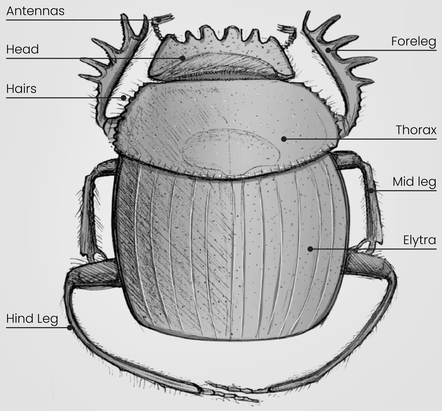


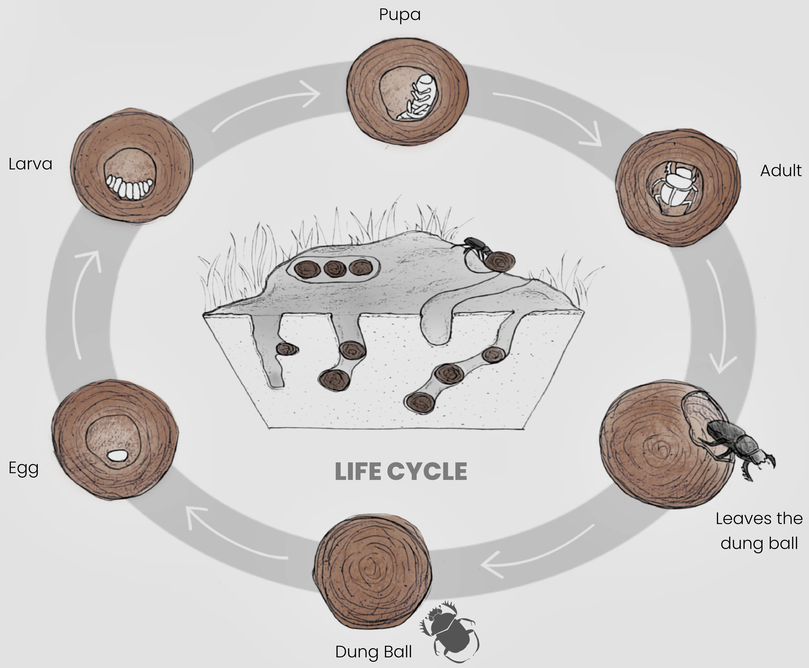
Horn
Beetle horns are weapons: they are used in combat between rival males over access to females.



Head

Growth
Many of the male dung beetles have distinct horns.





Attracted to fresh, smelly dung.

Milkyway
Study shows that dung beetles navigate via the Milky Way, the first known species to do so in the animal kingdom.

What does dung beetle eat?
The dung beetle eats vegetative matter that's left in the feces of herbivorous animals. They are predominantly scavengers with occasional carnivorous tendencies.

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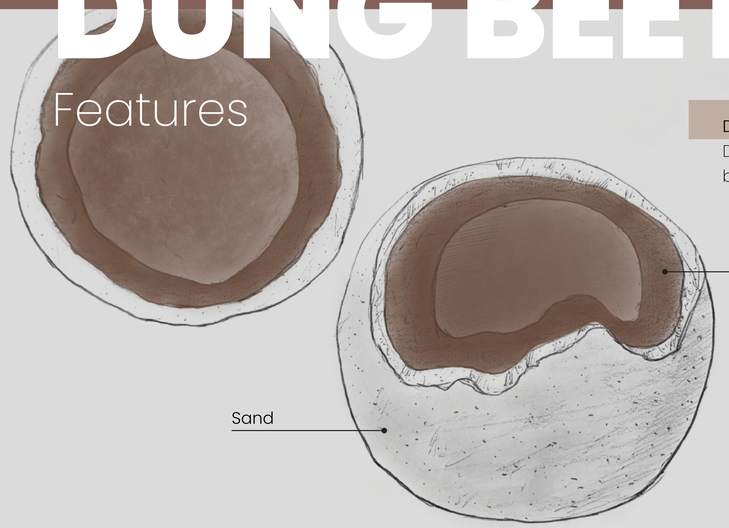
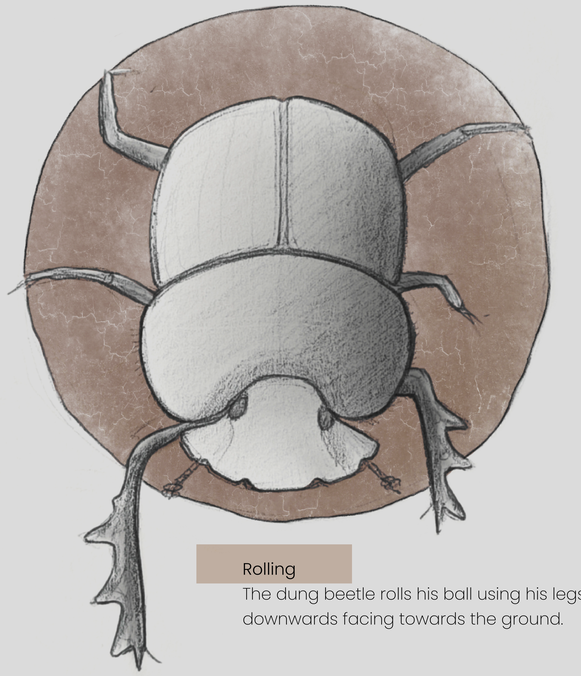
DUNG BEETLE

