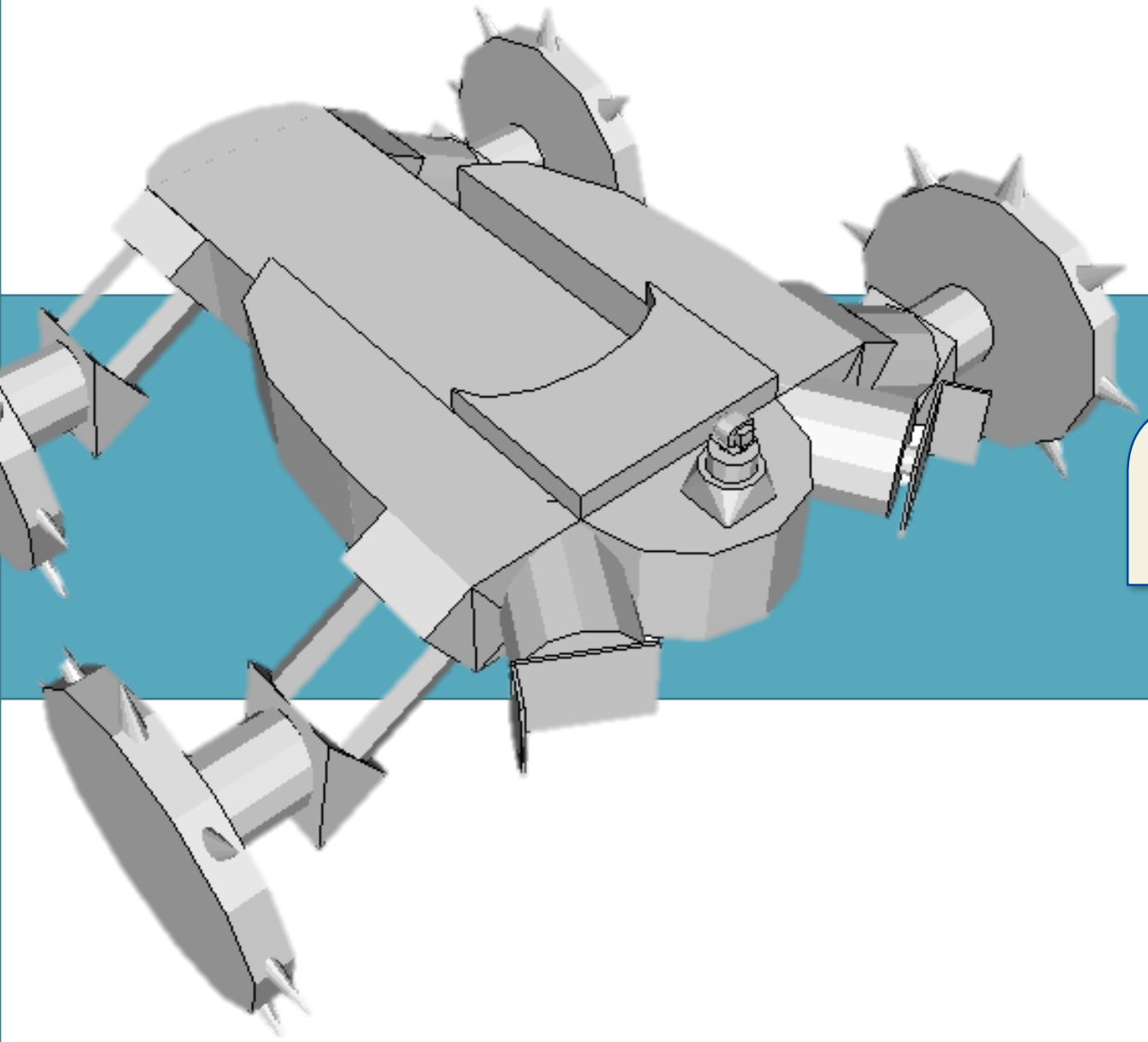


Savitribai Phule Pune University, Pune

NASHIK DISTRICT MARATHA VIDYA PRASARAK SAMAJ'S KARMAVEER ADV.BABURAO GANPATRAO THAKARE COLLEGE OF ENGINEERING

KBTCOE

NAAC

Agro Bot

Guide : **Ms. S. A. DHUMANE**

Presented By

Pranoti Kasture **Exam No: 71926911D**

Rushikesh Sukase **Exam No: 71816706G**

Siddhant Joshi **Exam No: 71816522F**

Our Team Style

Pranoti Kasture

Designer

71926911D

Siddhant Joshi

Designer

71816522F

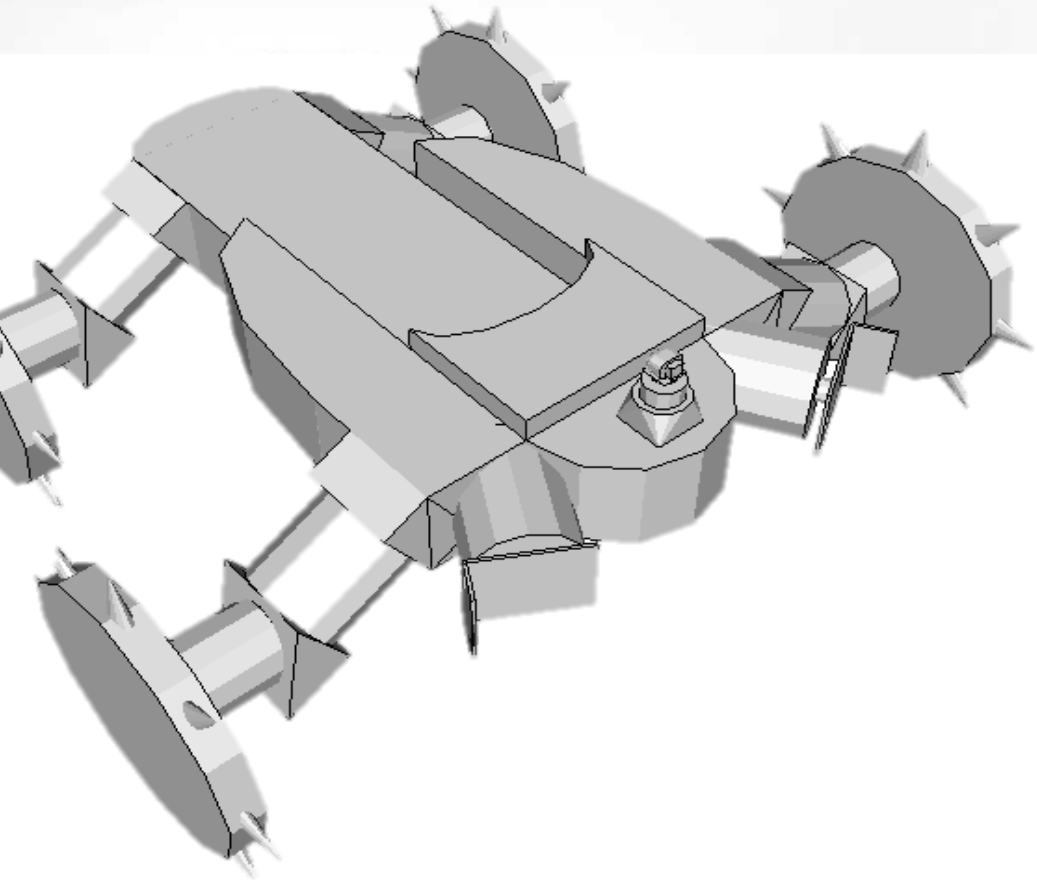
Rushikesh Sukase

Programmer

71816706G

Flow Of Presentation

Agro Bot



01 Introduction
Problem Statement, Finding of feasible solution.

02 Solution
Explanation of solution proposed.

03 Analysis and Design
Design system, Implantation of solution.

04 Software implementation
Writing source code

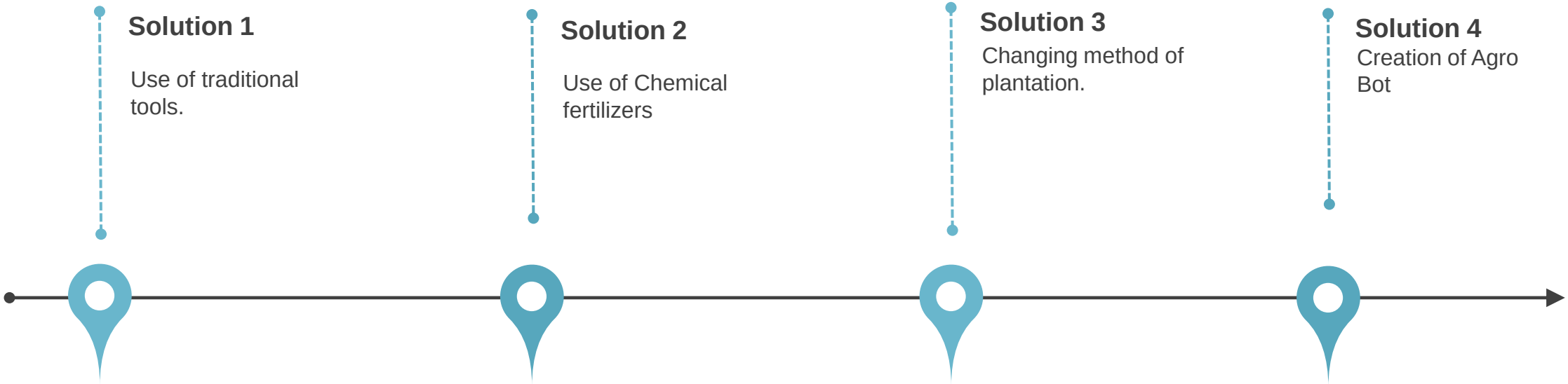
05 Result and Conclusion
Conclusion.

Introduction

Problem Statement :

Weeds grown between two row of crops absorbs all Essential nutrients needed for the main crop.

Finding of feasible solution



