A

Major Project

On

SMART AGRICULTURAL ROBOT USING RASPBERRY PI

(Submitted in partial fulfillment of the requirements for the award of Degree)

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

by

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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2018-22

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the project entitled **"SMART AGRICULTURAL ROBOT USING RASPBERRY PI"** being submitted by **A. DHARANI LAXMI (187R1A0562), G. SRI LAVANYA (18C21A0510) & P. HARSHA VARDHAN (187R1A05A6)** in partial fulfillment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering to the Jawaharlal Nehru Technological University Hyderabad, is a record of bonafide work carried out by him/her under our guidance and supervision during the year 2021-22.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

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Submitted for viva voice Examination held on _____

ACKNOWLEGDEMENT

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ABSTRACT

This is the endeavor from the motivation of the farmers working in their field who are only amped up for the storms and bore wells for the water arrangement of their property. As of late, ranchers screen and work water system physically by killing ON the siphon when required. The proposed framework means building up a robot equipped for performing tasks, for example, a programmed water system. It likewise gives manual control when required and monitors the stickiness with the assistance of moistness sensors. To develop nutritious harvests and sound yields ranchers need to bind check the perfect measure of manures. Ranchers today spend a lot of money on machines that assist them with diminishing work and increment the return of yields however the benefit and effectiveness are less. Along these lines robotization is that perfect response to beat all the insufficiencies by making machines that perform one movement and automating it to extend the yield on an outsized scale.

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1.INTRODUCTION

1.INTRODUCTION

In our country, we don't have sufficient machinery factors in the agricultural sector and it increases the load of labour on our farmers. Now it is the time to automate the world to move across this problem. In India, 70% of people depend on agriculture. So, we would like to review the agriculture. The innovative idea of our project is to automate the method of Irrigation and inspection of soil nutrients periodically to yield nutritious crops. The farming systems like irrigation, fertilization, weeding and so on. All the procedures are advance to altering the system in cultivating which works without the individual's capacity necessity.

Physically water system technique experiences different issues. The propensity of manual work continues decreasing. the individual force lack is one of the most significant issues confronted ceaselessly to all or any ranchers. on account of work deficiency the ranch cost ought to be expanded. Along these lines, it's not financially gainful for all ranchers.

Now a day's instrumentation and system play a crucial role. So, we develop a system for "Agri Bot" using a microcontroller which is extremely practical and gainful. On account of robotization the work gets simplest, errorless and it sets aside cash also. So, we build up a framework for "Agri Bot" utilizing a microcontroller which is amazingly efficient and useful. Consistent with microcontroller program, after a long way or a while instant the humidity sensor fitted robotic arm should be dipped into the soil and if needed it'll activate the pump via Bluetooth module.

The Same operation is repeated after a while delay. So, there's no more labor work. It gives information about the weather of soil nutrients.

For the present work, the Raspberry Pi is used as dimness devices were filled by a Debian-based Linux OS, named Raspbian, which was in like manner the direction of the Raspberry Pi Foundation and will be booted by an external SD or scaled downscale SD card.

It is justifiable that not at all like the Arduino hubs, the Raspberry Pi had expanded computational and handling power, with the dynamic nature of transforming them into PCs and sensors.

The utilization of technologies in agriculture needs automation techniques. Be that as it may, any place robotization had been executed and populace had been supplanted via programmed apparatus, the yield has been improved. Thus there must execute present day science and innovation inside the agribusiness part for expanding the yield and ultimately helps in effective crop quality or quality production. This robot should be ready to do many complex and time-consuming operations quickly.

2.SYSTEM ANALYSIS

2.SYSTEM ANALYSIS

2.1 SYSTEM ANALYSIS

System Analysis is the important phase in the system development process. The System is studied to the minute details and analyzed. The system analyst plays an important role of an interrogator and dwells deep into the working of the present system. In analysis, a detailed study of these operations performed by the system and their relationships within and outside the system is done. A key question considered here is, “what must be done to solve the problem?” The system is viewed as a whole and the inputs to the system are identified. Once analysis is completed the analyst has a firm understanding of what is to be done.

2.2 EXISTING SYSTEM

In the current agribusiness robots basic small scale controllers like atmega, which are inbuilt for huge amounts of improvement sheets out there like Arduino are used in a blend with fewer precision sensors which bring about poor productivity.

These systems are as often as possible replaced with cloud apply self-sufficiency which is a rising field that mixes the thoughts of cloud advances and fix robots. it's an irksome development maintained the upsides of quick fall in costs of servers, server ranches, and broadband access.

There are a couple of systems during which a human head may control the robot from a division by sending orders and getting information by methods for a correspondence mastermind.

Since all these systems aren't efficient and require constant human monitoring, they not only increase the labor burden but also make them expansible and inaccessible for an outsized scale of farmers across the world.

2.3 PROPOSED SYSTEM

The proposed framework targets planning multipurpose self-governing farming automated vehicles that might be controlled through Internet/Bluetooth/Wi-Fi for watering the crops, removing weed, plowing, seeding, and irrigation systems. It uses one board computers (SBC's) called raspberry pi which isn't only compatible with the newest camera modules and sensors, but also possess exceptionally high-performance computational capabilities.

The objectives of the proposed structure are to tunnel the earth contingent upon moistness level inside the earth, to wrinkle the seeds with teeth looks like structure at the top to show the most significant layer of soil down, to close the seeds and level the base normally and to deftly water framework system by sprinkling water with a guide inside the field.

2.4 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. Three key considerations involved in the feasibility analysis are

- Economic Feasibility
- Technical Feasibility
- Social Feasibility

2.4.1 ECONOMIC FEASIBILITY

The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on project, which will give best, return at the earliest. One of the factors, which affect the development of a new system, is the cost it would require.

The following are some of the important financial questions asked during preliminary investigation:

- The costs conduct a full system investigation.
- The cost of the hardware and software.
- The benefits in the form of reduced costs or fewer costly errors.

Since the system is developed as part of project work, there is no manual cost to spend forthe proposed system. Also all the resources are already available, it give an indication of the system is economically possible for development.

2.4.2 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

2.4.3 BEHAVIORAL FEASIBILITY

This includes the following questions:

- Is there sufficient support for the users?
- Will the proposed system cause harm?

The project would be beneficial because it satisfies the objectives when developed and installed. All behavioral aspects are considered carefully and conclude that the project is behaviorally feasible.

2.4 SOFTWARE & HARDWARE REQUIREMENTS

2.4.1 SOFTWARE REQUIREMENTS:

Python IDE:

Thonny may be an another IDE (coordinated advancement condition). Utilizing Thonny, it's currently a lot simpler to discover to code. Thonny accompanies Python 3.6 inherent, so you don't get the opportunity to introduce anything. Simply open up the program, which you willdiscover under Menu> Programming. It offers huge amounts of cutting edge highlights not right now accessible inside the Python 3 (IDLE) program, which stays included with Raspbian.

2.4.2 HARDWARE REQUIREMENTS:

Raspberrypi3

This Model B+ is that the ongoing creation Raspberry Pi 3 highlighting a 64-piece processor running at 1.4 GHz. It consolidates upgraded inbuilt double band Wi-Fi, Bluetooth 4.2/BLE, and quicker Ethernet. It keeps up an equal mechanical impression. Adafruit made/brand cases will at present fit yet different cases won't, particularly ones that rely upon segment area or have an inbuilt a heat sink.

Arduino Uno

The Arduino is a microcontroller board which bolsters the ATmega328. it's 20 computerized input/yield pins (of which 6 are regularly utilized as PWM yields and 6 are frequentlyutilized as simple sources of info), a 16 MHz resonator, a USB association.

DC Geared Motors

An apparatus engine is an across the board mix of an engine and gearbox. The expansion of a rigging head to an engine decreases the speed while expanding the torque yield. The most significant parameters concerning gear engines are speed (rpm), torque (lb-in), and productivity (%). To choose the most reasonable rigging engine for your application. This is 12V DC engine which has a gearbox of 45mm measurement. The planetary sort gearbox of this engine has a metal riggings and an inside shaft. The Shaft of the engine is stacked with bearing for wear opposition and smooth activity.

Soil Moisture Sensor

An apparatus engine is an across the board mix of an engine and gearbox. The expansion of a rigging head to an engine decreases the speed while expanding the torque yield. The most significant parameters concerning gear engines are speed (rpm), torque (lb-in), and productivity (%). To choose the most reasonable rigging engine for your application. This is 12V DC engine which has a gearbox of 45mm measurement. The planetary sort gearbox of this engine has a metal riggings and an inside shaft. The Shaft of the engine is stacked with bearing for wear opposition and smooth activity.

