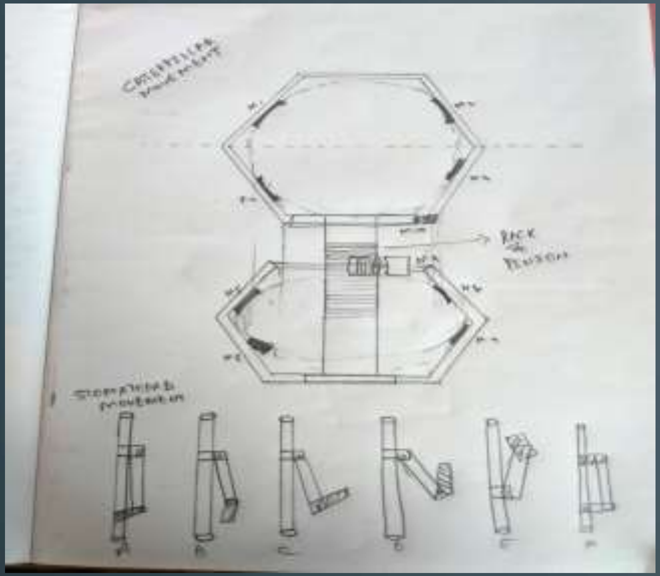
AUTOMATIC COCONUT HARVESTER

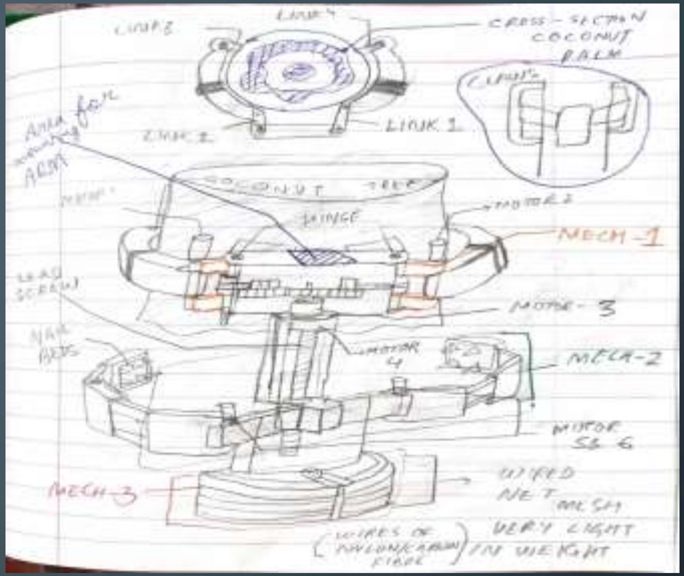
TEAM-3 RUDRA

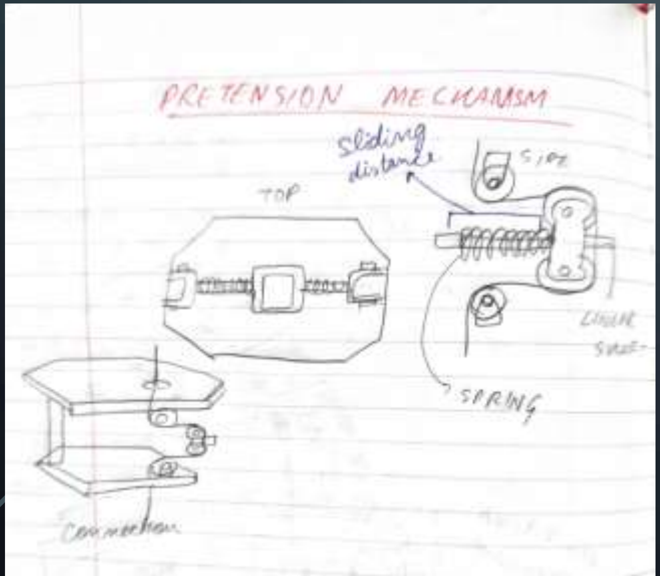
MECHANICAL

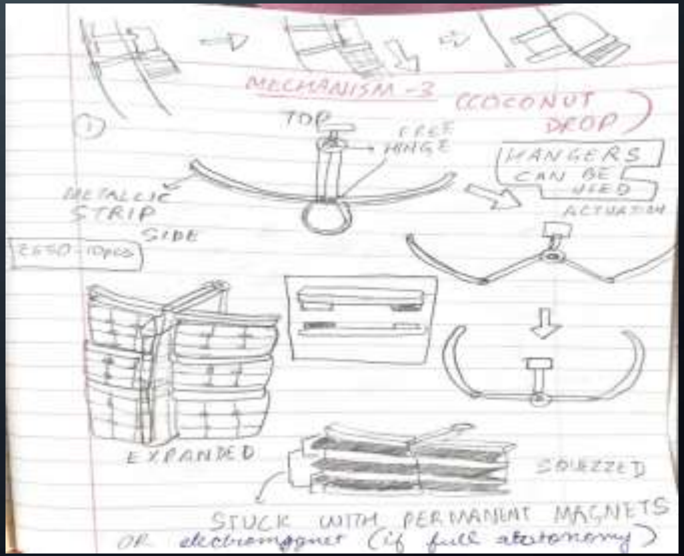
- Rough diagrams
- CAD Model
- Calculations
- Budget and weight
- Simulation