Literature survey

A weed is a plant considered undesirable in a particular situation, "a plant in the wrong place". Examples commonly are plants unwanted in human-controlled settings, such as farm fields, gardens, lawns, and parks. Lots of amount of money is spent to remove this grass and weed by farmers.

The removal of weed is a manual work. Kurpi, hoe, grass cutter are some of the weed cutting tools. Our aim is to make this task a little easy and cost efficient. The solution from our team is **“AGRO-BOT”.**

Mathematical model

3 to 4 labors for 800 each 4 * 800 = 3200 Rupees for one time

Three times for 6 months 6 * 3200 = 19200Rupees

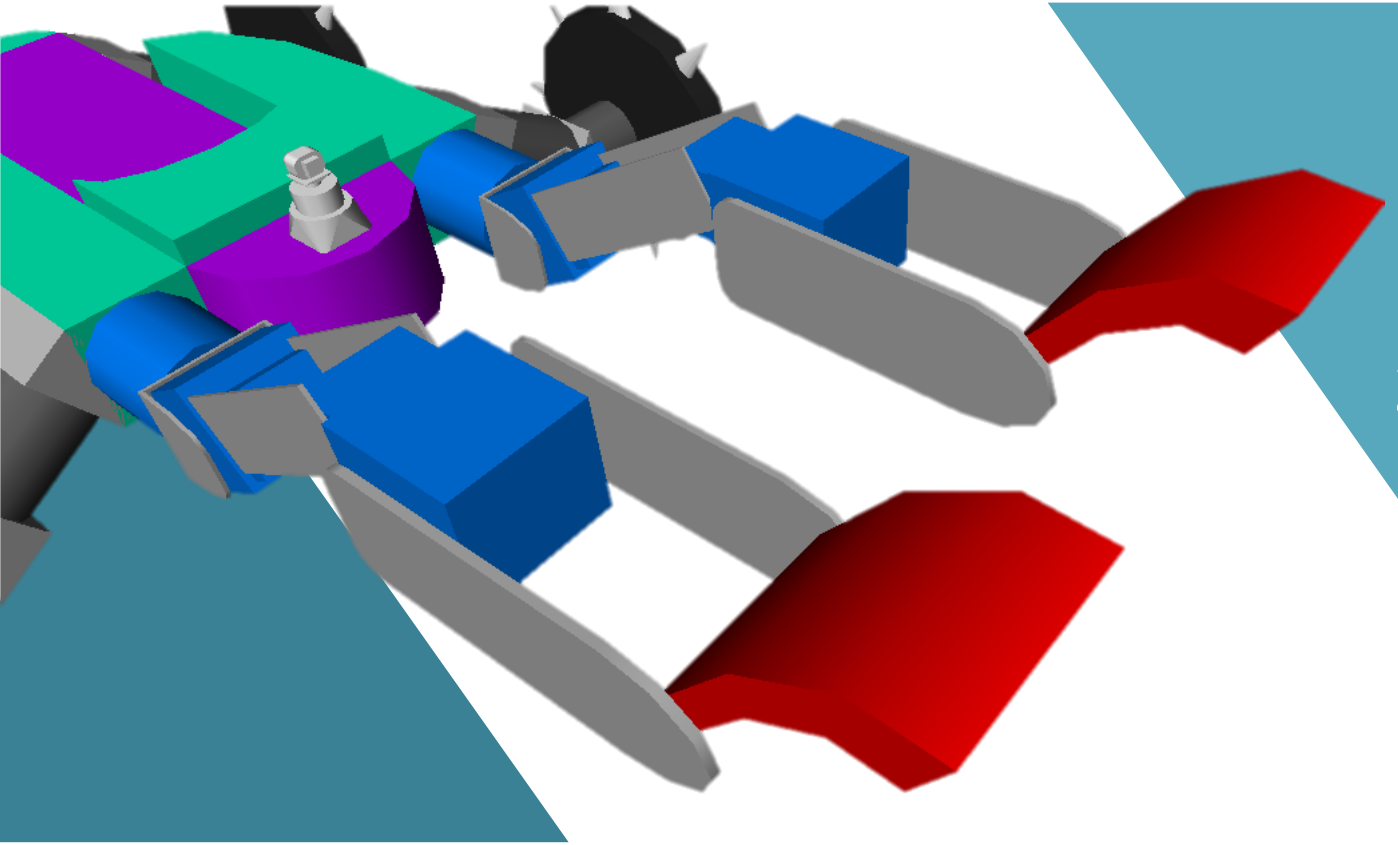
As one crop is cultivated for around 5 years on an average * 19200 = 96000Rupees

Approximately 96000 INR which is nearly 1 lakh rupees is spent by the farmer on weed management.

Our aim is to reduce the cost and increase the profit for farmers, and to reduce the expenditure on weed harvesting using controller based weed management robot.