Bluetooth Module HC-05

The Bluetooth Transceiver HC-05 TTL Module (With EN Pin) Breakout is that the most recent Bluetooth remote sequential link! This adaptation of the supported Bluetooth utilizes the HC -05 / H * C 06module. These modems function as a sequential (RX / T * X) pipe.

DC Water Pump Motor

A DC engine is any of a classification of revolving electrical engines that changes over DC power

into vitality, the premier regular sorts accept the powers created by attractive fields. A wide range of DC engine have some inward systems to intermittently alter the course of the present engine.

Robot Chasis 4 WD

A robot might be a machine that will play out certain assignments consequently or with direction. Mechanical autonomy is normally a blend of computational insight and physical machines (engines). Because of their significant level of execution and unwavering quality, the robot gets the extravagant fame in our way of life.

L298N Driver Module

The L298N Motor Driver Module might be a high voltage Dual HBridge made by the ST organization it's intended to just acknowledge standard TTL voltage levels. H connect drivers are wont to drive inductive burdens that need forward and switch work with speed control like DC Motors, and Stepper Motors. This Dual HBridge driver is equipped for driving voltage up to 46V.

Servo Motor

Servo Motor 90 degrees toward every path making it 180 degrees servo engine. It is aDigital where gets and Processes PWM signal quicker.

Pi Camera 5 MP

This camera accomplices with the BCM2835 processor and a higher transmission limit interface which passes on pixel information from the camera back to the processor. It is ideal for little Raspberry Pi undertakings which have fundamentally no space remittance.

3.ARCHITECTURE

3.ARCHITECTURE

3.1 SYSTEM ARCHITECTURE

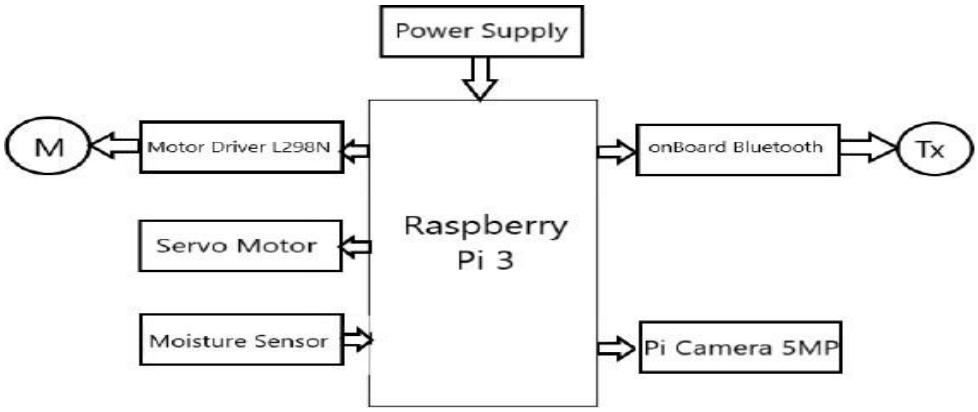


Figure3.1: Raspberry pi interfacing with different modules

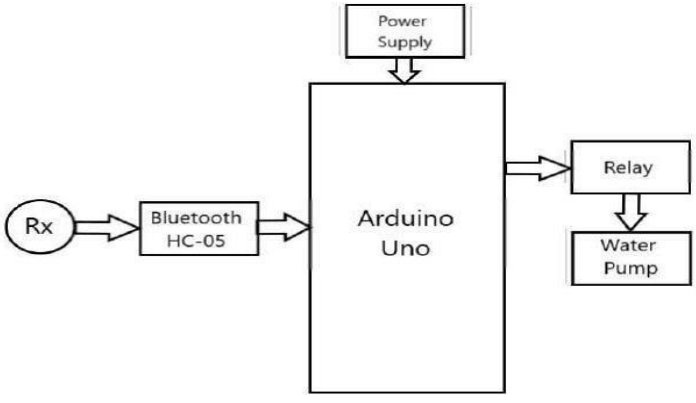


Figure 3.2 : Arduino interfacing with Bluetooth controlled relay

3.2 Module Interfacing

Raspberry Pi with Motor Driver L298N

L293D is used to drive DC Motor by using the control signals from Raspberry pi. Here DC motor operates with 9V and thus the output from Raspberry pi is simply up to 3.3V, the motor driver IC L293D will have two kinds of power supply VCC1 it's for internal logic translation (5V) and VCC2 is power Vec for drivers to DC motor terminals (4.5V to 36V), and by using low input control signals this IC can drive DC motors. It gives continuous output current up to 600 mA. The input pins of motor drivers are connected to the GPIO pins of Raspberry Pi and output pins are connected to the DC gear motor. we'll control the motion of the robot by providing a LOW and HIGH signal to the connected GPIO pins accordingly.

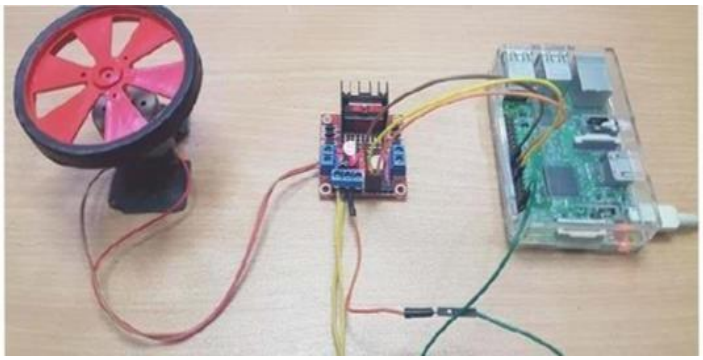


Figure 3.3 : Raspberry Pi with Motor Driver L298N

Raspberry Pi with Servo Motor

Raspberry Pi with A Servo Motor may be a simple device that consists of a DC Motor, Gears, and a FeedBack based Position system, the most advantage of a Servo Motor is its ability to carry the position of its shaft. it's connected with the arm of the robot to supply up and down motion to the arm Servo Motor.

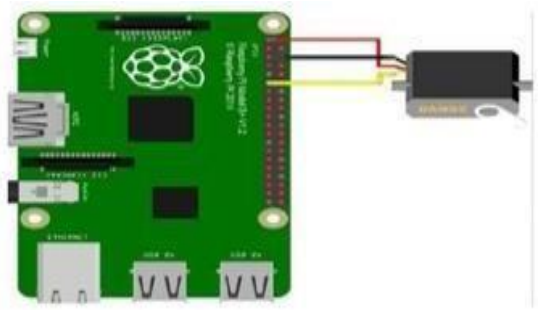


Figure 3.4 :Raspberry Pi with Servo Motor

Raspberry Pi with Soil Moisture Sensor

The soil moisture sensor consists of two probes that are wont to measure the volumetric content of water. The 2 probes allow the present to undergo the soil then it gets the resistance value to live the moisture value. We've fitted this sensor in one among the arm of our robot.

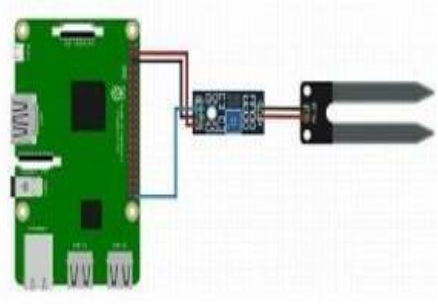


Figure 3.5 : Raspberry Pi with Soil Moisture Sensor

Arduino Uno with Bluetooth Controlled Water Pump Relay

Used an HC-05 Bluetooth module, a relay switch, a pump, and an Arduino to make a wireless automated irrigation systems. The goal was to determine a wireless protocol for switching a pump on and off employing a simple app on a smartphone. The relay switch controls the facility to the pump. HC-05 handles the Bluetooth, and therefore the Uno reads the Bluetooth module to regulate the relay.