Features

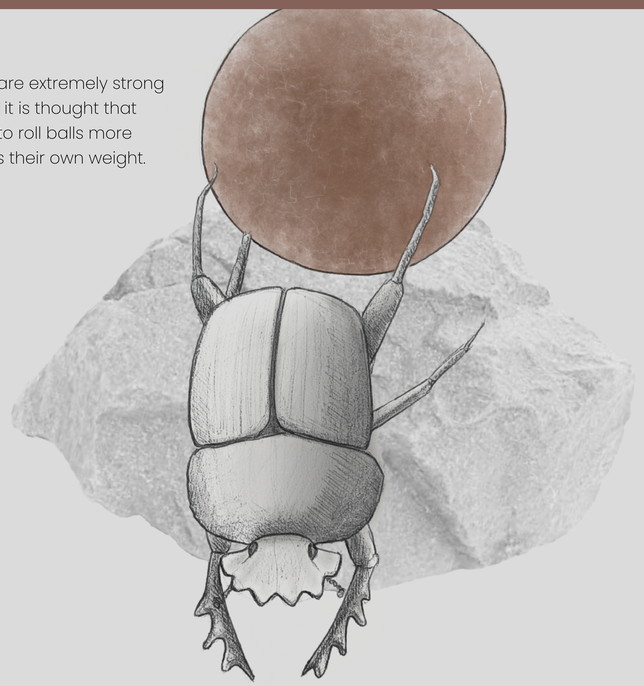


Dung Ball
Dung balls that were buried by the beetle and dug up by a predator.



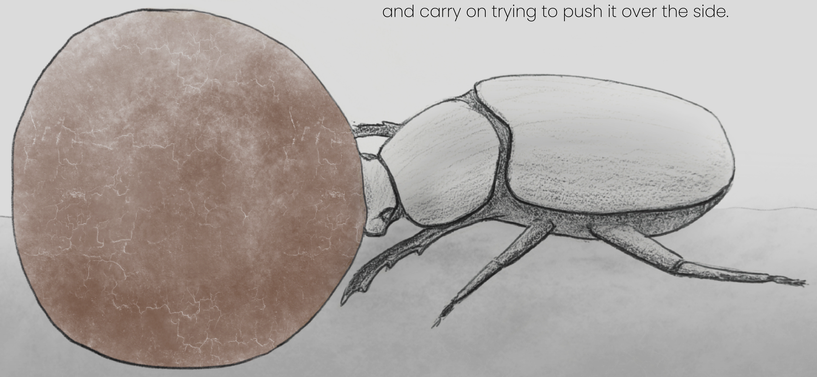
Rolling
The dung beetle rolls his ball using his legs, with his head turned downwards facing towards the ground.

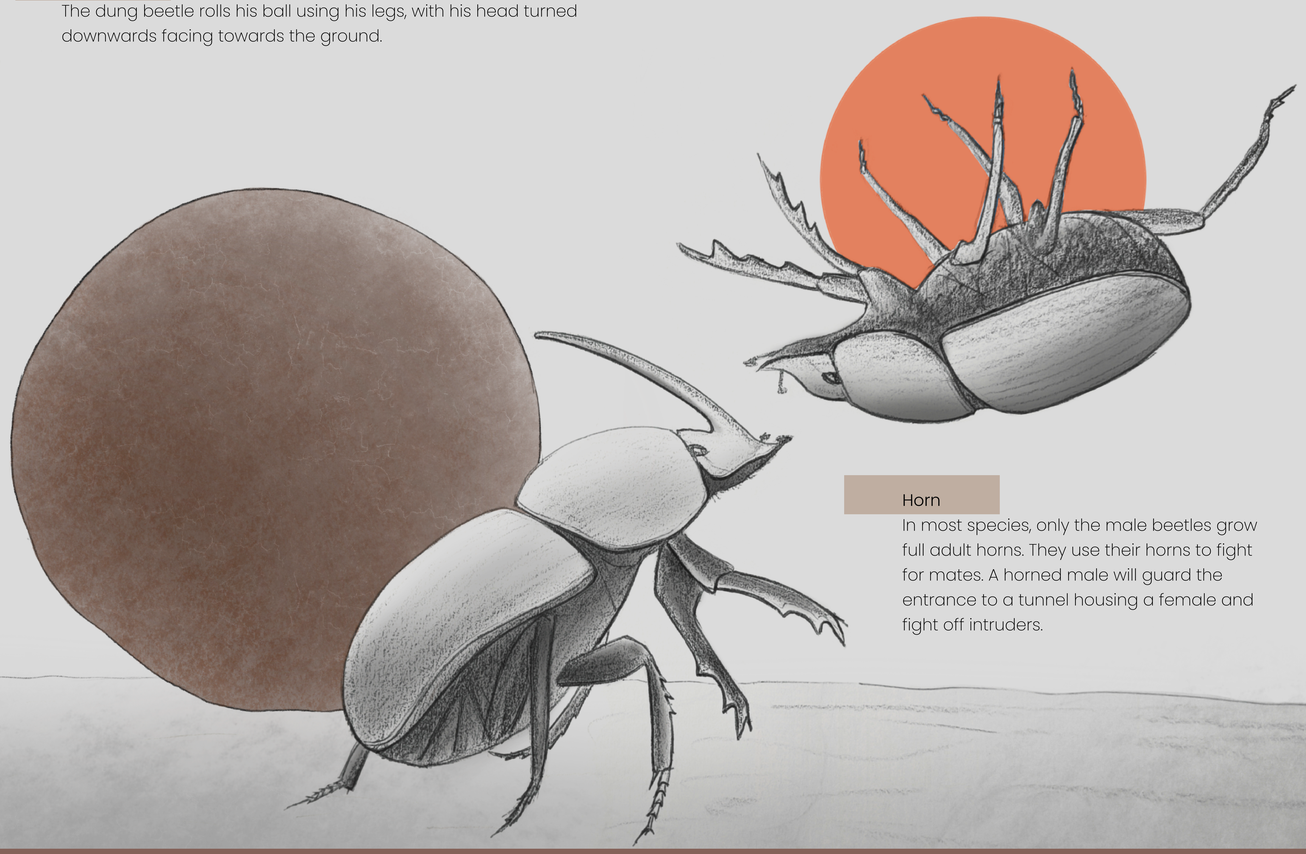
Strong
Dung beetles are extremely strong creatures and it is thought that they are able to roll balls more than fifty times their own weight.