ROUGH DIAGRAMS

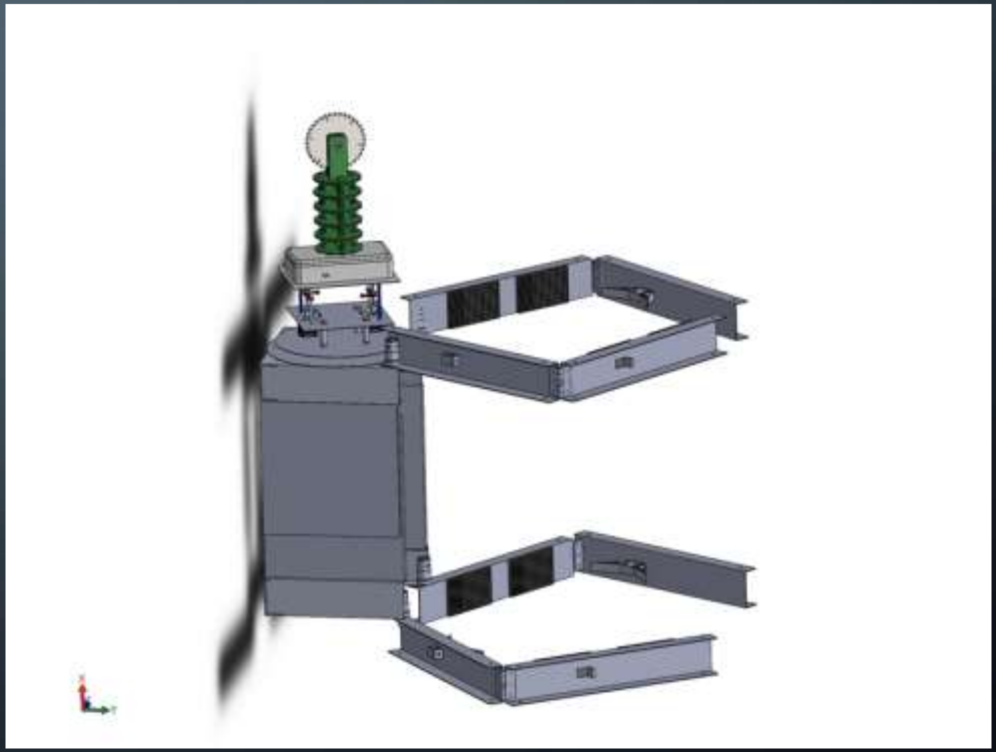




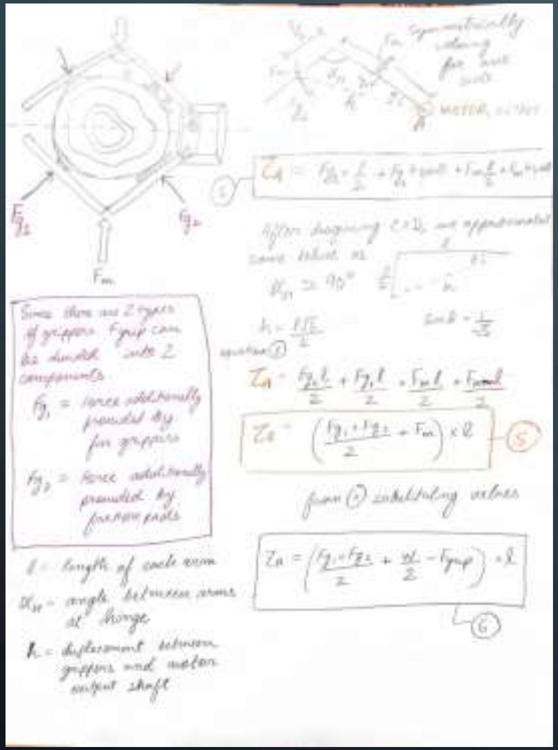


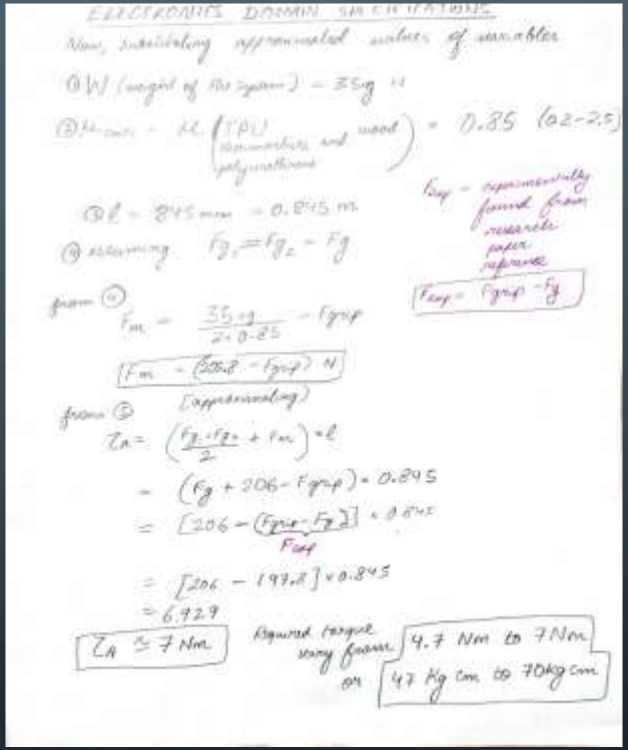


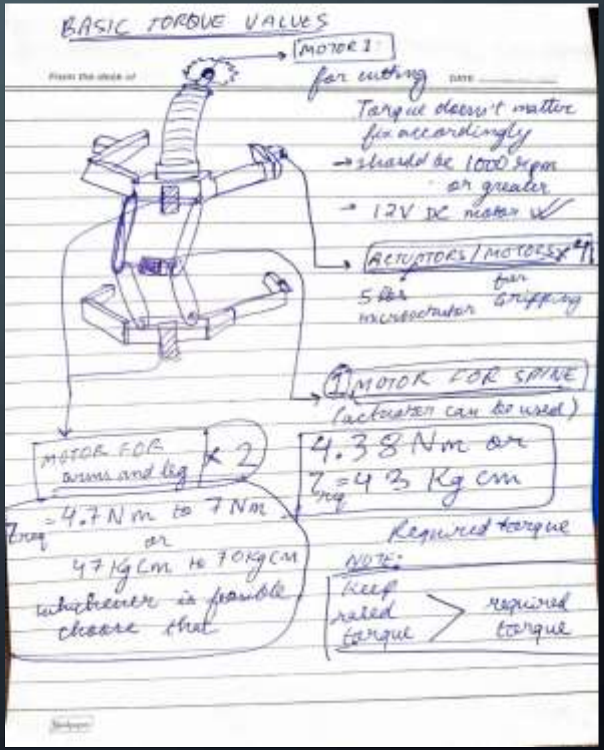
CAD MODEL



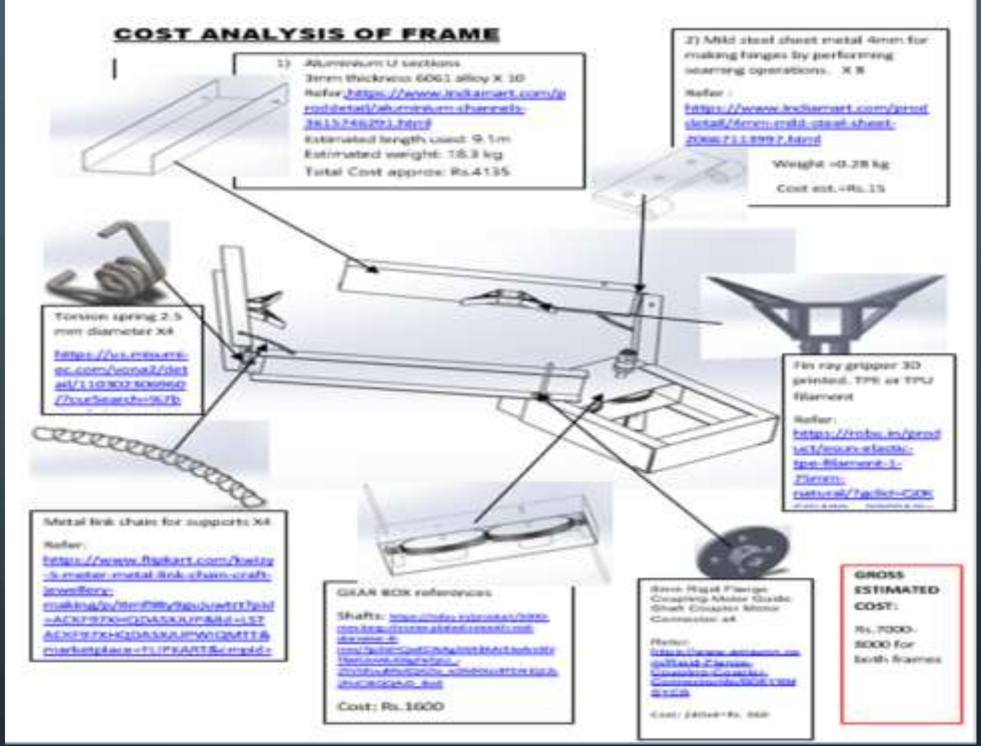
CALCULATIONS







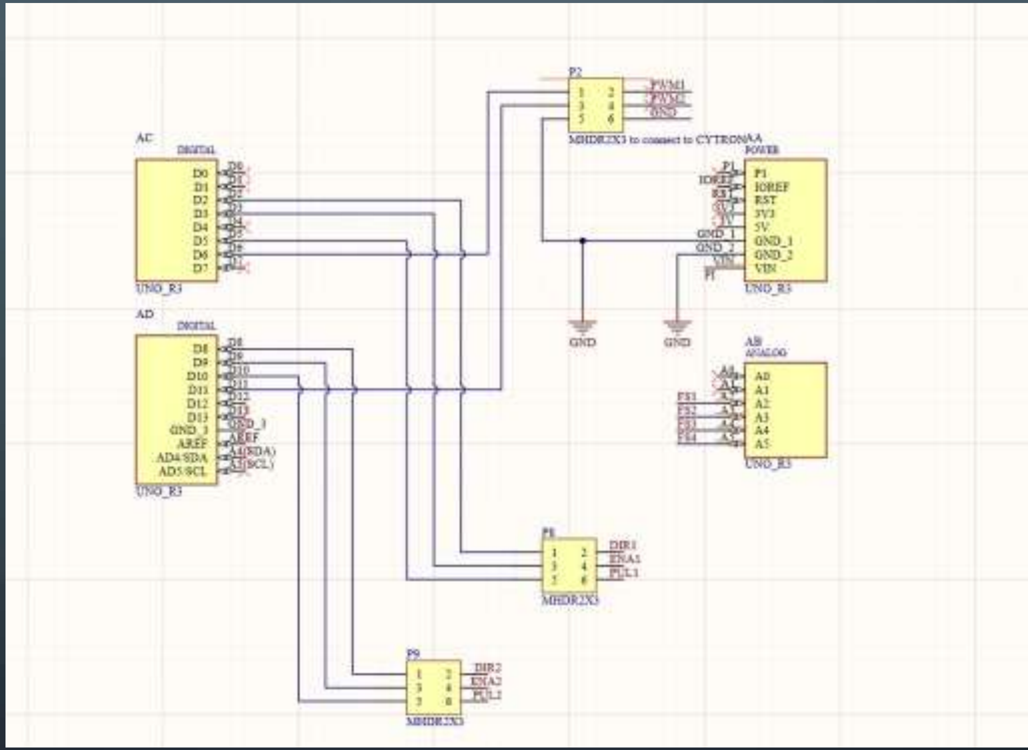
COST OF FRAME



ELECTRONICS

- Schematic for ARM
- Calculations
- Budget
- PCB Design

SCHEMATIC FOR ARM



BATTERY CAPACITY CALCULATION

formula: (current x time)

Current Requirement of different components (for body):

1. NEMA 34(45 kg-cm) stepper motor: 5A/phase x 4 = 20A
2. Linear Actuator: 2Amps max Total current =20+2=22 Amps.

If the current drawn is x amps, the time is T hours then the capacity C in amphours is

$$\boxed{C = xT}$$

Capacity calculation: 22 x 1 Ah = 22Ah (we multiplied with 1 coz we need the system to work for one hour)

Cycle life considerations

It isn’t good to run a battery all the way down to zero during each charge cycle. For example, if you want to use a lead acid battery for many cycles you shouldn’t run it past 80% of its charge, leaving 20% left in the battery. This not only extends the number of cycles you get, but lets the battery degrade by 20% before you start getting less run time than the design calls for

$$\boxed{C' = C/0.8}$$

Final capacity requirement for body = 22/0.8 = 27.5Ah

CURRENT REQUIREMENT OF DIFFERENT COMPONENTS (FOR ARM):

1. NEMA 23(18.5 kg-cm) stepper motor:2.8A/phase x 2 = 5.6A ~ 6A
2. Johnson dc motor: 5A (max) x 2 = 10A Total current =16 Amps.