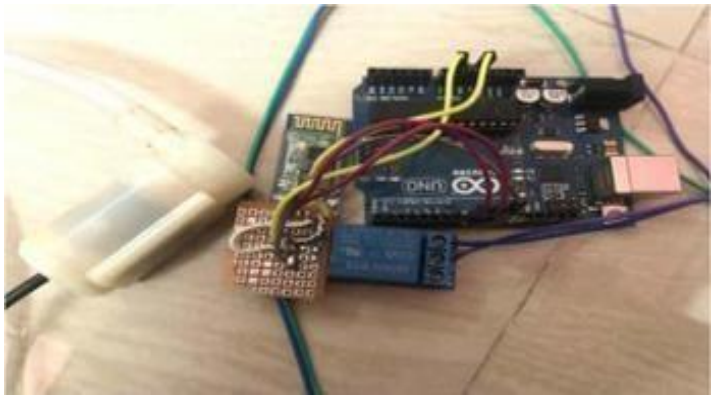


Figure 3.6 : Arduino Uno with Bluetooth Controlled Water Pump Relay

Object Detection using Pi Camera

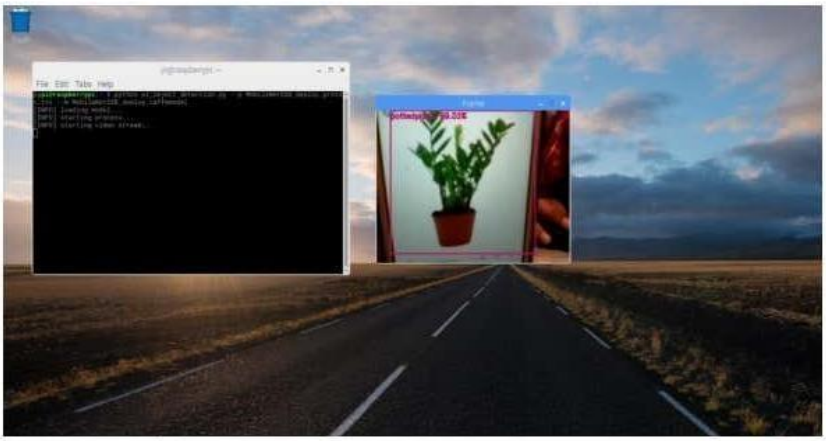


Figure 3.7 : Object Detection using Pi Camera

3.3 USE CASE DIAGRAM

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses.

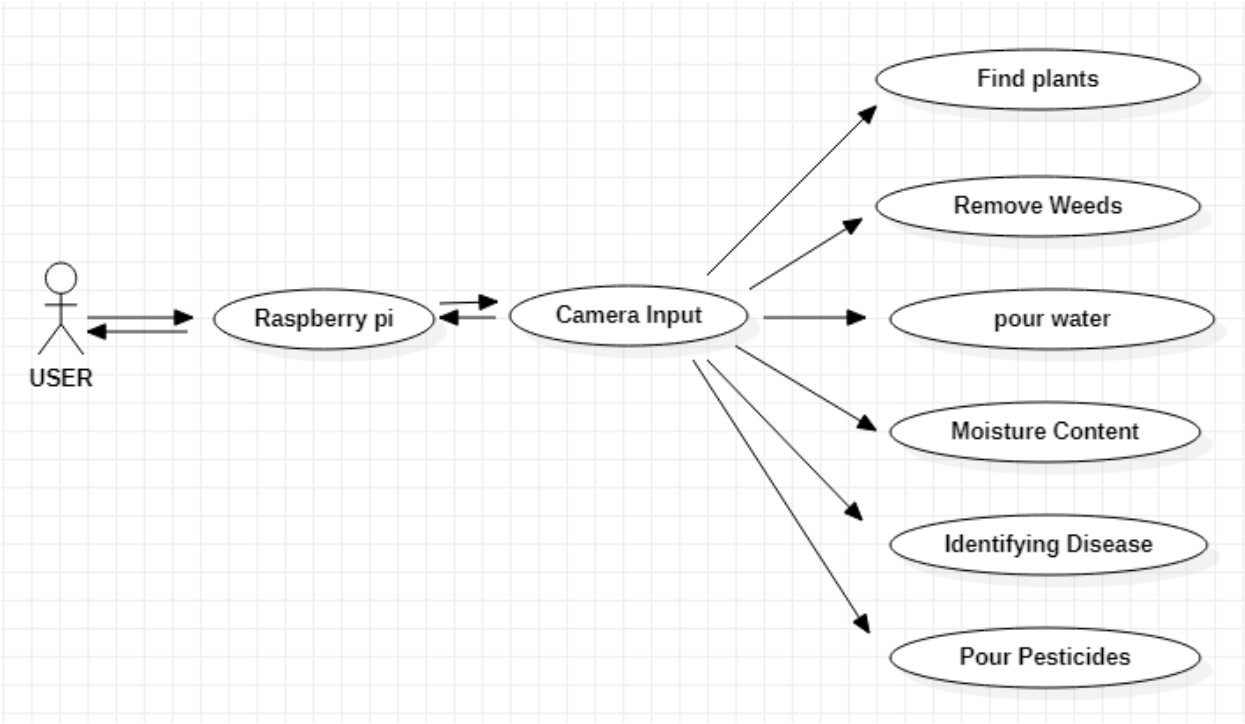


Figure 3.8: Use Case Diagram for smart agricultural robot using raspberry pi

3.4 CLASS DIAGRAM

Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also forconstructing executable code of the software application.

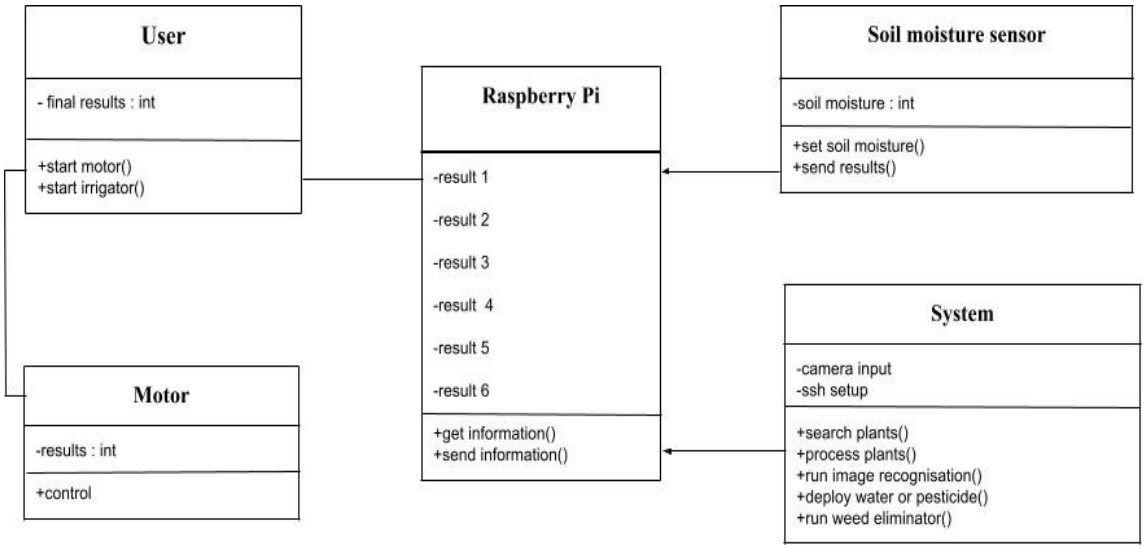


Figure 3.9: Class Diagram for smart agricultural robot using raspberry pi

3.5 SEQUENCE DIAGRAM

A sequence diagram or system sequence diagram shows object interactions arranged in time sequence in the field of software engineering. It depicts the objects involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of scenario.