Laying egg
The two beetles mate and the female lays her eggs inside the dung ball.

Untiring
The dung beetles never seem to give up and do not seem to be defeated by this, but just start all over again and carry on trying to push it over the side.

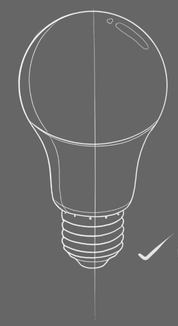




Horn
In most species, only the male beetles grow full adult horns. They use their horns to fight for mates. A horned male will guard the entrance to a tunnel housing a female and fight off intruders.

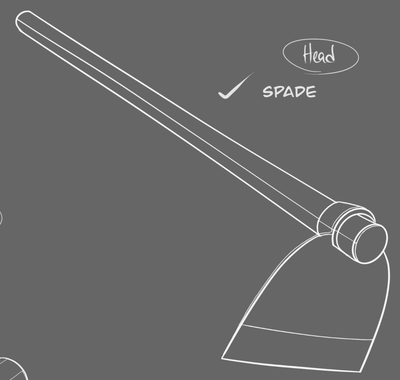
DUNG BEETLE

Possible Applications



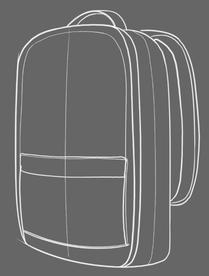
✓ LED BULB

Light



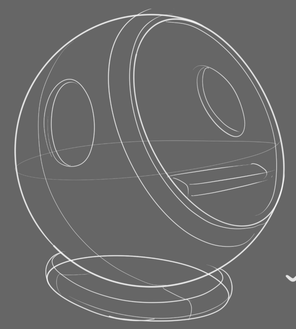
✓ SPADE

Head



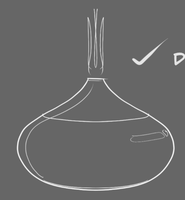
✓ BACKPACK

Shell



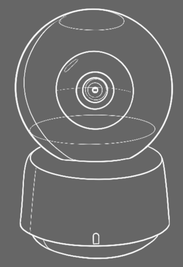
✓ POD CHAIR

Dung Ball



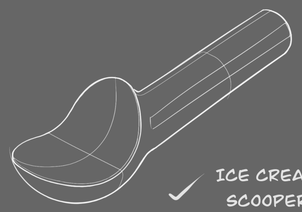
✓ DIFFUSER

Dung Ball



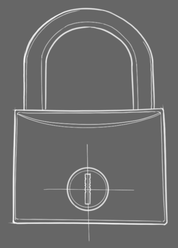