Agro-Bot

We build future …



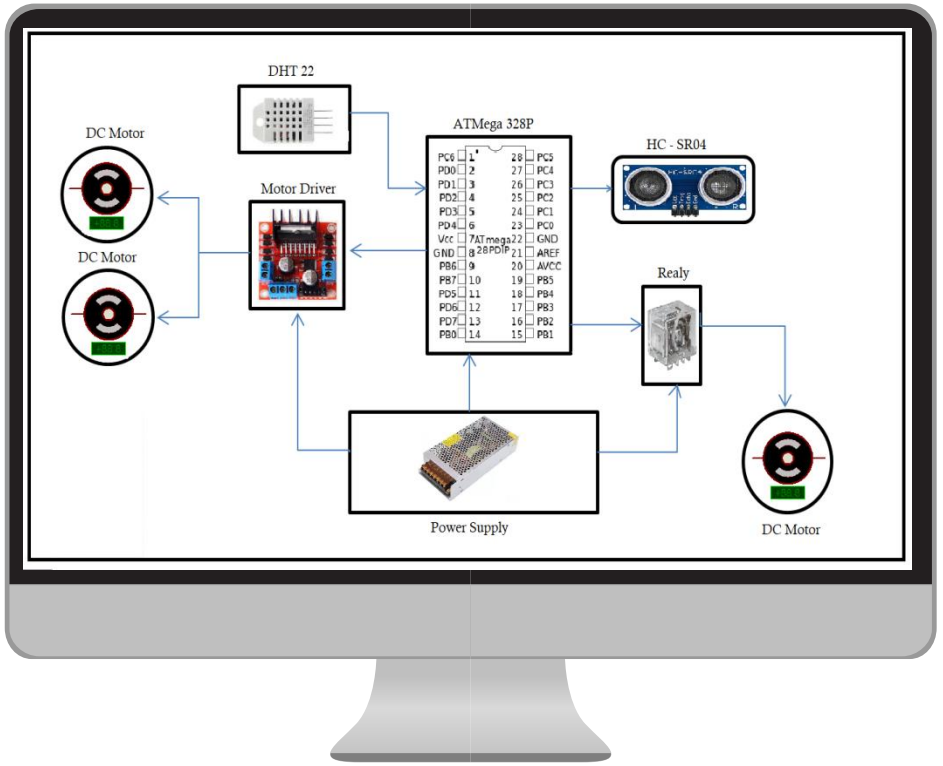
1.Why ?

It important to get rid of weeds because weeds such as nut grass actually reduce crop yields on farms because their roots release chemicals that are harmful to surrounding plants. So the impulse of our project is to give the solution to the farmers which will reduce their efforts and they can afford it financially also.

2.How ?

By reusing the waste material we have made heavy metallic frame structure which help to sustain the bot in any hard situation.
Used microcontroller as controlling unit of the bot ,which is interact with other part of the bot like the wheel, arms, and the ejection mechanism.

Block Diagram



Power Supply

The Power supply is of 1 Amp and 12 Volts with a distortion less then that of 10% ripple.

AT Mega – 328P Controller

We have used the AT Mega 328p as our controlling unit which has 8 bit RISC architecture

HC SR04

HC SR04 is ultrasonic sensor it has two transducer to receive and transmit the data with range of 2cm to 400cm

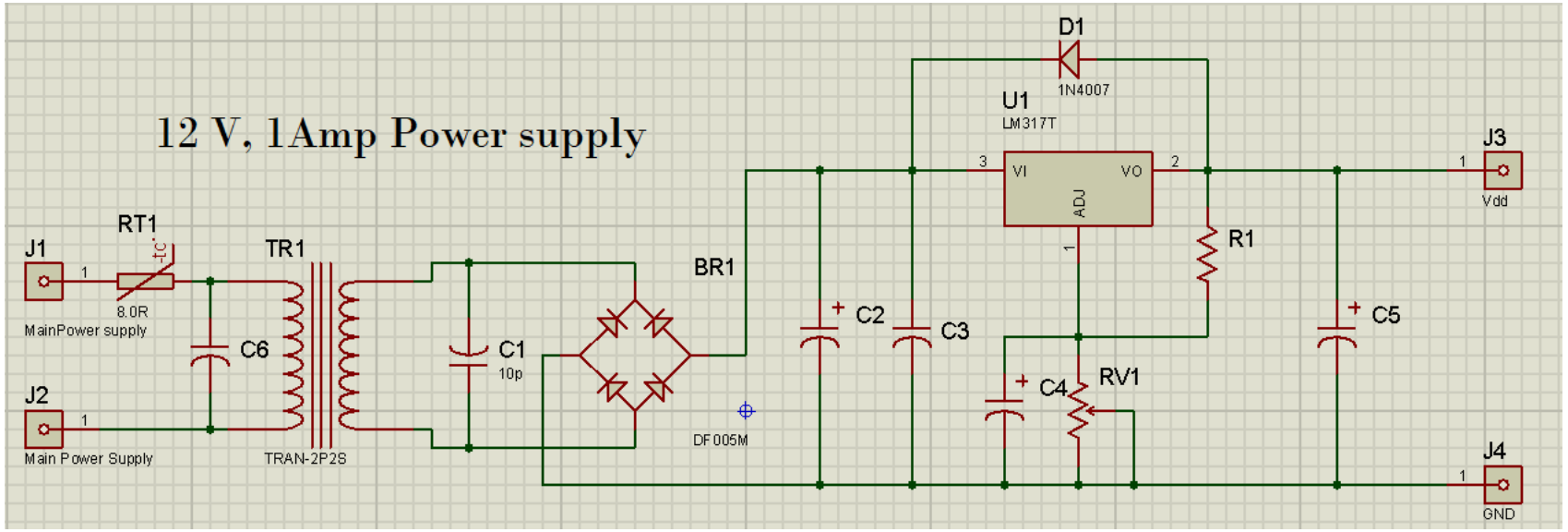
L298N Driver

L298N Motor Driver has H Bridge module in order to control the movement of the bot it handed up to 3 Amp of current and 36 Volts

Relay

Relay is connected to the ejection mechanism to operate it.