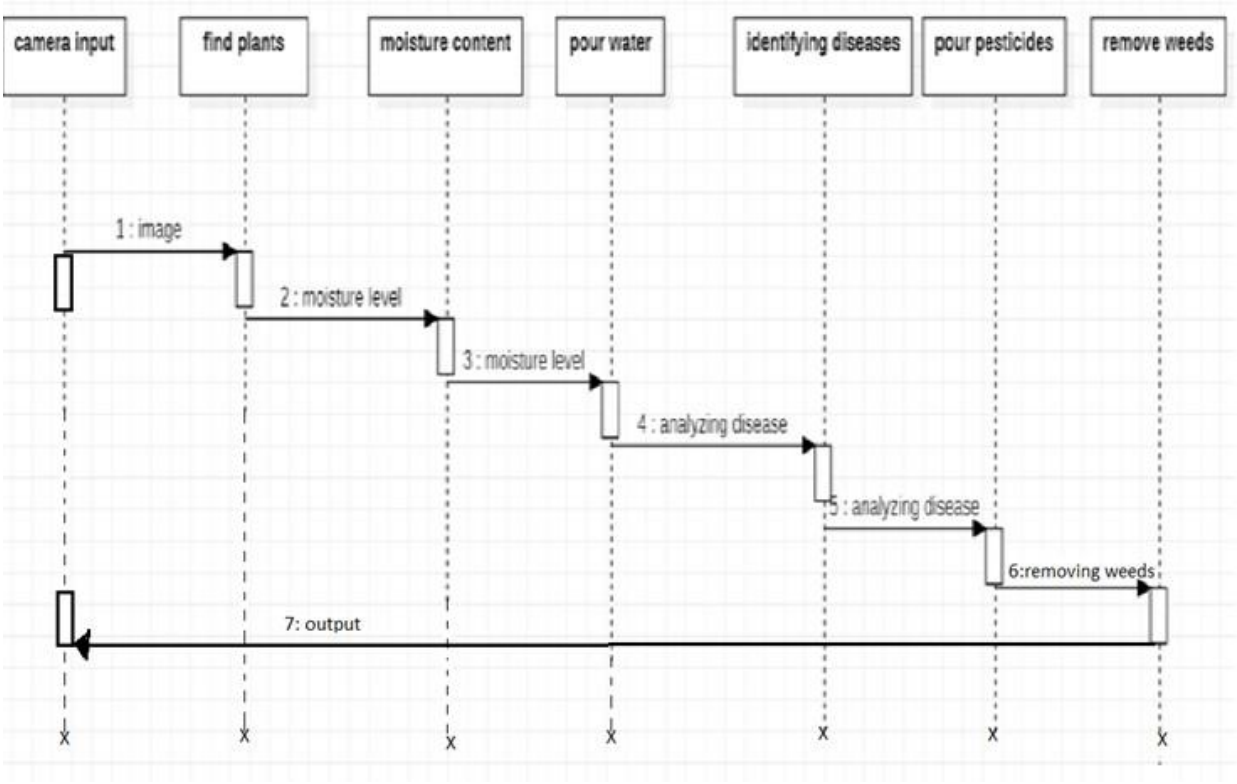


Figure 3.10 : Sequence Diagram for smart agricultural robot using raspberry pi

3.6 ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actionswith support for choice, iteration and concurrency.

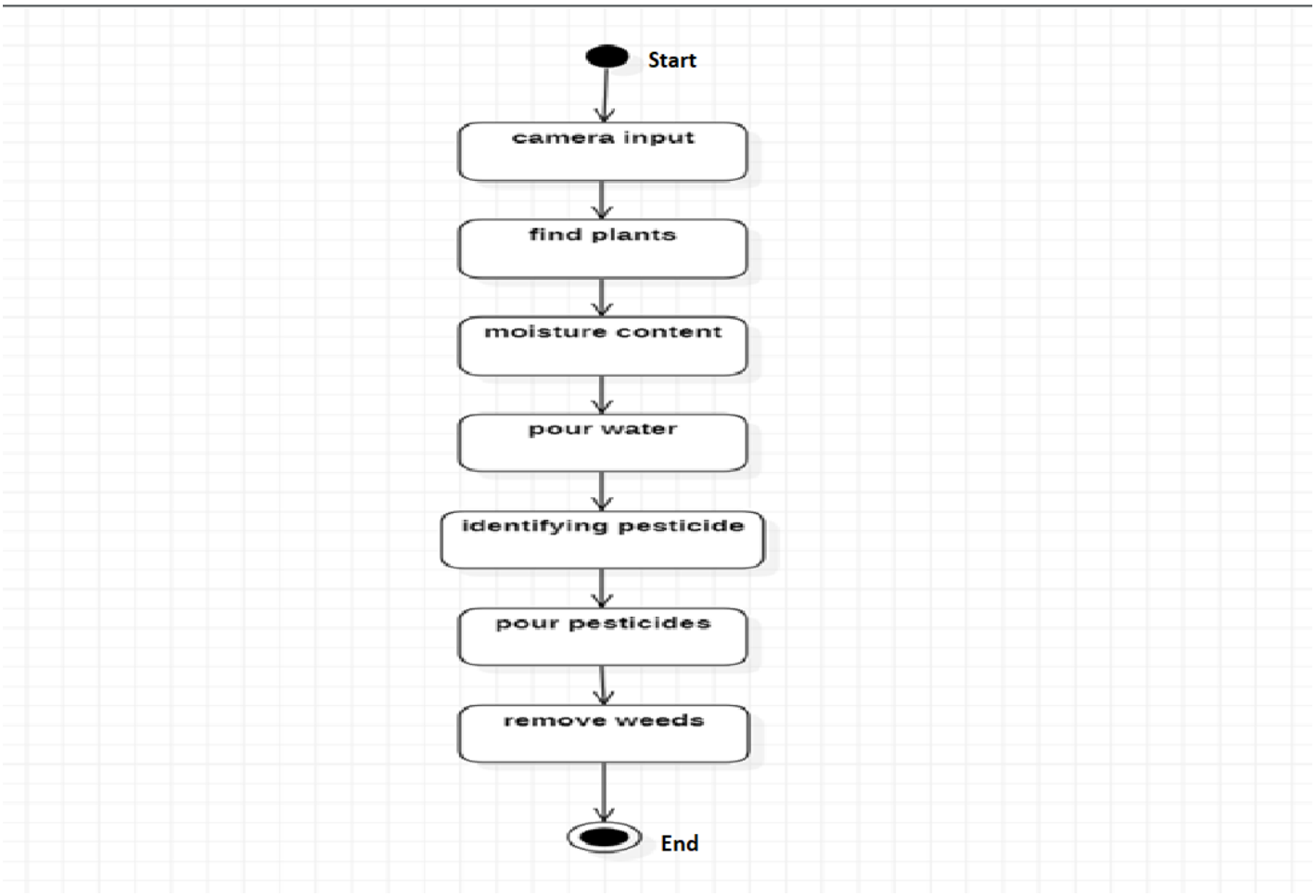


Figure 3.11: Activity Diagram for smart agricultural robot using raspberry pi

4.IMPLEMENTATION

4.1 IMPLEMENTATION

Code Snippets

```
#gardener.py
LIGHT_PIN = 20
PUMP_PIN = 12
import cv2
import numpy as np
from PCA9685 import PCA9685
import threading
import schedule
import time
import atexit
pwm = PCA9685(0x40,debug=False)
pwm.setPWMFreq(50)
pwm.setServoPosition(0,90)
cap = cv2.VideoCapture(0)
cap.set(3,480)
cap.set(4,320)
_,frame = cap.read()
rows,cols,_ = frame.shape
x_medium = int(cols/2)
center = int(cols/2)
position = 90 # degrees
try:
import RPi.GPIO as GPIO
except RuntimeError:
print("Error importing RPi.GPIO!")
```