✓ WEBCAMERA

Rolling



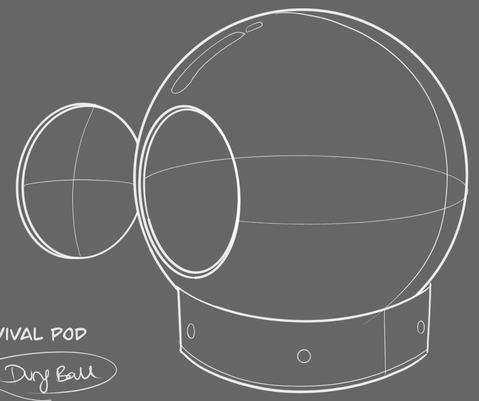
✓ ICE CREAM SCOOPER

Head



✓ LOCK

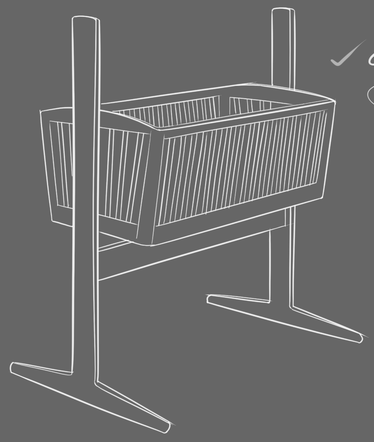
Shell



✓ SURVIVAL POD

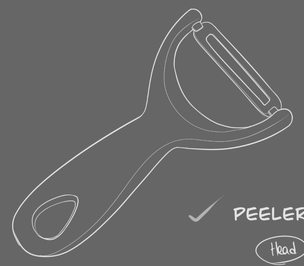
Dung Ball

Dung Ball ✓ HELMET



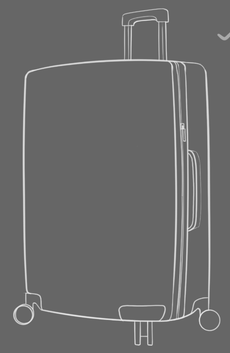
✓ CRADLE

Dung Ball



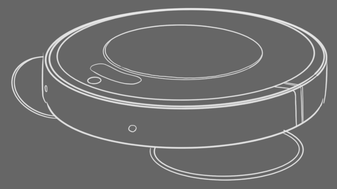
✓ PEELER

Head



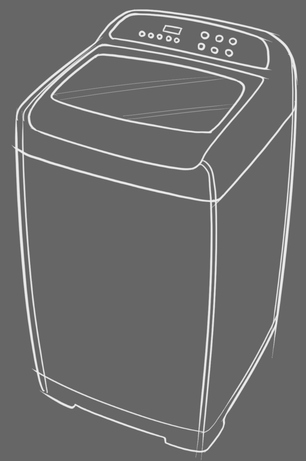
✓ TROLLEY BAG

Shell



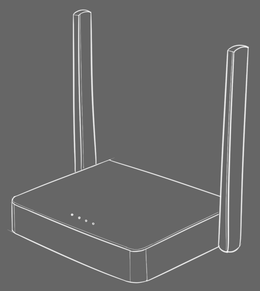
✓ VACUUM CLEANER

Form



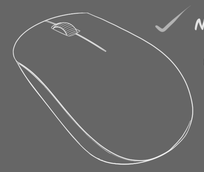
✓ WASHING MACHINE

Rolling



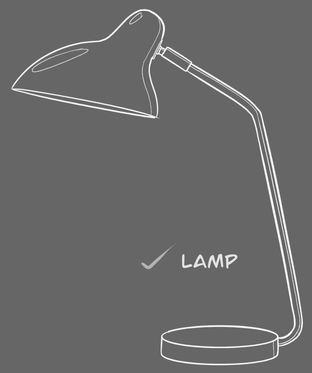
✓ ROUTER

Horn

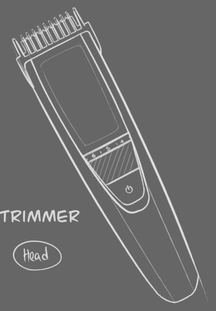


✓ MOUSE

Form

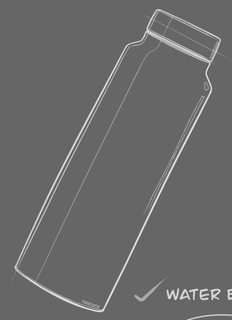


✓ LAMP



✓ TRIMMER

Head



✓ WATER BOTTLE

Dung Ball

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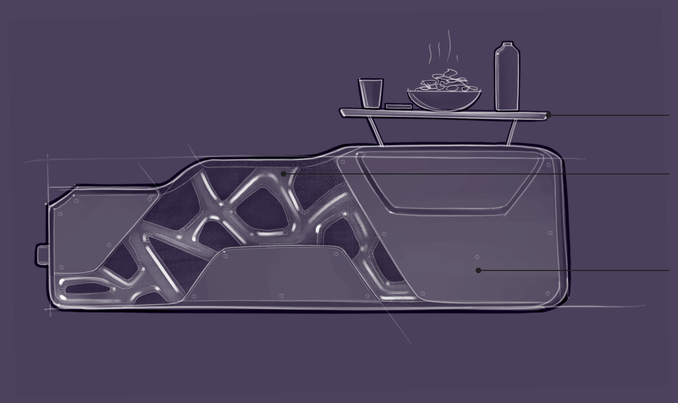
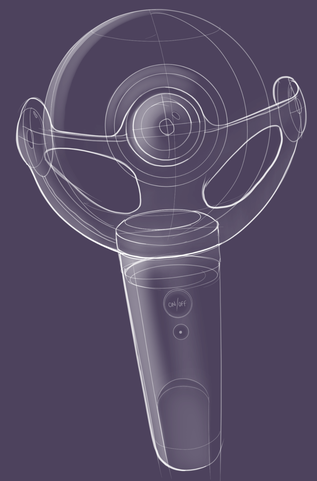
DUNG BEETLE