Block Diagram



Selection of transformer

$$V_{peak} = V_{rms} * 1.414$$

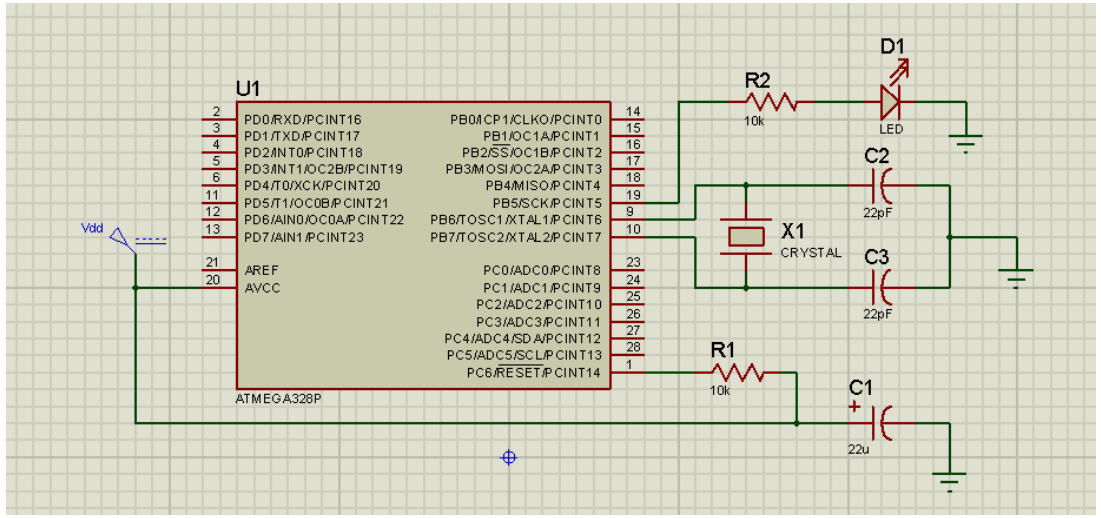
Selection of smoothening capacitor

$$C = \frac{5\ I_o}{V_p\ f}$$

Section of voltage regulator

$$V_{out} = 1.25\left(1 + \frac{R_1}{R_2}\right) + I_{adj} * R_2$$

Block Diagram

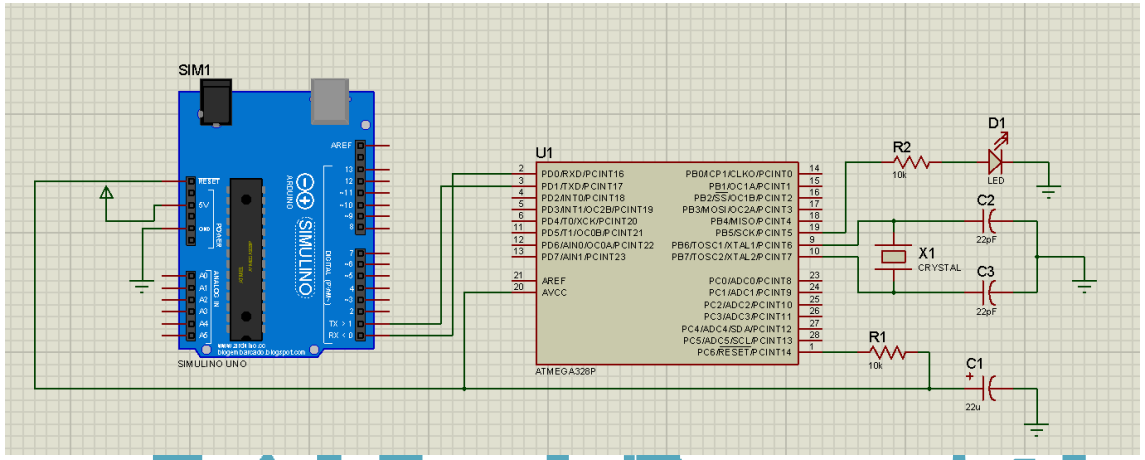


Basic Configuration

- A 16MHz crystal.
- A 10K resistor.
- Two 22pf capacitors
- A 10uf capacitor

Burning program on controller

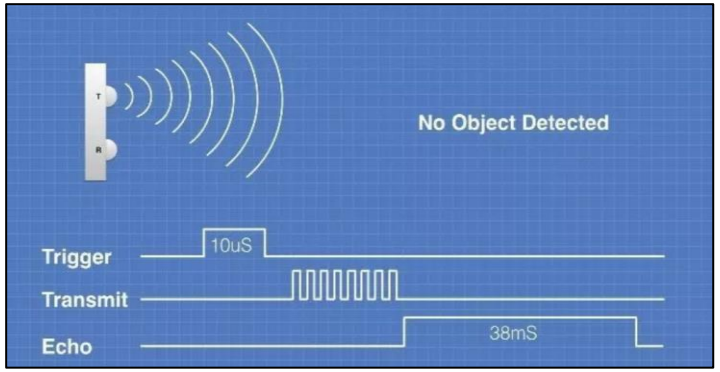
Using serial communication ports of the board which are connected to the serial communication pin out of the controller.



Block Diagram

HC SR o4

HC-SR04 Ultrasonic Distance sensor consist of two transducers one as a receiver and other as transmitter its range is from 2 cm to 400 cm.

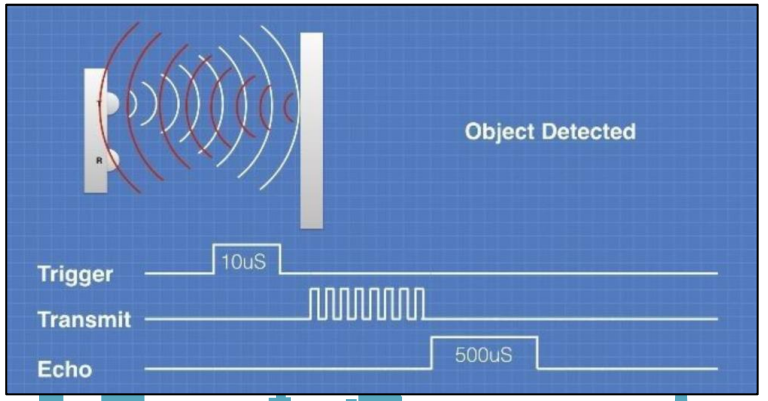


No Object

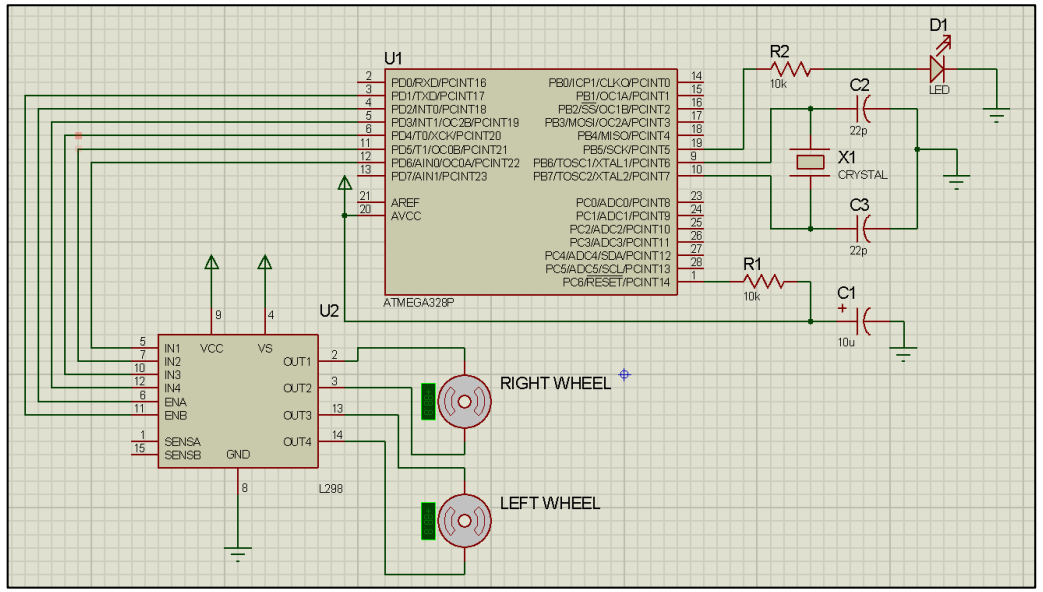
If the echo is more then there is no object detected