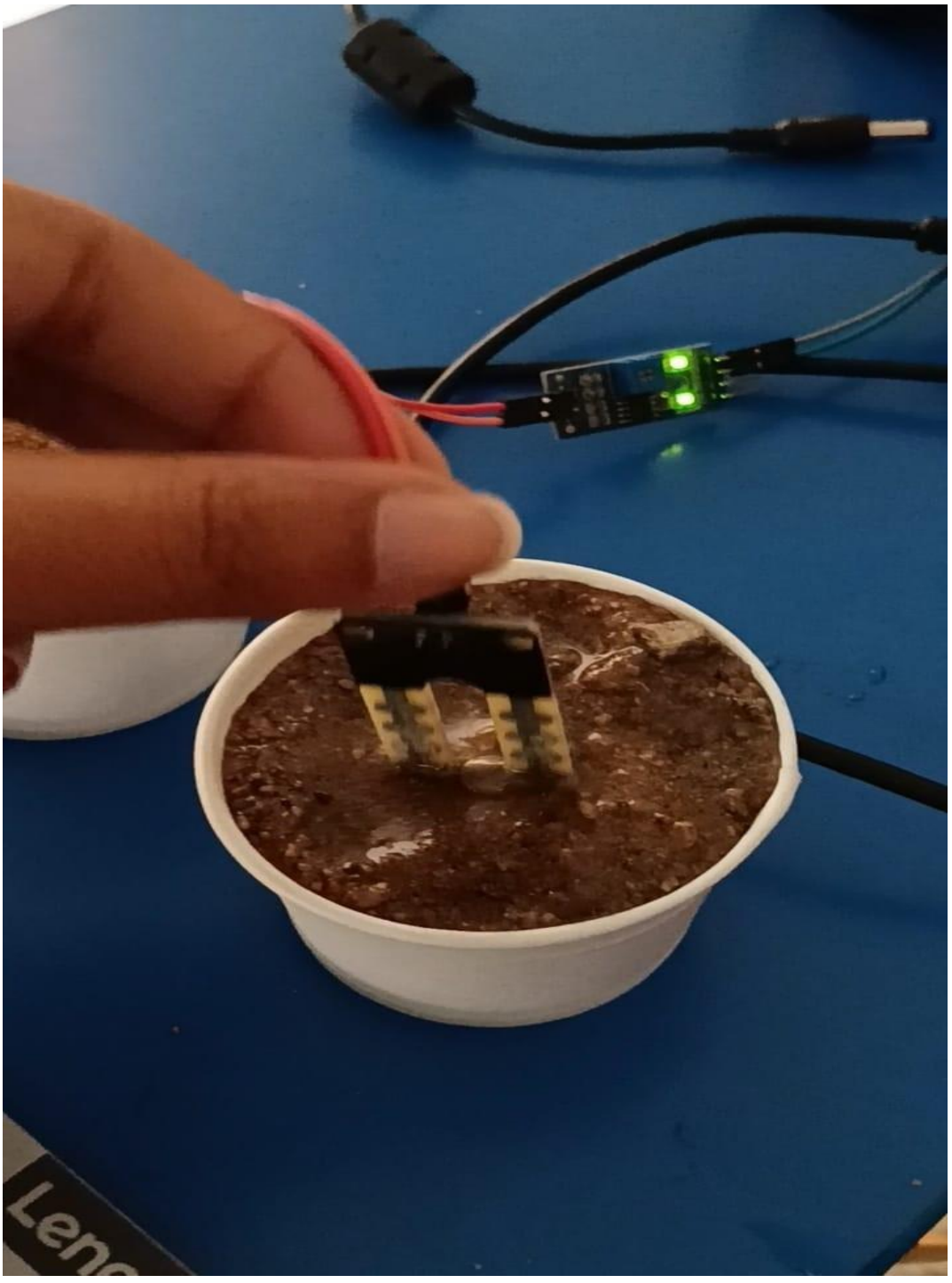
```
GPIO.setmode(GPIO.BCM)
GPIO.setup(LIGHT_PIN,GPIO.OUT)
GPIO.setup(PUMP_PIN,GPIO.OUT)
While True:
_,frame = cap.read()
hsv_frame = cv2.cvtColor(frame,cv2.COLOR_BGR2HSV)
#green leaves color
low_red = np.array([161,155,84]0
high_red = np.array([179,255,255])
red_mask = cv2.inRange(hsv_frame, low_red, high_red)
_,contours,_ = cv2.findContours(red_mask, cv2.RETR_TREE,
cv2.CHAIN_APPROX_SIMPLE)
contours = sorted(contours, key=lambda x:cv2.contourArea(x),reverse=True)
for cnt in contours:
(x, y, w, h) = cv2.boundingRect(cnt)
x_medium = int((x + x + w) / 2)
break
cv2.line(frame, (x_medium, 0), (x_medium, 480), (0,255,0), 2)
cv2.imshow("Frame", frame)
key = cv2.waitKey(1)
if key == 27:
break
#Move robot
```

```
if x_medium < center – 30:
position +=1.5
elif x_medium > center + 30:
position -= 1.5
pwm.setServoPosition(0,position)
cap.release()
cv2.destroyAllWindows()
class GardenerAction(object):
turnOn = “on”
turnoff = “off”
def threaded(job_func,action=GardenerAction.turnOn, forLength=None):
job_thread = threading.Thread(target=job_func, kwargs={‘action’:action,
‘forLength’:forLength})
job_thread.start()
def water(action=GardenerAction.turnOn, forLength=None):
toggleComponent(PUMP_PIN,action, forLength)
def light(action=GardenerAction.turnOn, forLength=None):
toggleComponent(LIGHT_PIN,action, forLength)
def toggleComponent (pin, action=GardenerAction.turnOn, forLength=None):
if (forLength is not None):
GPIO.output(pin,GPIO.HIGH)
```

```
time.sleep(forLength)

GPIO.output(pin,GPIO.LOW)

else:

if action == GardenerAction.turnOn: GPIO.output(pin, GPIO.HIGH)

else:

GPIO.output(pin,GPIO.LOW)

def exit_handler():

GPIO.cleanup()

atexit.register(exit_handler) # Turn water on every 30 min for 10 sec

schedule.every(30).minutes.do(threaded, water, forLength=10)

#schedule.every().hour.do(threaded, light, forLength=300)
#schedule.every().day.at("10:30").do(threaded,light,action=GardenerAction.turnOn)
#schedule.every().day.at("12:30").do(threaded,light,action=GardenerAction.turnOff)
#schedule.every().monday.do(threaded, water, forLength=30)
#schedule.every().wednesday.at("13:15").do(threaded, light, forLength=30)
while True:
schedule.run_pending() time.sleep(1)
```