Concept Ideations

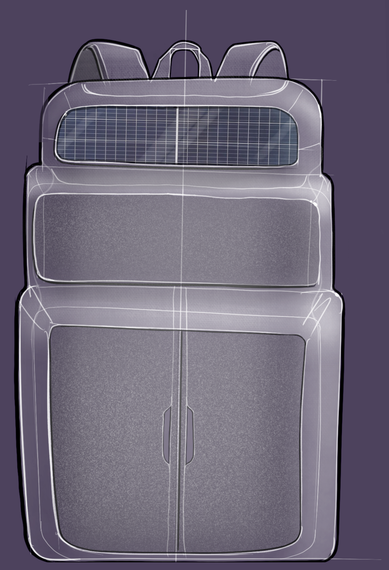
Inflatable Cushioning
Air cushioning to protect the contents of the backpack.

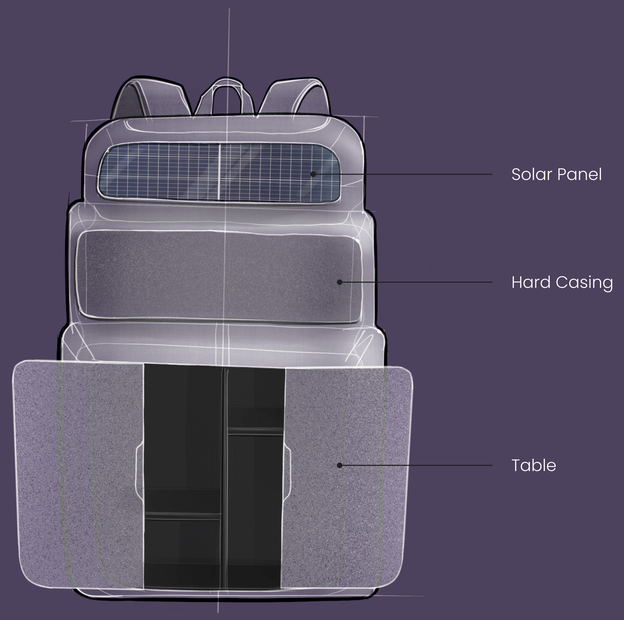


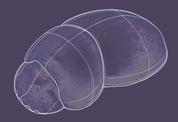


Camera
A GoPro camera with interchangeable lenses.

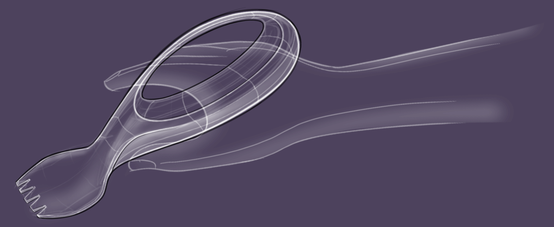
Backpack
Backpack inspired by dung beetles, equipped with solar panel and table.

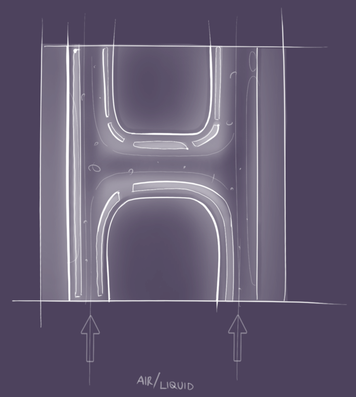


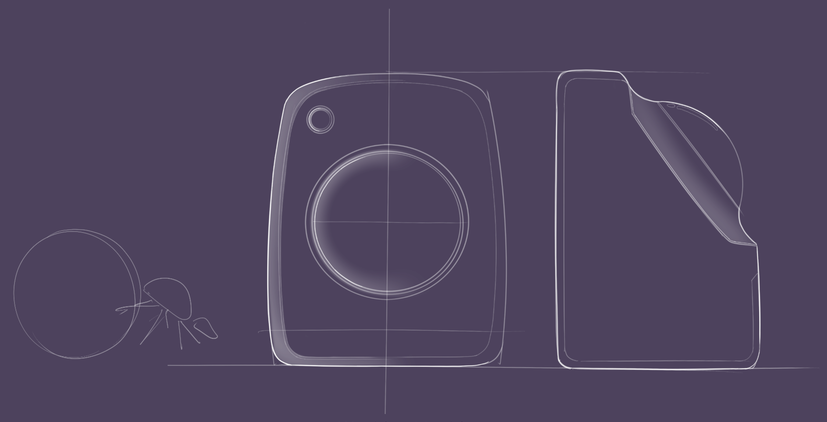




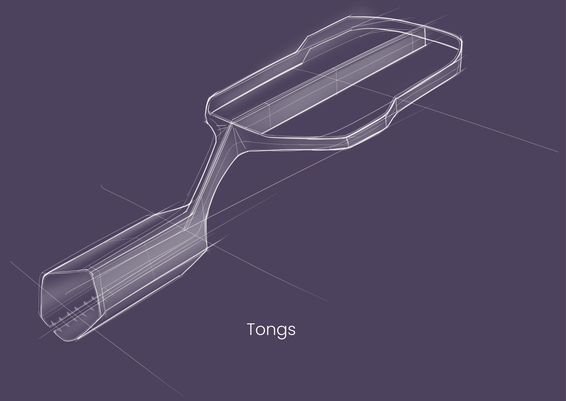
Aid Utensil
Dung beetle-inspired utensils for patients with Parkinson's disease.