Object detected

If we get a signal of less time duration the any object is present

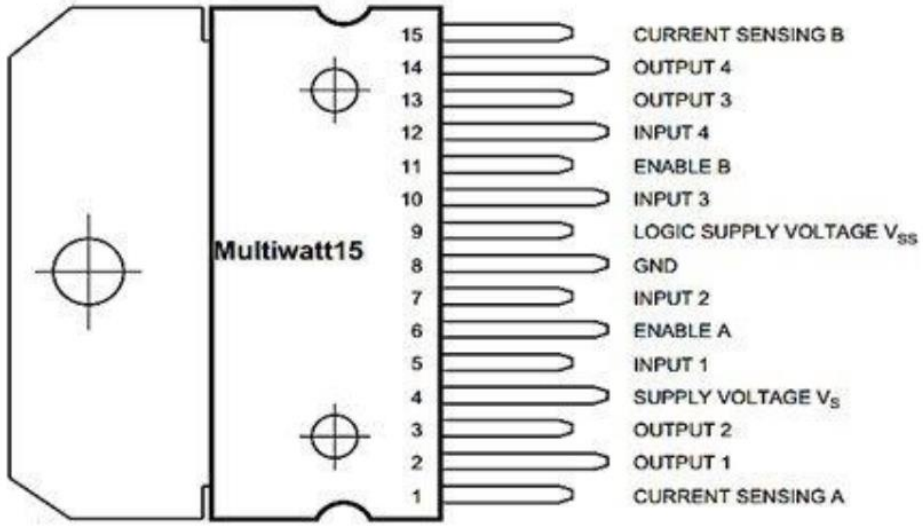


Block Diagram



L298H Motor Driver

bot it handed up to 3 Amp of current and 36 Volts



Specification

INPUT – Input for Motor
OUTPUT – Output for Motor
ENABLE – Enable line for Motor
$\mathbf{V_{ss}}$ – Logic voltage(**5**V)
$\mathbf{V_s}$ – Input voltage for Motor

Circuit Design

Agro Bot

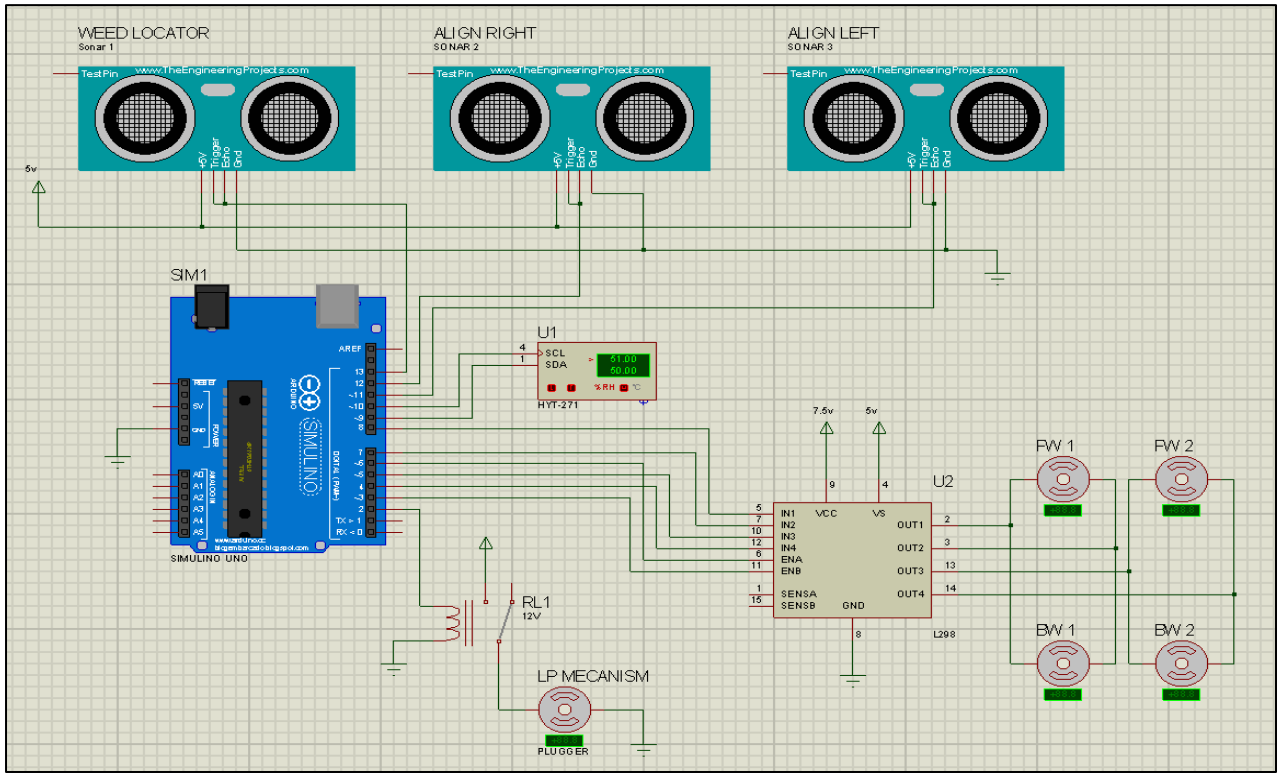
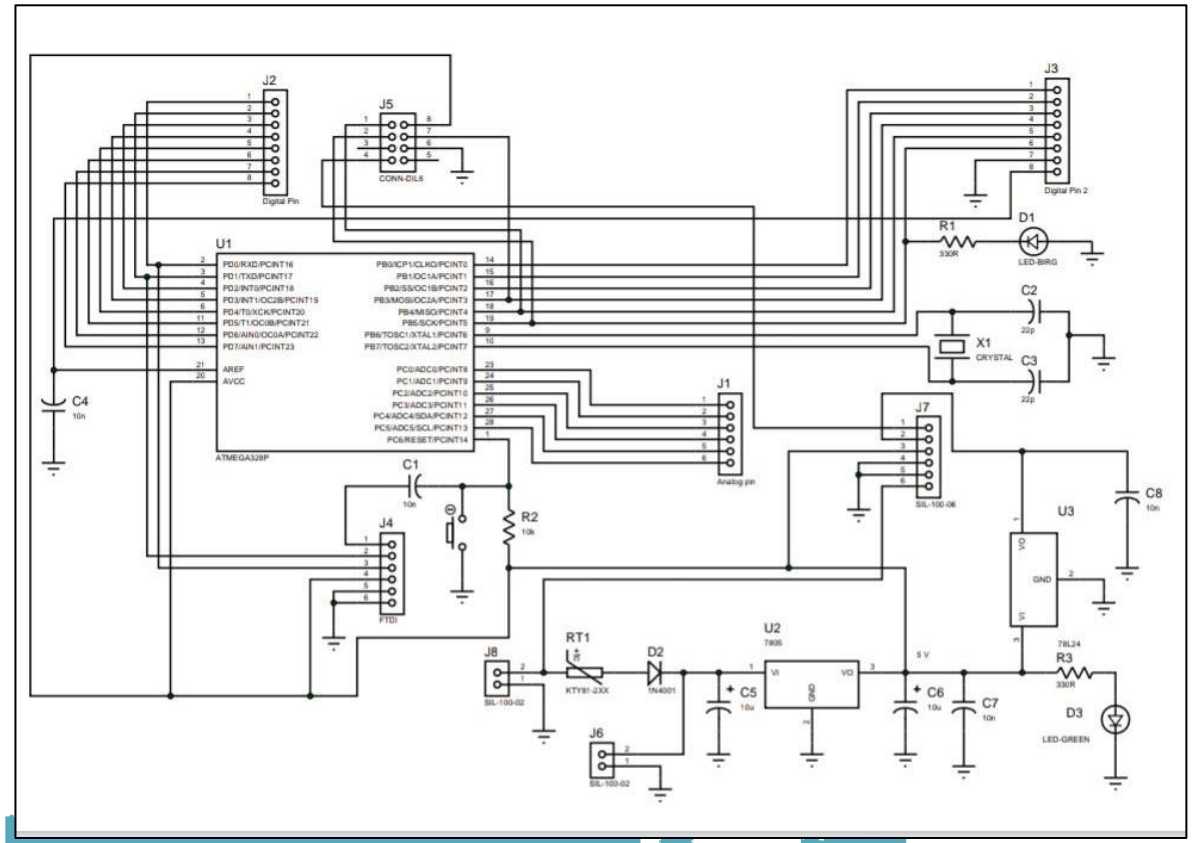


Figure shown below is the circuit diagram of the system which is being proposed by. Where three ultrasonic sensors are place two to aligned the bot in center and one for removal of the weed, with a relay attach to it. A motor driver IC is used in order to control the movement of bot, And temperature and humidity sensor is connect in order to get high accuracy for calculation.