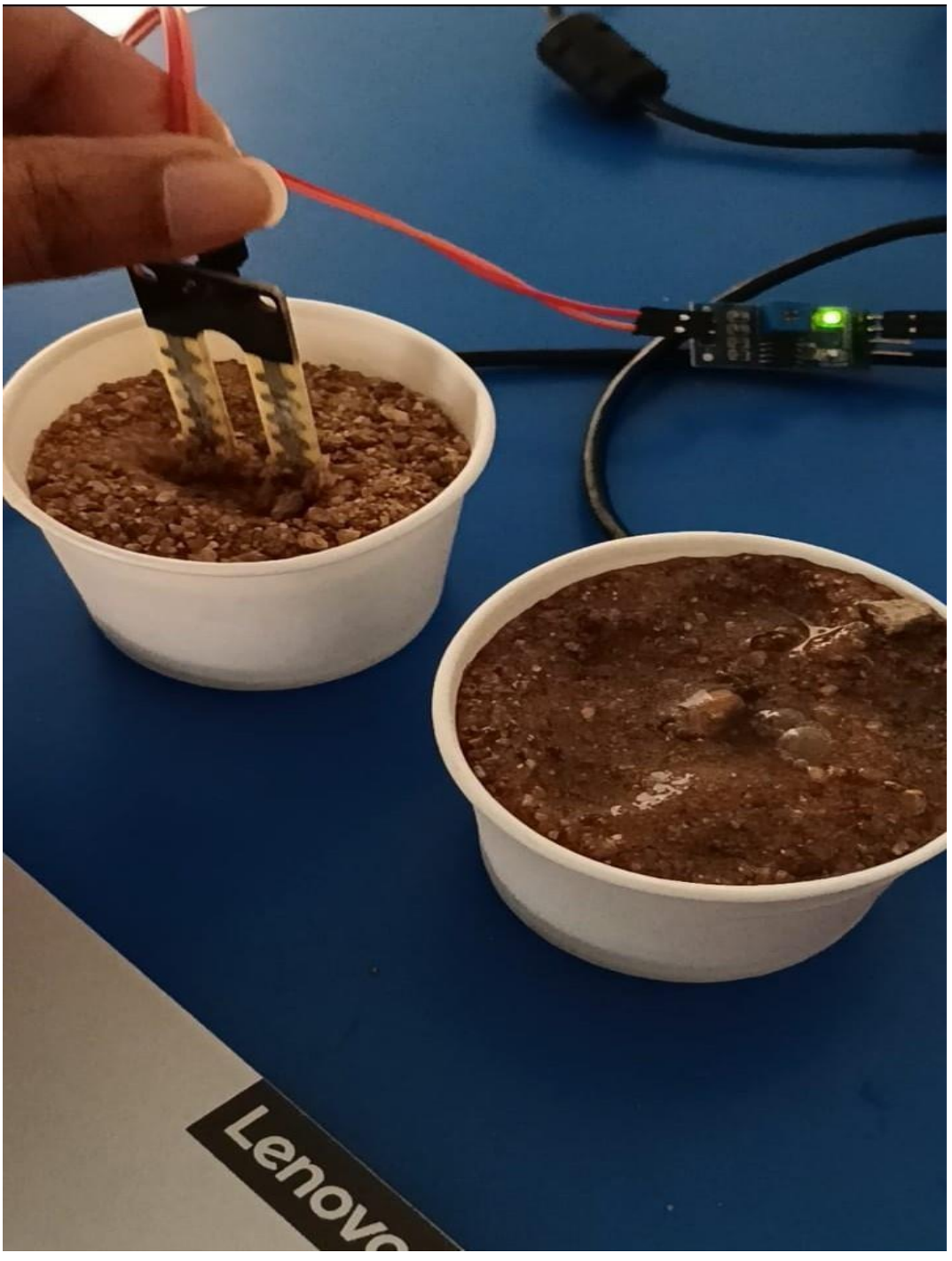
5.SCREENSHOTS

5.1 Soil moisture sensor when kept in wet soil



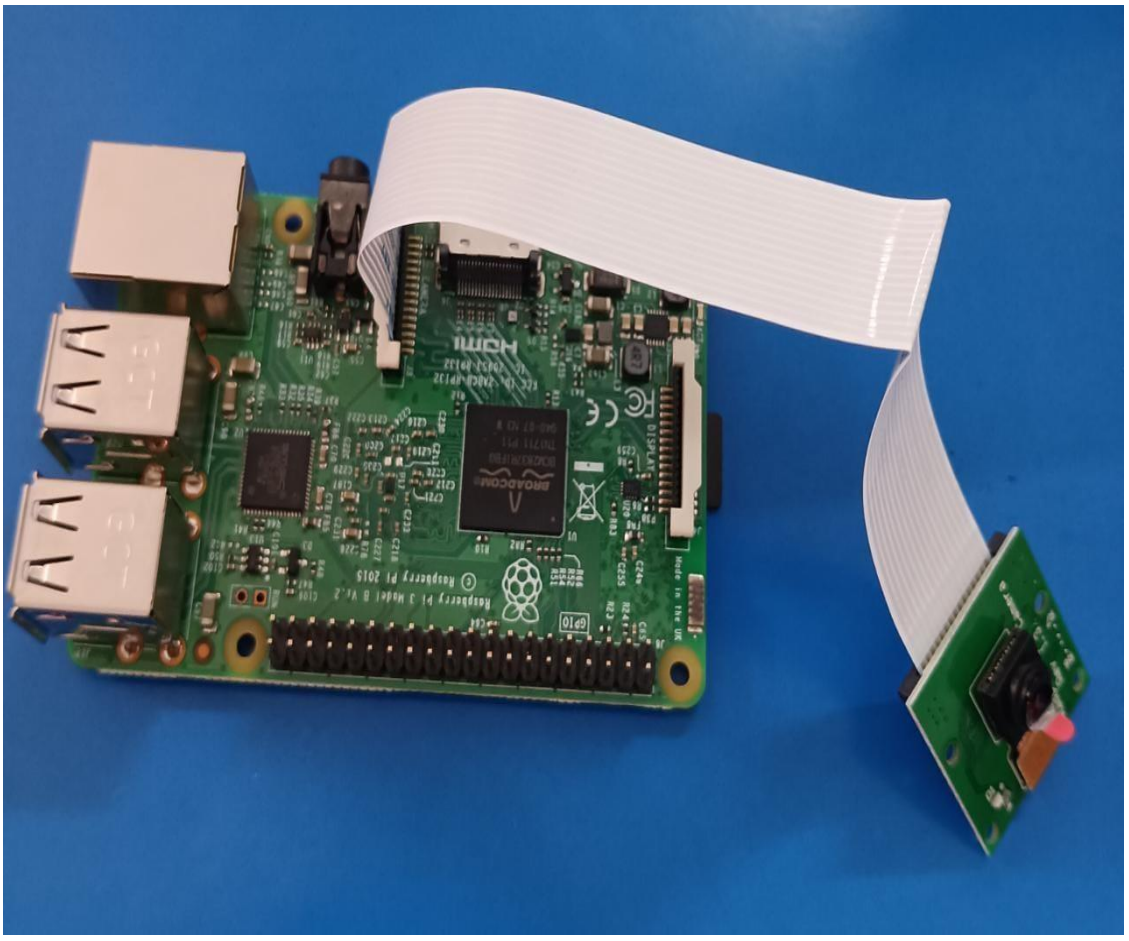
Screenshot 5.1 Soil moisture sensor when kept in wet soil

5.2 Soil moisture sensor when kept in dry soil



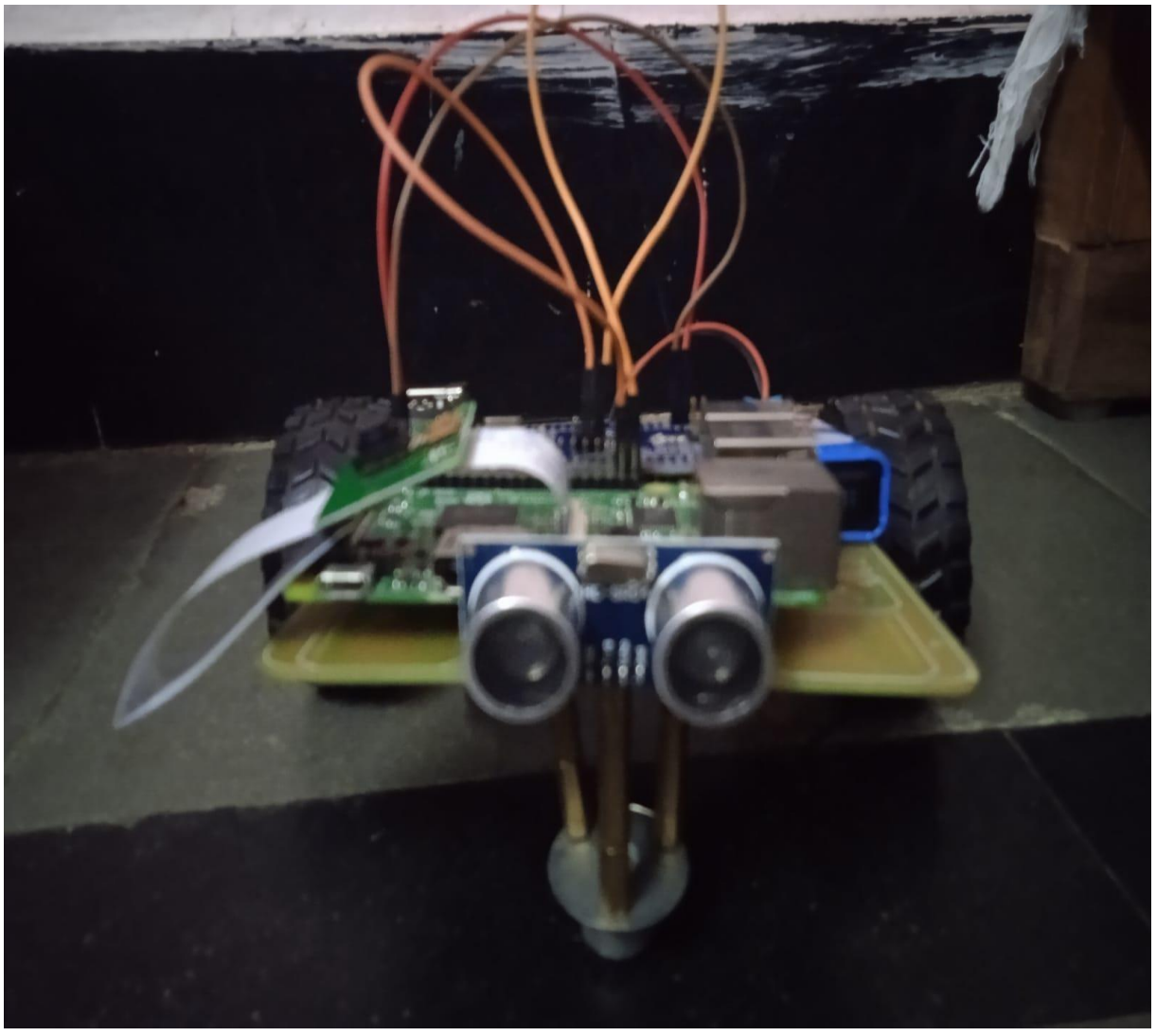
Screenshot 5.2 Soil moisture sensor when kept in dry soil