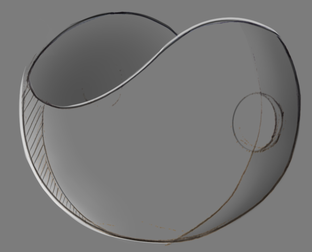
Washing Machine



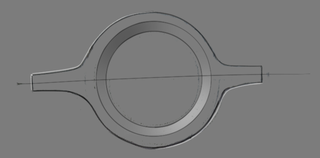
Tongs

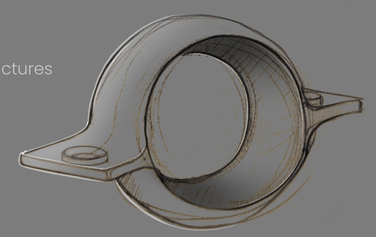
DUNG BEETLE

Concept Sketches & Models

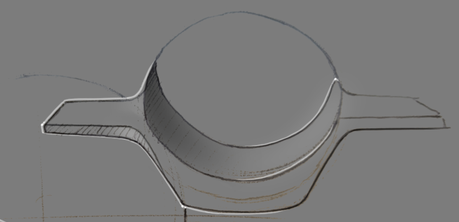


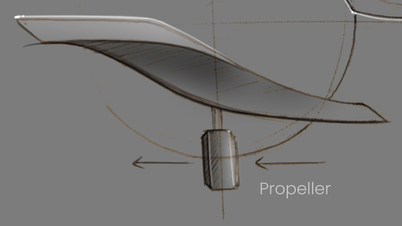
Collecting bowl



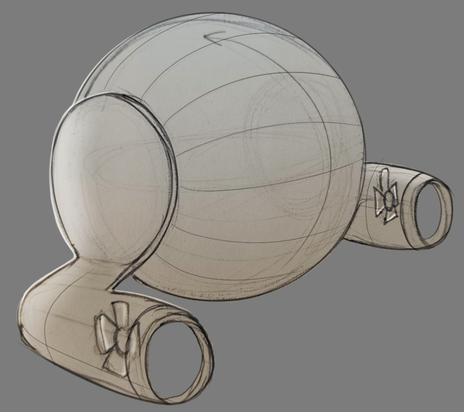


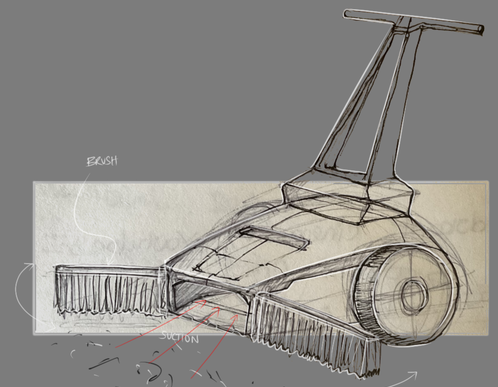
Main body structures

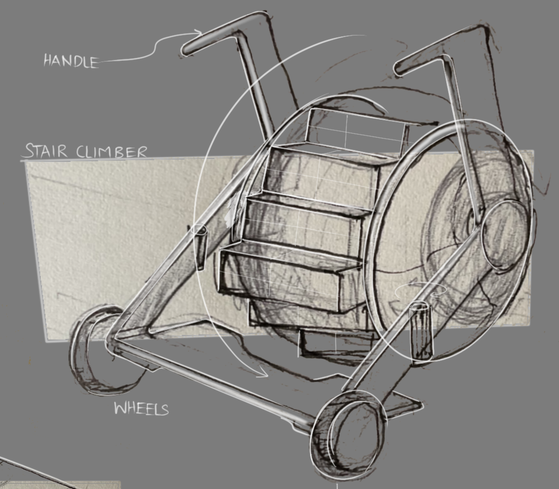