The below circuit diagram shown gives us internal connection of Arduino board used in the solution we proposed,



PCB Design

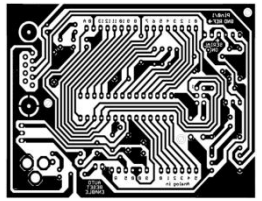
PCB Design

PCB Layout is designed in Proteus and Eagle, below layout is of the Arduino board used in the project.

Copper Plated epoxy sheet
Copper plated epoxy sheet is bought form market

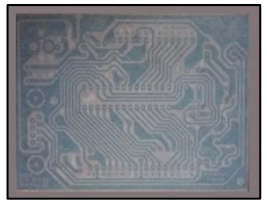
Scrubbing sheet

So that printing of PCB on it will be easy



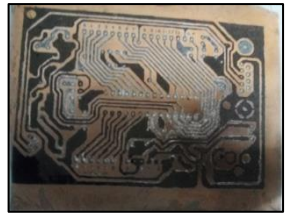
Xerox of PCB

Xerox of Design made in protious



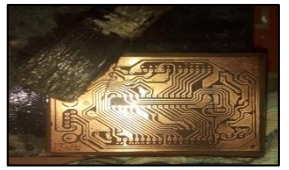
Printing PCB design

Printing of design on the epoxy material



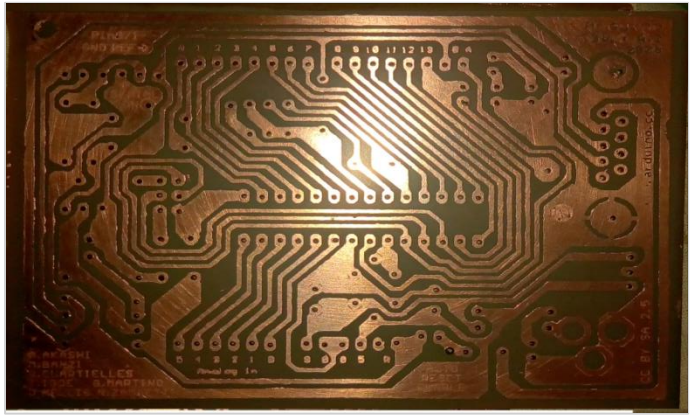
Removal of paper

Removal of paper using water and brush



Removal of Ink
Removal of Ink using alcohol

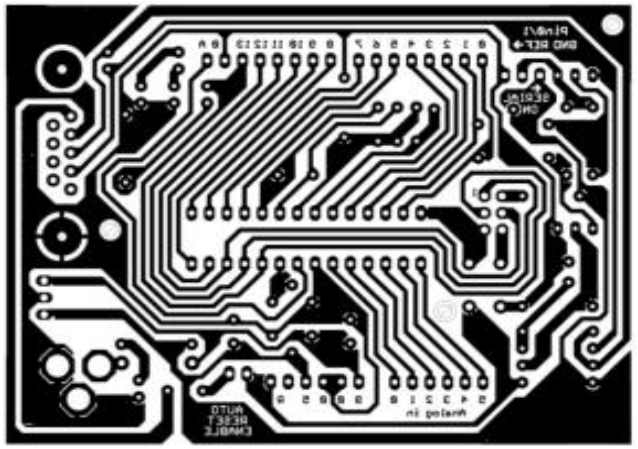
Final PCB



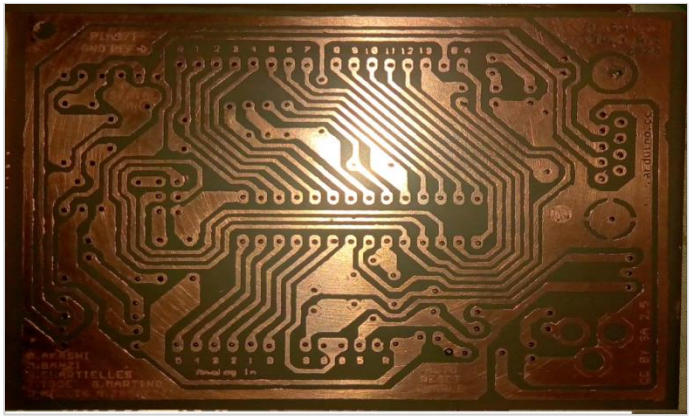
PCB Layout

Agro Bot

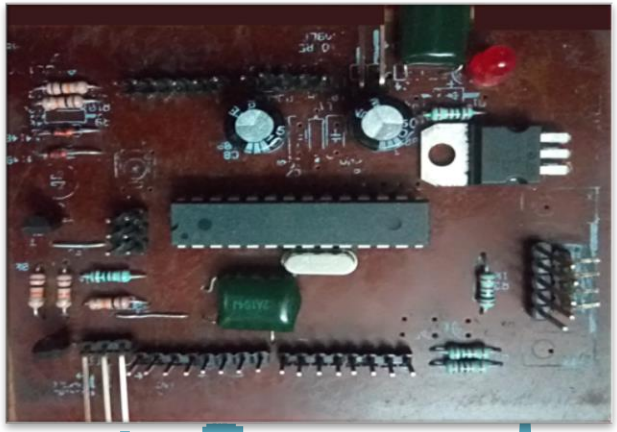
PCB Xerox



Actual PCB

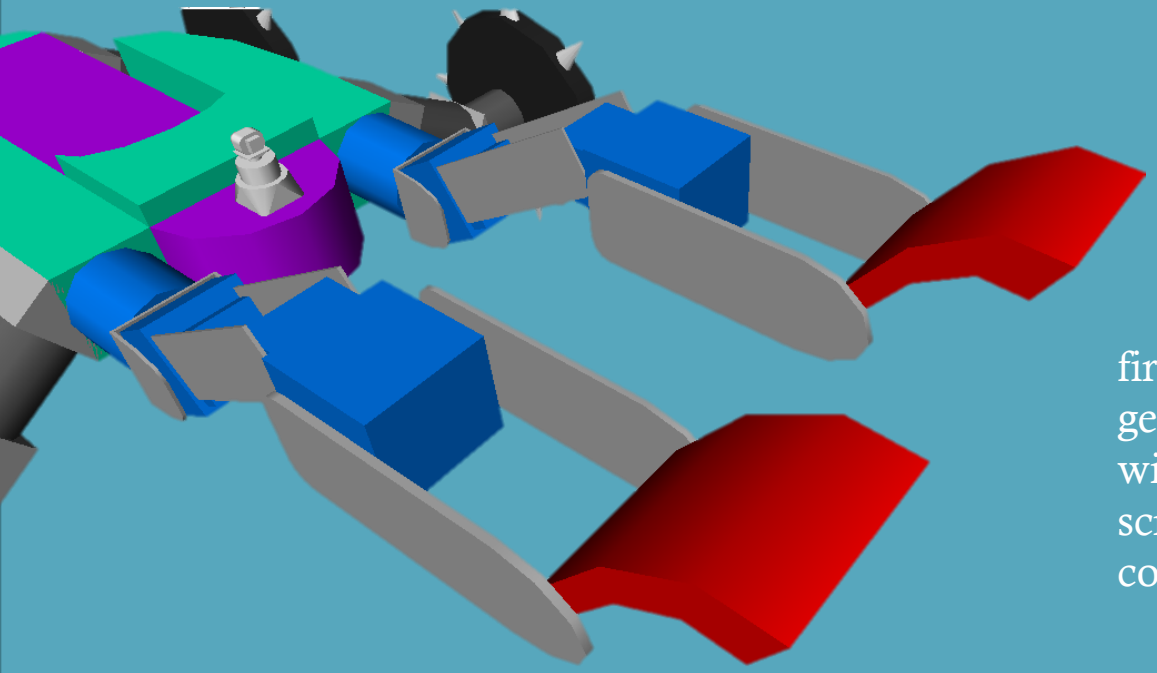


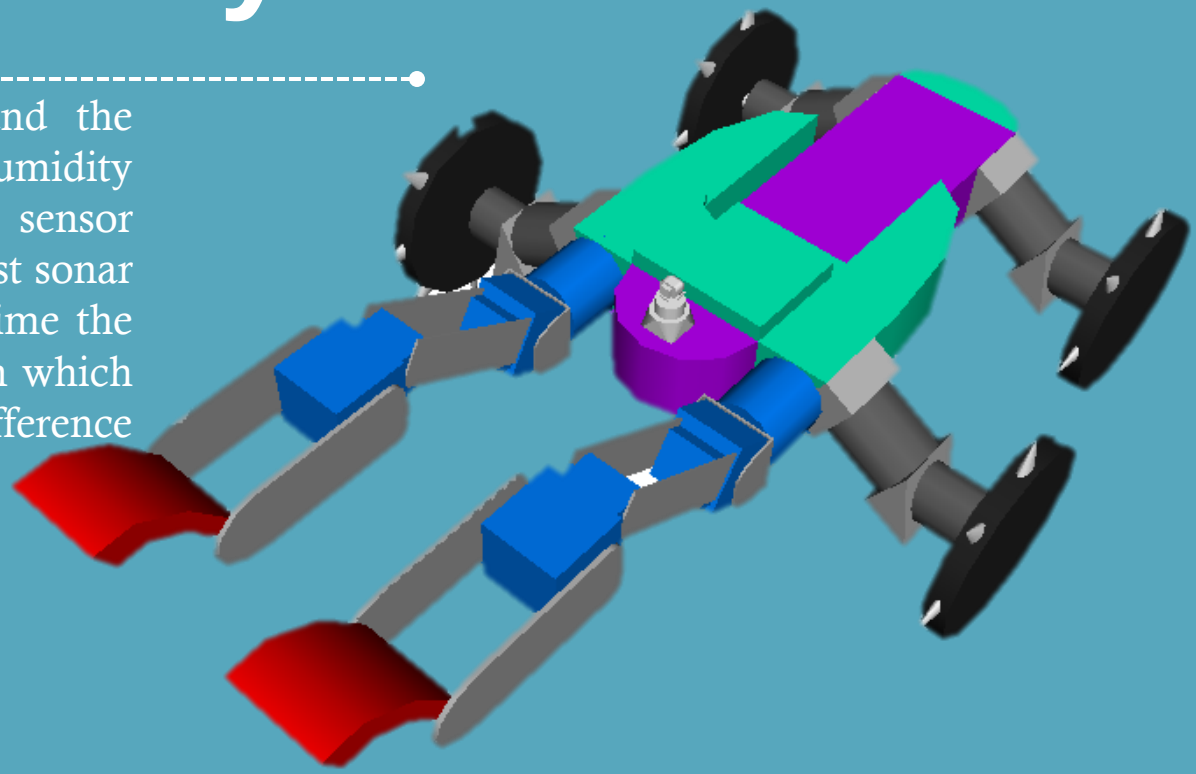
After mounting components



3 D – Visualization of System

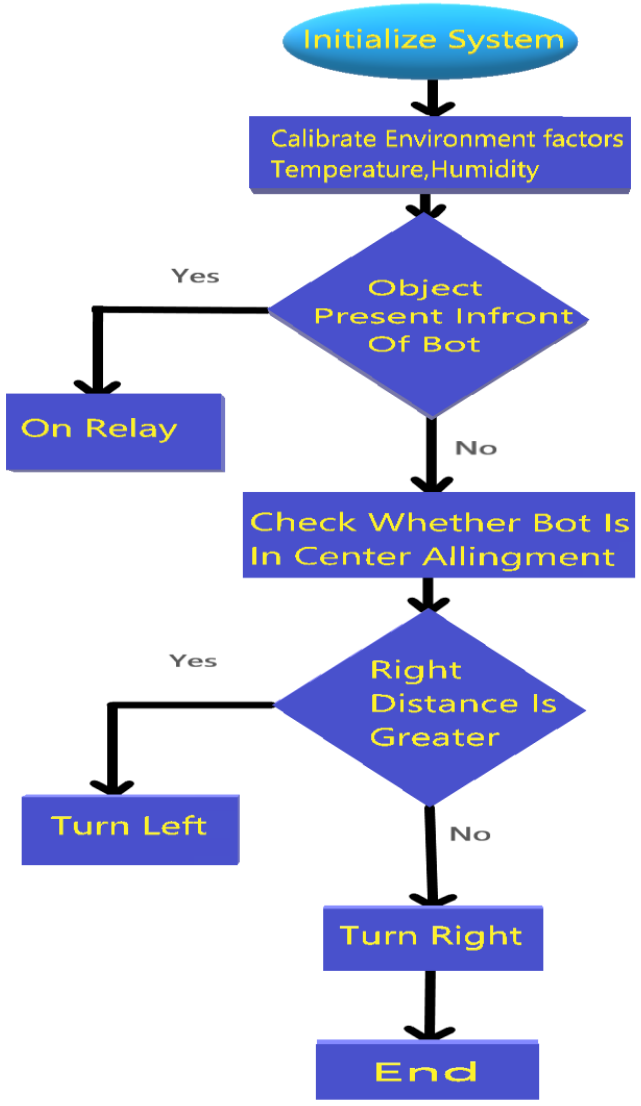
The bot continuously monitors the temperature and the humidity in air using the DHT 22/ DHT 11 temperature and humidity sensor and changes the calculation according to it ,Three sonar sensor present are use to calculate the distance between two object's , the first sonar will fire up sound waves and get the response back , at the same time the second sonar also fire and get the response back from the surface on which the sound waves are rebounded back, the bot calculate the difference between the both responses and act accordingly





As the bot is moving In forward direction at same time it fires up its third sonar which is the weed detection process , if the response get by the sonar states that any obstacle is present in front of he Bot then it will try to remove the obstacle using the LP Mechanism which consist of a screw and a bolt attach to a motor ,as the obstacle is detected the controller commands and the motor is ON start

Software Implementation



1 Step 1

Store temperature value and air humidity and store it in some variables

2 Step 2

Check distance of object if any present in front

3 Step 3

Adjust the distance of the system from the front object

4 Step 4

Check the Right and Left distance of the system and adjust bot as per the data analysis.