5.3 Pi camera connected to Raspberry Pi



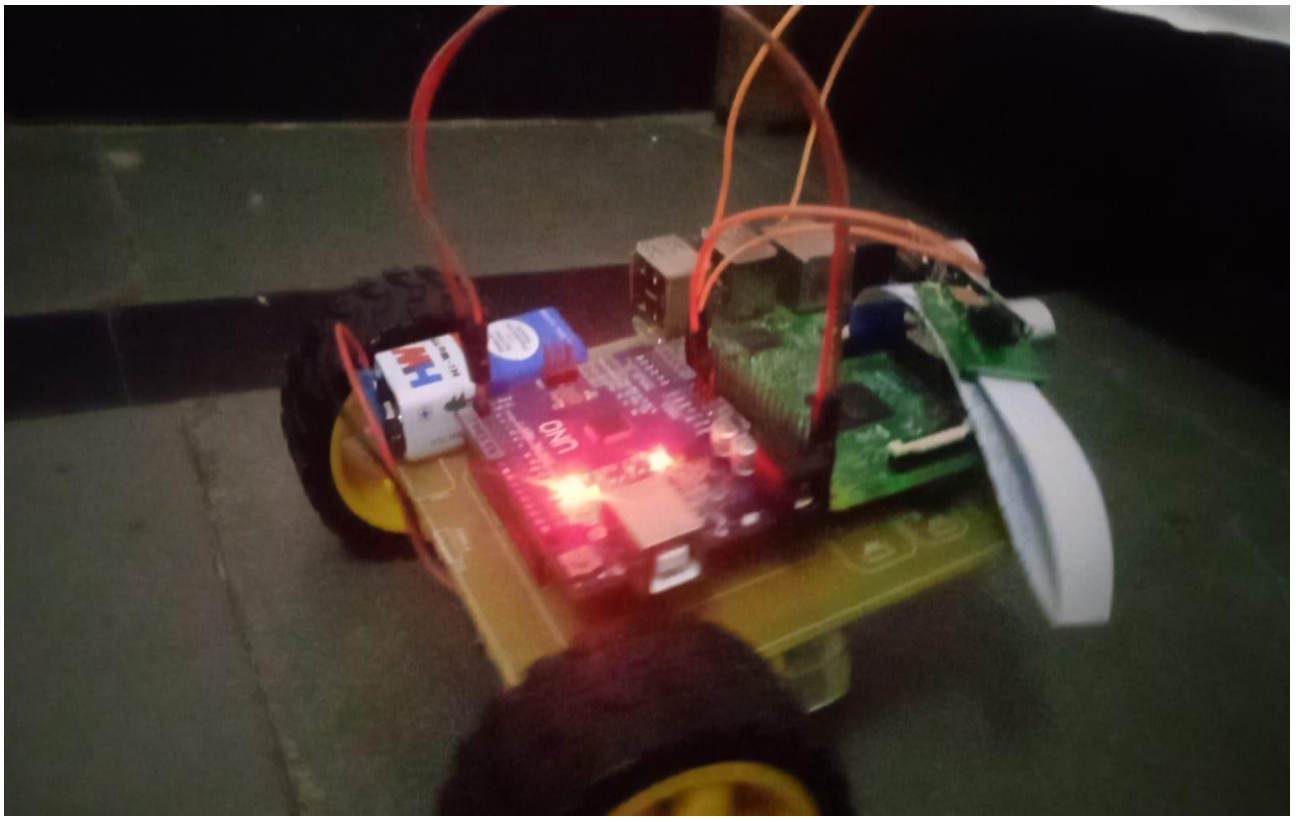
Screenshot 5.3 Pi camera connected to Raspberry Pi

5.4 Robot chassis connected to Arduino Uno



Screenshot 5.4 Robot chassis connected to Arduino Uno

5.5 Working of Robot chassis when connected to Arduino Uno



Screenshot 5.5 Working of Robot chassis when connected to Arduino Uno

5.6 Water irrigation system

Screenshot 5.6 Water irrigation system

6.TESTING

6.TESTING

Implementation and Testing:

Use is one of the superior critical endeavors in the endeavor is that the familiarize which one has with be vigilant considering the way that all the undertakings endeavored during the errand will be outstandingly instinctive. Use is the most vital stage in achieving a productive structure and giving the customers conviction that the new system is useful and effective. Each program is attempted independently at the hour of progression using the model data and has affirmed that these activities interface together inside the way spread out in the program-specific. the pc system and its condition are attempted according to the general tendency of the customer.

Implementation

The execution stage is a littler measure of inventiveness than framework structure. it's basically worried about client preparing, and record change. The framework could likewise be requiring broad client preparing. The underlying parameters of the framework ought to be adjusted because of programming. a simple methodology is given with the goal that the client can comprehend the different capacities obviously and rapidly. the different reports are regularly acquired either on the inkjet or framework printer, which is out there at the removal of the client. The proposed framework is incredibly simple to actualize. by and large execution is utilized to mean the strategy for changing over a substitution or reconsidered framework structure into an operational one.

Testing

Testing is that technique where the test data is arranged and is used for testing the modules freely and later the endorsement given for the fields. By then the structure testing happens which guarantees that each one piece of the system property fills in as a unit. The test data should be picked such it gifted every possible condition. testing is that the state of execution that highlighted ensuring that the structure works definitely and capably before the particular movement begins.

System Testing

Testing has become a basic bit of any system or undertaking especially inside the field of data development. The essentialness of testing may be a procedure for supporting if one is set up to move further, be it to keep an eye in the unlikely event that one is equipped to withstand the fundamentals of a specific condition can't be underplayed which is the explanation testing before progress is so fundamental. Right, when the item is made before it's given to the customer to use the item should be attempted whether it's understanding the point that it's made. This testing incorporates various sorts through which one can guarantee the item is strong. The program was attempted brilliantly and instances of execution of the program for a social event of data are reiterated. Thusly the code was altogether checked for all possible right data and along these lines the outcomes were moreover checked.

Module Testing

To discover bungles, each module is attempted autonomously. this license us to recognize botches and authentic it without impacting various modules. At whatever point the program isn't satisfying the predefined work, it must be amended to support the foreordained result. Along these lines all the modules are only attempted from the base up starting with the most humble and least modules and proceeding to the subsequent level. Each module inside the system is attempted autonomously. for instance the work gathering module is attempted freely. This module is attempted with a substitute action and its unpleasant execution time and thusly the eventual outcomes of the test are differentiated and the results that are orchestrated genuinely. The relationship shows that the results proposed system works viably than the all-encompassing structure. Each module inside the structure is attempted freely. during this system the benefit course of action and occupation booking modules are attempted freely and their relating results are gotten which decreases the method holding uptime.

Integration Testing

After the module testing, the mixing testing is applied. When linking the modules there could also be a chance for errors to occur, these errors are corrected by using this testing. during this system all modules are connected and tested. The testing results are very correct. Thus the mapping of jobs with resources is completed correctly by the system.

Acceptance Testing

Right when that customer finds no significant issues with its precision, the structure experiences a last affirmation test. This test avows that the system needs the essential goals, targets, and necessities set up during examination without certified execution.

1.	Initialization	Pass	Check all the sensor's data with standard values.
2.	Target Identification	Pass	Check whether the crop is in aframe "field of vision" of the camera.
3.	Course Adjustment	Pass	Rotate around the axis until the robot finds the crop.
4.	Distance Calculation	Pass	Calculate the distance between thecrop and the robot.
5.	Target Pursuit	Pass	Move closer/towards the crop untilthe distance between the robot and crop becomes "11cm".
6.	Sensor deployment	Pass	Activities and deploy the soil moisture sensor in the "pot" (Cropholder) or on the ground.
7.	Read sensor data	Pass	Get the moisture/Water content of the crop.

8.	Irrigate the crop	Pass	Activate the water pump motor and Water the crop till soil moisture sensor triggers on the "Enough" event.
9.	Image processing	Pass	Capture multiple images of the crop and compare them with the internal disease classifier module.
10.	Nebulize crop	Pass	Dusting the crop with an "insecticide" to cure the disease of the crop.
11.	Terminate weeds	Pass	Activate the weed Eliminator motor and perform a 180° weed sweeping moreover with servo motor.

7.CONCLUSION

7. CONCLUSION & FUTURE SCOPE

7.1 CONCLUSION

All perceptions and exploratory tests demonstrate that this undertaking is a finished answer for field exercises and water system issues. By building up this automated vehicle with its performing multiple tasks rural highlights, it conquers the matter of ranchers in cultivating their property in each season regardless of what is the climate that day. Thinking about all the circumstances, the robot coordinated with various such modules are frequently utilized for reclamation and agrarian purposes.

7.2 FUTURE SCOPE

- The traditional farming must be induced with the robotic mechanism and is extremely much required in precision farming.

- There would be remote-controlled robots occupation the agricultural fields so on see the herd.

- Due to the introduction of agricultural robots, there would be less labor required, and a person can plan and implement the operations of the farm by himself without relying on the availability of labor.