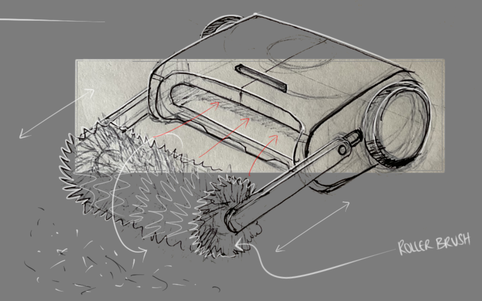


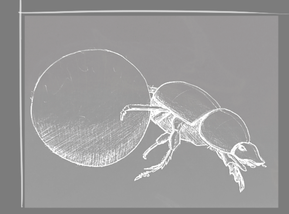
Propeller

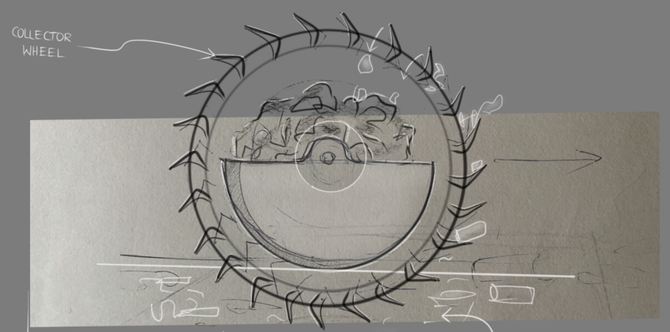


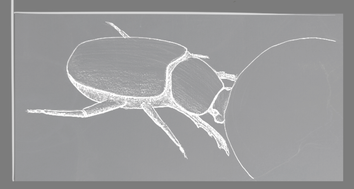


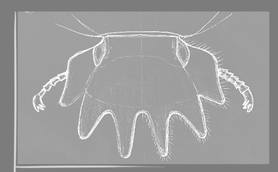


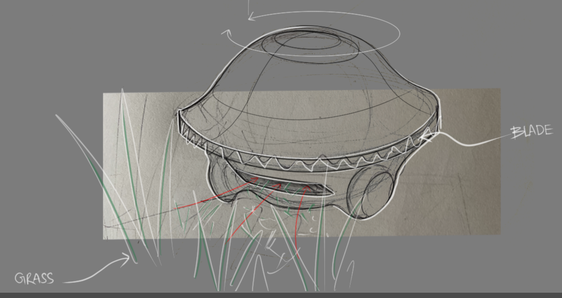


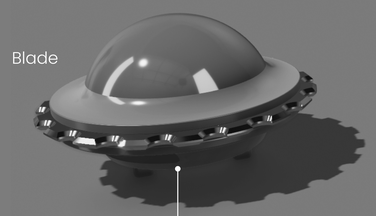




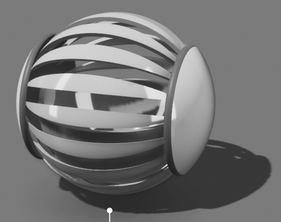




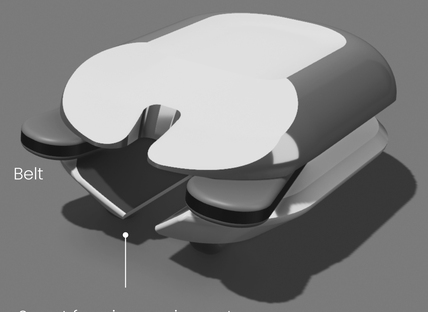