If the current drawn is x amps, the time is T hours then the capacity C in amphours is

$$C = xT$$

Capacity calculation: 16 x (20/60) Ah = 5.33Ah (we multiplied with 20/60 coz we need the system to work for 20 min)

Cycle life considerations

C’ = C/0.8

Final capacity requirement for arm = 5.33/0.8 = 6.66Ah NEMA 23(18.5 kg-cm) stepper motor:2.8A/phase x 2 = 5.6A ~ 6A

1. Johnson dc motor: 5A (max) x 2 = 10A Total current =16 Amps.

If the current drawn is x amps, the time is T hours then the capacity C in amphours is

$$C = xT$$

Capacity calculation: 16 x (20/60) Ah = 5.33Ah (we multiplied with 20/60 coz we need the system to work for 20 min)

Cycle life considerations

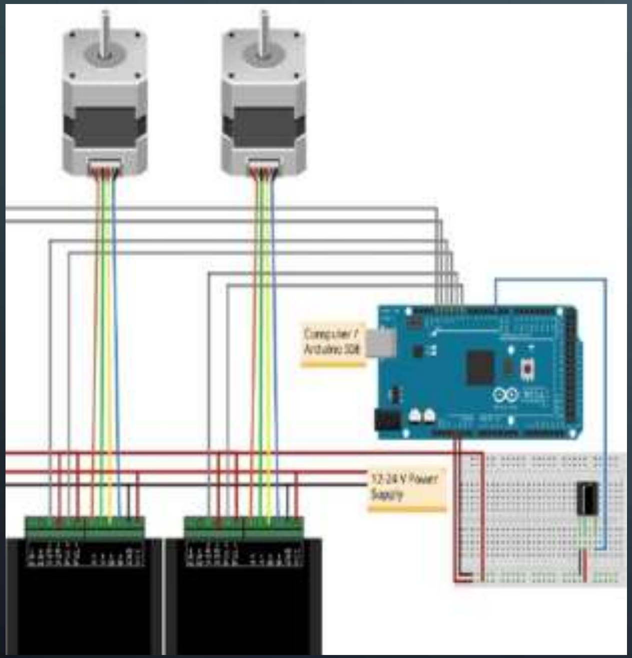
C’ = C/0.8

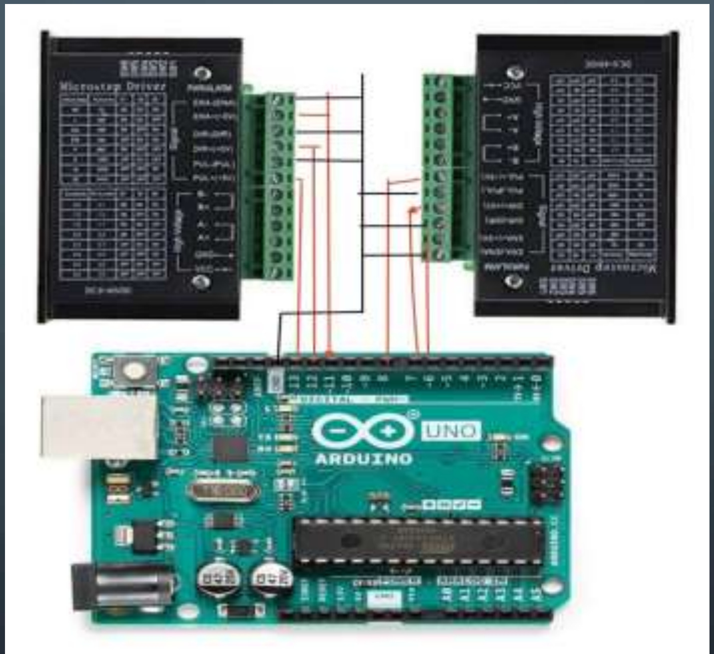
Final capacity requirement for arm = 5.33/0.8 = 6.66Ah

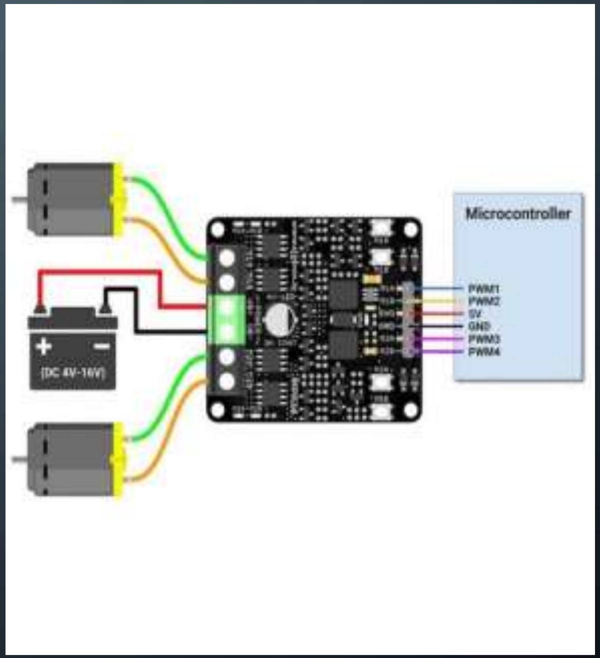
BUDGET

S.no	Component	Price	qnt	Total price
1	nema 34(45kcm stepper motor)	4490	4	17960
2	motor driver for nema 34	2600	4	10400
3	nema 23(18.5kg cm stepper motor	1650	2	3300
4	Nema 23(motor driver)	550	2	1100
5	Linear actuator	3300	1	3300
6	DC motor driver 3A	520	1	520
7	Johnson motor	325	2	650
8	Dual channel 20A DC motor driver	1200	1	1200
9	Battery(10000mah)	2400	3	7200
10	Battery(6600mah)	1500	1	1500
11	Raspberry Pi 5MP Camera Module with Cable	290	1	290
12	Raspberry Pi	2675	1	2675
13	Arduino uno	350	1	350
	Total			50445(excl gst)