8.BIBILIOGRAPHY

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3) https://www.researchgate.net/production/325841365_Agricultural_Robotics_The_Future_of_Robotic_Agriculture

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5) https://www.researchgate.net/publication/254048454_Agribot_-_A_multipurpose_agriculture_robot

8.3 GITHUB REPOSITORY LINK

https://github.com/dharani-allam/smartagriculturalrobotusingraspberrypi.git

SMART AGRICULTURAL ROBOT USING RASPBERRY PI

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Abstract

This is the endeavor from the motivation of the farmers working in their field who are only amped up for the storms and bore wells for the water arrangement of their property. As of late, ranchers screen and work water system physically by killing ON the siphon when required. The proposed framework means building up a robot equipped for performing tasks, for example, a programmed water system. It likewise gives manual control when required and monitors the stickiness with the assistance of moistness sensors. To develop nutritious harvestsand sound yields ranchers need to bind check the perfect measure of manures. Ranchers today spend a lot of money on machines that assist them with diminishing work and increment the return of yields however the benefit and effectiveness are less. Along these lines robotization is that perfect response to beat all the insufficiencies by making machines that perform one movement and automating it to extend the yield on an outsized scale.

***Key Words*: Robotization, Irrigation system, Moisture sensing, Machinery**

1. Introduction

In our country, we don't have sufficient machinery factors in the agricultural sector and it increases the load of labour on our farmers. Now it is the time to automate the world to move across this problem. In India, 70% of people depend on agriculture. So, we would like to review the agriculture. The innovative idea of our project is to automate the method of Irrigation and inspection of soil nutrients periodically to yield nutritious crops. The farming systems like irrigation, fertilization, weeding and so on. All the procedures are advance to altering the system in cultivating which works without the individual's capacity necessity.

2. Literature Survey

Physically water system technique experiences different issues. The propensity of manual work continues decreasing. the individual force lack is one of the most significant issues confronted ceaselessly to all or any ranchers. on account of work deficiency the ranch cost ought to be expanded. Along these lines, it's not financially gainful for all ranchers. Now a day's instrumentation and system play a crucial role. So, we develop a system for "Agri Bot" using a microcontroller which is extremely practical and gainful. On account of robotization the work gets simplest, errorless and it sets aside cash also. So, we build up a framework for "Agri Bot" utilizing a microcontroller which is amazingly efficient and useful. Consistent with microcontroller program, after a long way or a while instant the humidity sensor fitted robotic arm should be dipped into the soil and if needed it'll activate the pump via Bluetooth module.

The Same operation is repeated after a while delay. So, there's no more labor work. It gives information about the weather of soil nutrients. For the present work, the Raspberry Pi is used as dimness devices were filled by a Debian-based Linux OS, named Raspbian, which was in like manner the direction of the Raspberry PiFoundation and will be booted by an external SD or scaled downscale SD card.

It is justifiable that not at all like the Arduino hubs, the Raspberry Pi had expanded computational and handling power, with the dynamic nature of transforming them into PCs and sensors. The utilization of technologies in agriculture needs automation techniques. Be that as it may, any place robotization had been executed and populace had been supplanted via programmed apparatus, the yield has been improved. Thus there must execute present day science and innovation inside the agribusiness part for expanding the yield and ultimately helps in effective crop quality or quality production. This robot should be ready to do many complex and time-consuming operations quickly.

3. Proposed System

The proposed framework targets planning multipurpose self-governing farming automated vehicles that might be controlled through Internet/Bluetooth/Wi-Fi for watering the crops, removing weed, plowing, seeding, and irrigation systems. It uses one board computers (SBC's)

called raspberry pi which isn't only compatible with the newest camera modules and sensors, but also possess exceptionally high-performance computational capabilities. The objectives of the proposed structure are to tunnel the earth contingent upon moistness level inside the earth, to wrinkle the seeds with teeth looks like structure at the top to show the most significant layer of soil down, to close the seeds and level the base normallyand to deftly water framework system by sprinkling water with a guide inside the field.

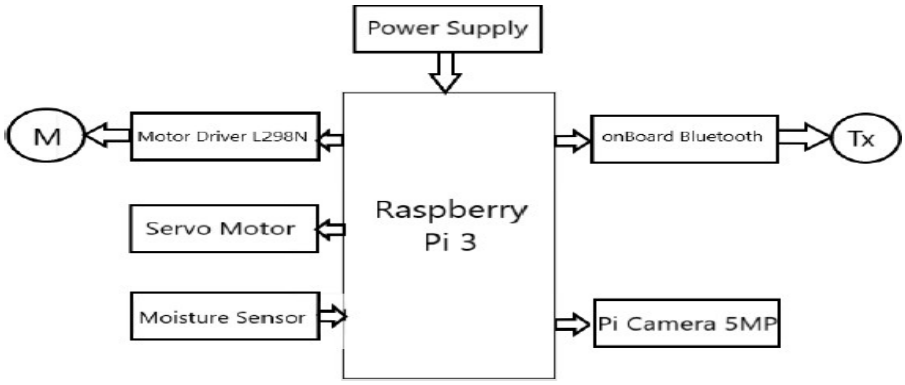
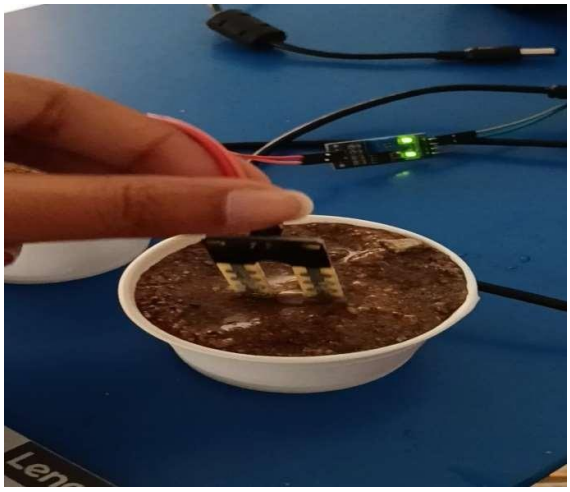
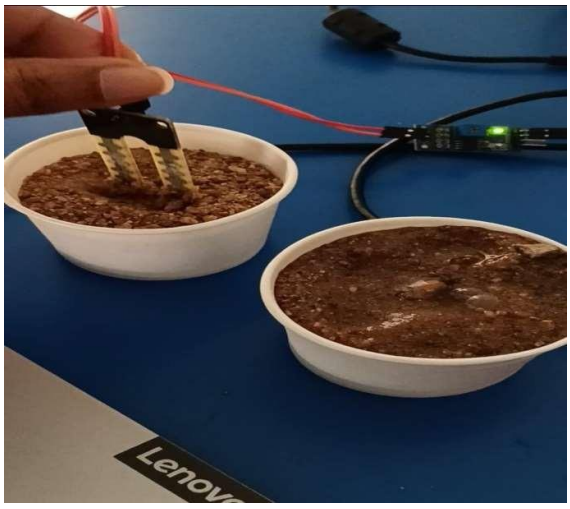


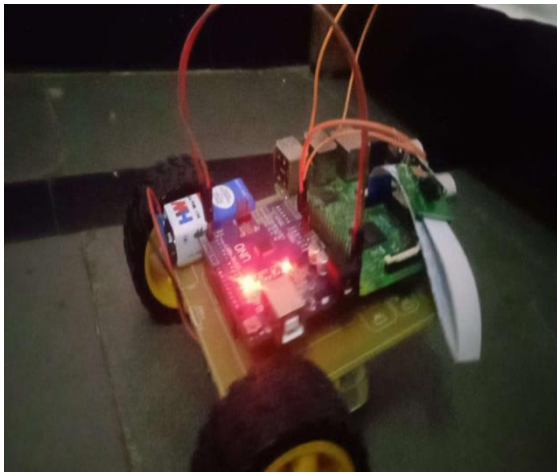
Figure 3.1: Raspberry pi interfacing with different modules

4.Result

All perceptions and exploratory tests demonstrate that this undertaking is a finished answer for field exercises and water system issues. By building up this automated vehicle with its performing multiple tasks rural highlights, it conquers the matter of ranchers in cultivating their property in each season regardless of what is the climate that day. Thinking about all the circumstances, the robot coordinated with various such modules are frequently utilized for reclamation and agrarian purposes.







5.Conclusion

The traditional farming must be induced with the robotic mechanism and is extremely much required in precision farming. There would be remote-controlled robots occupation the agricultural fields so on see the herd. Due to the introduction of agricultural robots, there would be less labor required, and a person can plan and implement the operations of the farm by himself without relying on the availability of labor.

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