Grass cutter machine

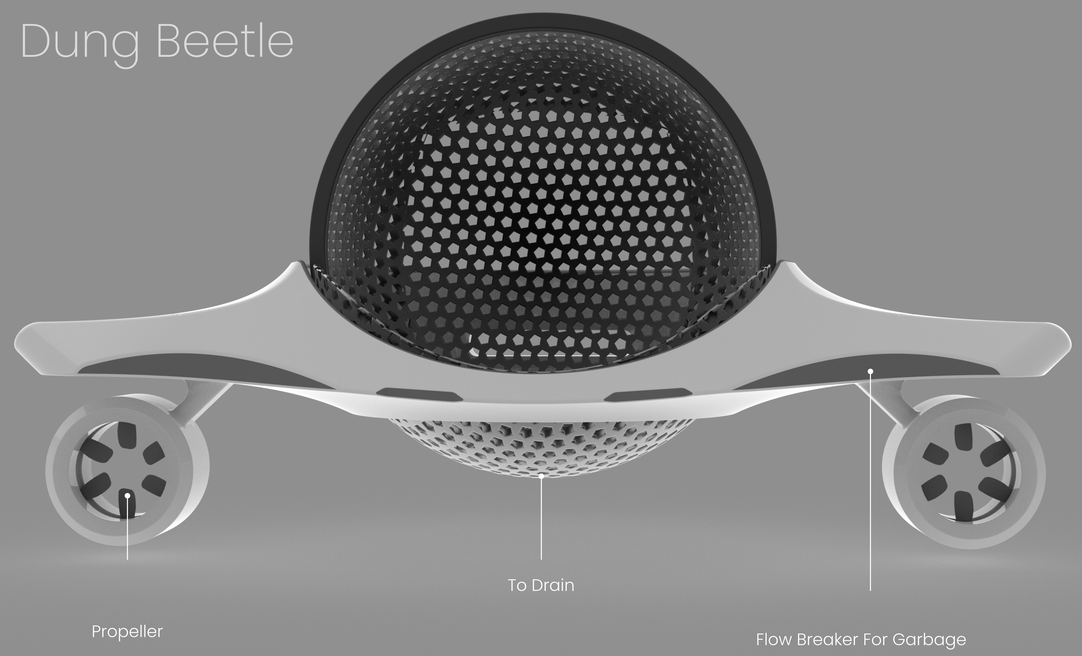
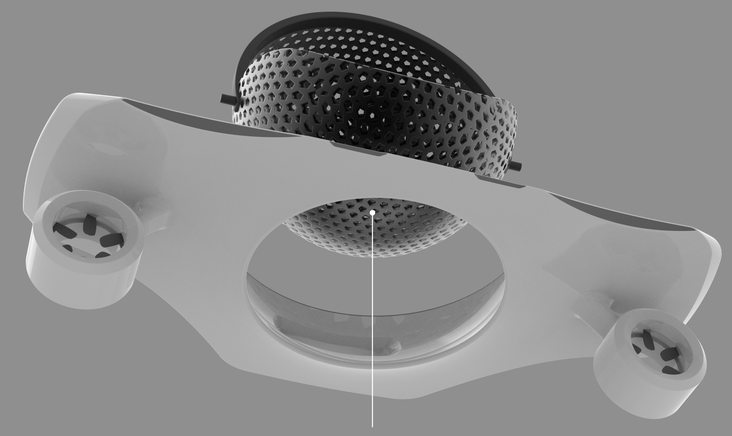
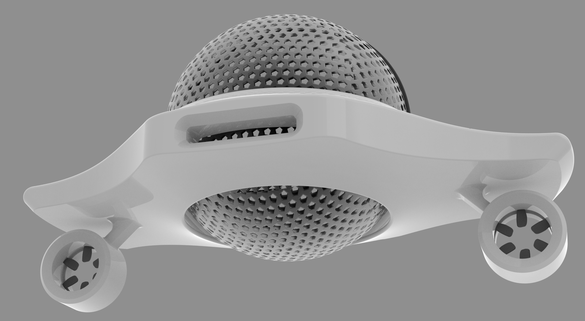
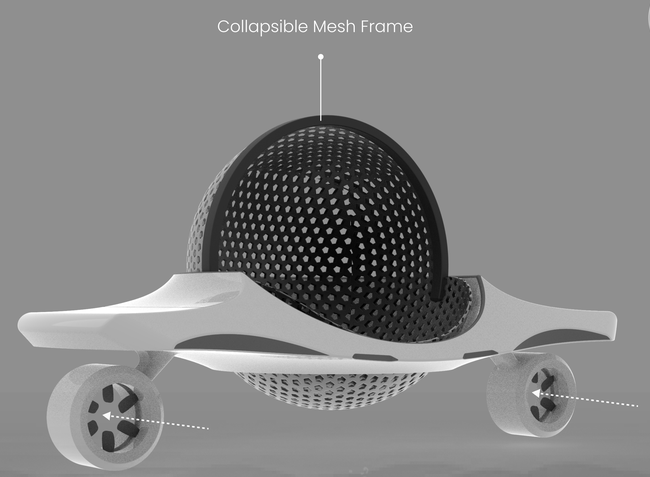
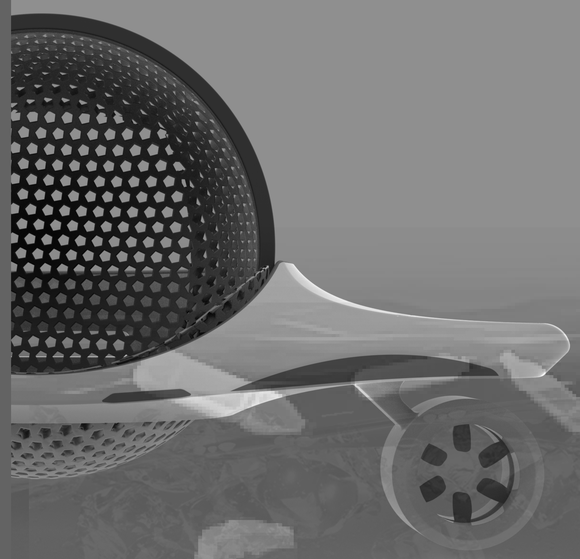
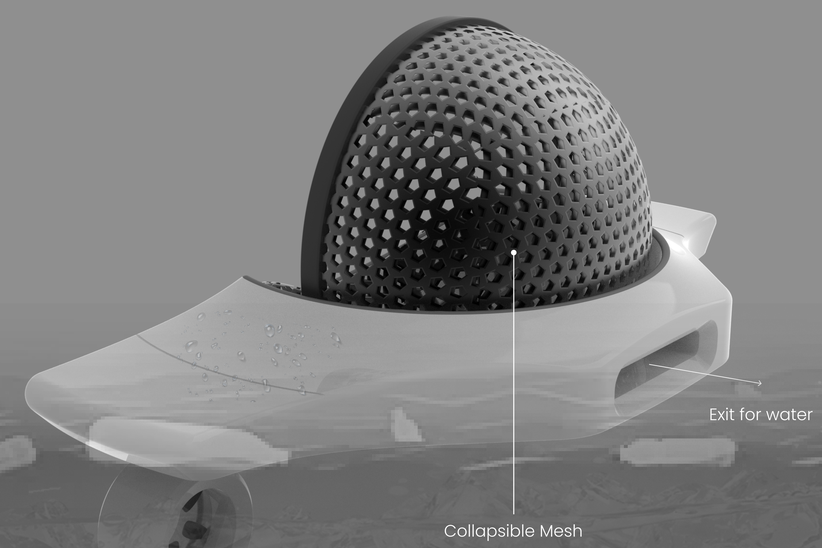


Marine garbage collector



Smart farming equipment

Uppili Nithin Soorya | 216130016

FINAL CONCEPT

Marine Garbage Collector Inspired From Dung Beetle