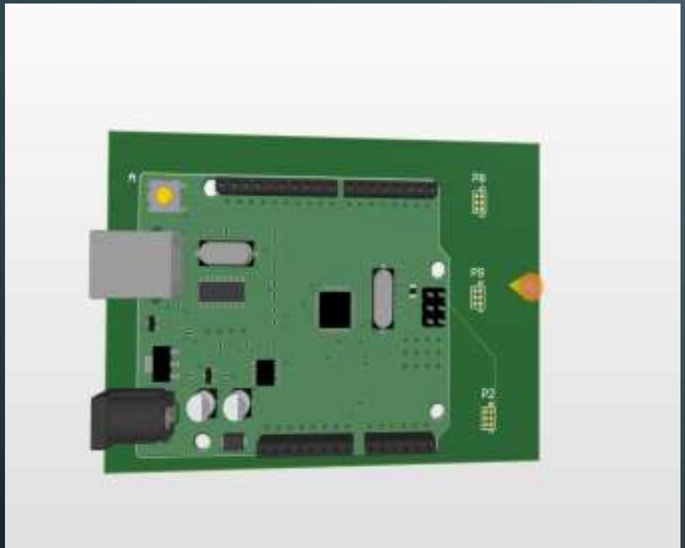
PICTORIAL REPRESENTATION

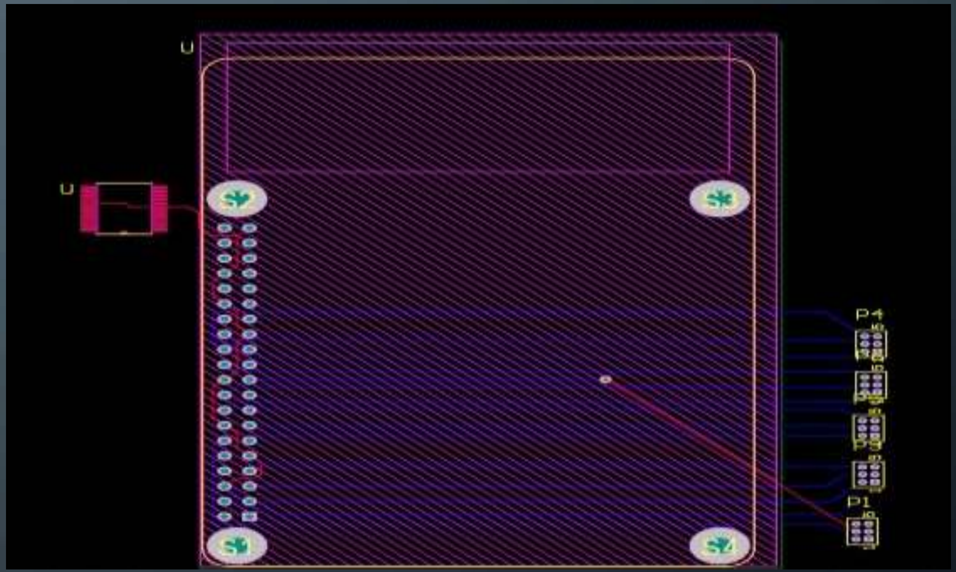




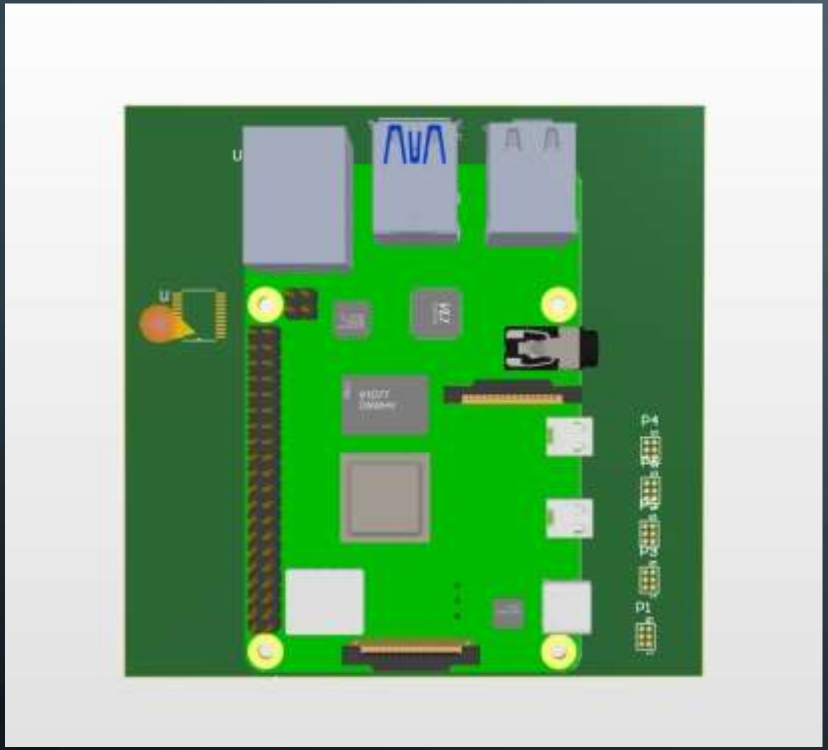


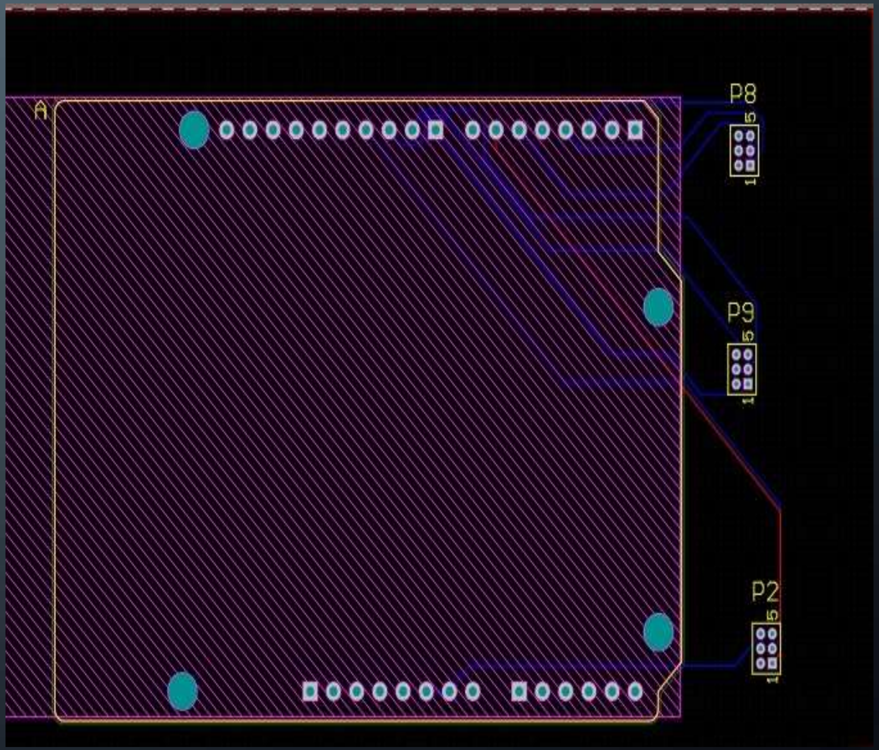
PCB DESIGN/SCHEMATIC





BODY DESIGN

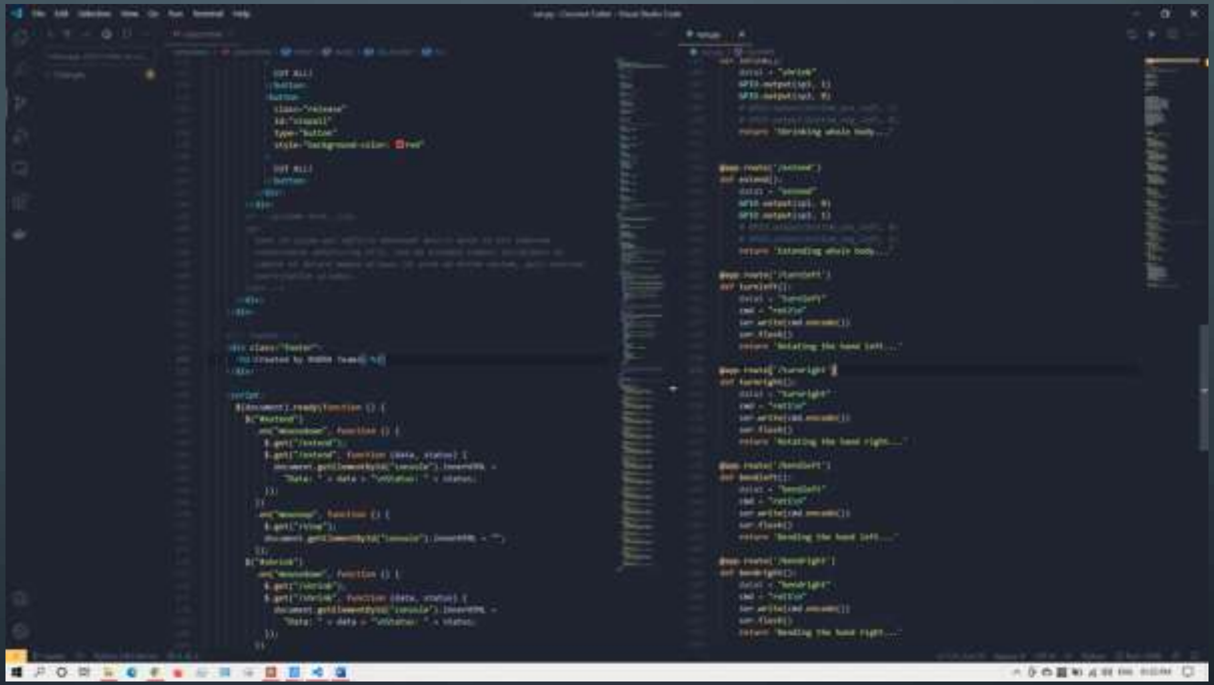




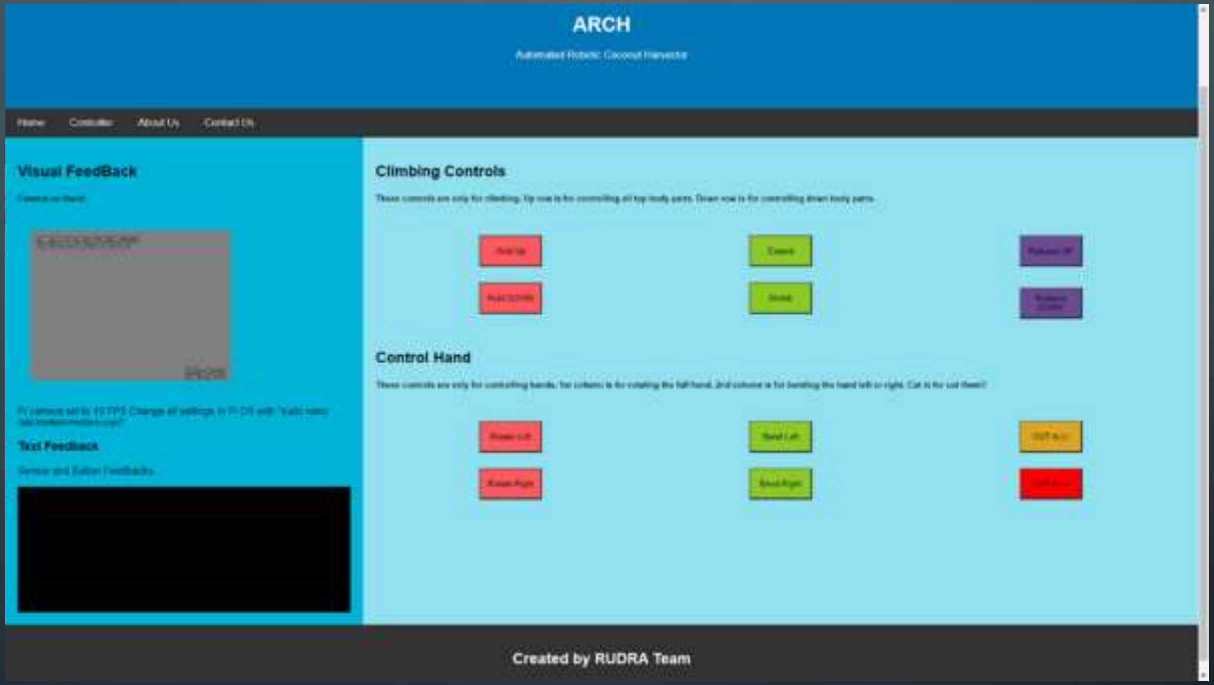
CODING

- CODE
- INTERFACE
- PACKAGES USED

CODE



INTERFACE


ARCH
Automated Robotic Coconut Harvester
Home
Controller
About Us
Contact Us
Visual FeedBack
Climbing Controls
Control Hand
Text Feedback
Created by RUDRA Team

PACKAGES USED

- 1) Flask
- 2) GPIO
- 3) Serial
- 4) Jquery

BUSINESS PLAN

India is one amongst the highest producer and also consumer of coconut in the world market and yet this comes with a bit of risk and to counter that our product the Automatic Coconut Harvester will play a key role

- Our Idea is to make coconut harvesting much more fun and easy by providing farmers the access to our product through a scheme.
- Scheme- Under our scheme farmers can rent our machine to harvest coconuts in a safe and better way