5 Step 5

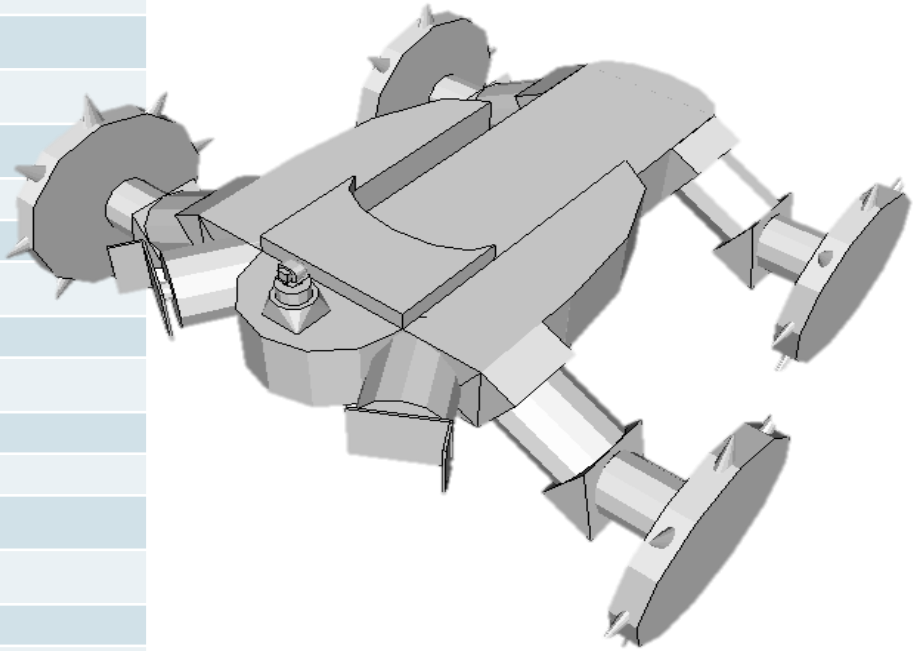
Turn the motor in order to move bot in left side or right side, so the bot will get aligned.

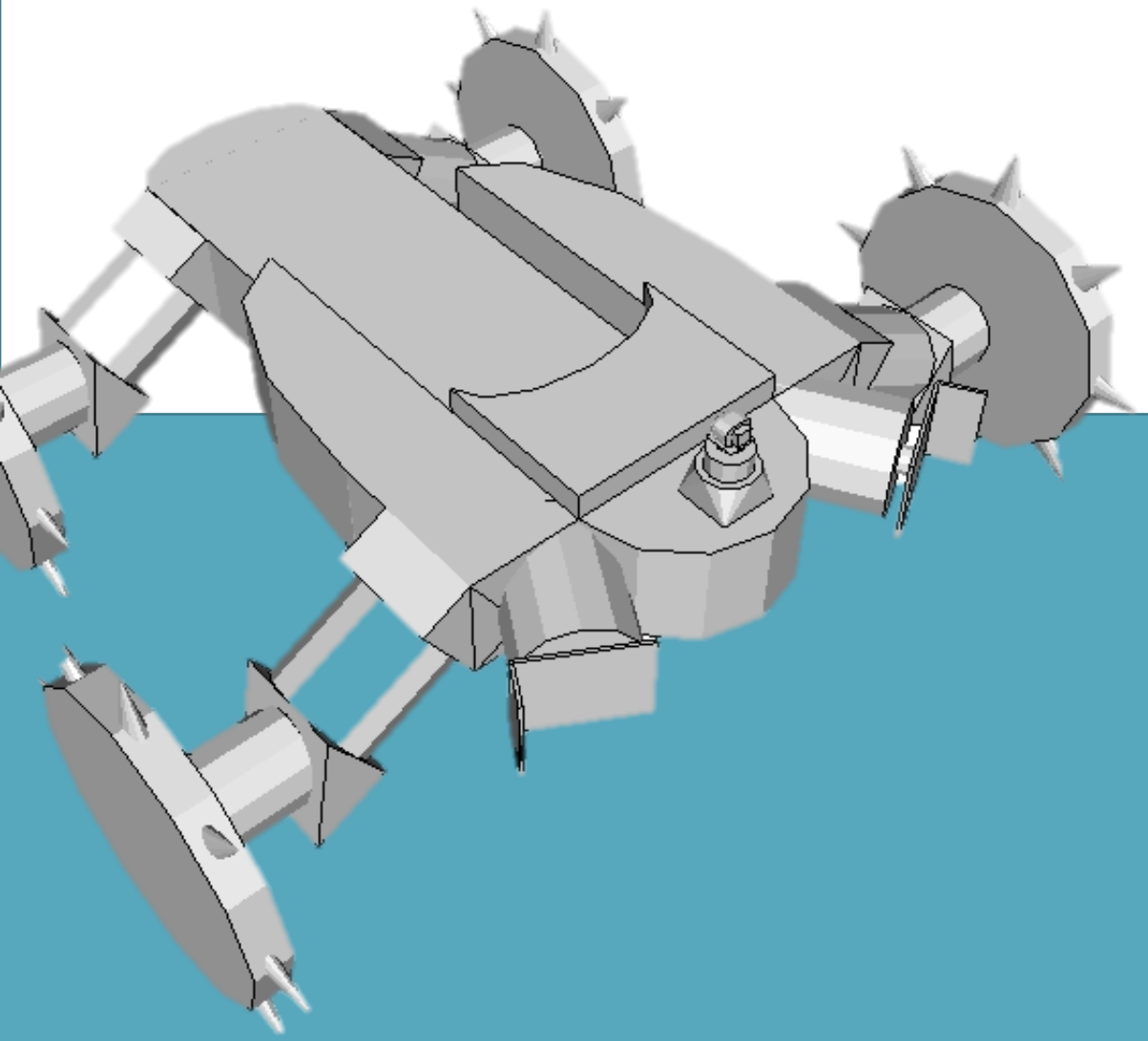
6 Step 6

Use the ejection mechanism to remove weed

Budget and coasting

Components Name	Quantity	Price
Through holes PCB	1 Unit	20 rs
ATMega328 wit boot bootloader	1 Unit	90 rs
5mm LED	4 Unit	10 rs
330Ohm Resistor	3 Unit	10 rs
10kOhm Resistor	4 Unit	10 rs
16MHz Crystal	1 Unit	10 rs
22pF Ceramic Capacitors	2 Unit	10 rs
0.1uF Ceramic Capacitors	2 Unit	10 rs
10uF Electrolytic Capacitors	2 Unit	10 rs
LM7805 5V Regulator	1 Unit	20 rs
Diode 1N4001	4 Unit	15 rs
Resettable Fuse PTC (300mA)	1 Unit	10 rs
28-Pin DIP Socket	1 Unit	40 rs
Push Button Reset Switch	1 Unit	10 rs
6-Pin Female Headers	1 Unit	30 rs
8-Pin Female Headers	1 Unit	30 rs
6-Pin Right Angle Header	1 Unit	30 rs
6-Pin Right Angle Header	1 Unit	20 rs
0.1uF Capacitor	1 Unit	5 rs
DC Barrel Jack	1 Unit	20 rs
2-pin screw terminal	1 Unit	20 rs
HCSR04	3 Unit	300 rs





Agro Bot

THANK YOU