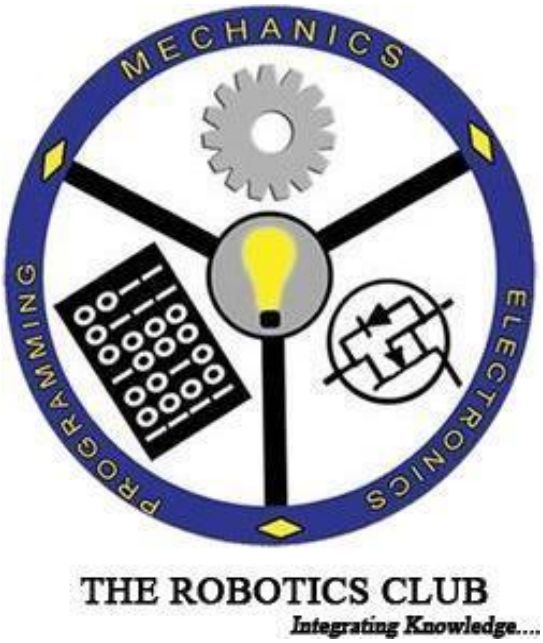
Project Report on

KEETA NAASHAKA

Submission to the THE ROBOTICS CLUB as a part of INDUCTION'22

TEAM NO-06



THE ROBOTICS CLUB-SNIST

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY

(AUTONOMOUS)

(Affiliated to JNTU University, Hyderabad)

Yamnampet, Ghatkesar, Hyderabad – 501 301.

2022

CERTIFICATE

This is the project work titled **'KETANASHAKA'** by **1. E. Manoj kumar , 2. M.V. Rohit Gupta , 3. L. Amulya, 4. Prudhvi Anand, 5. K.Ankith, 6. P. Sai sidhartha , 7. Vivek** ...under the mentorship of **'R. Sai Varun', 'Deekshith Dogiparthi'** and is a record of the project work carried out by them during the year 2021-2022 as part of **INDUCTION** under the guidance and supervision of

SAI VENKAT REDDY &
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Technical Heads

Mr. NIHAL ASJAD

The President of THE ROBOTICS CLUB

Dr . A. Purushotham

Faculty Advisor

Mechanical Department

DECLARATION

The project work reported in the present thesis titled **"KEETA NAASHAKA"** is a record work done by Team "6" in **THE ROBOTICS CLUB** as a part of **INDUCTION-2022.**

No part of the thesis is copied from books/ journals/ Internet and wherever the portion is taken, the same has been duly referred in the text. The report is based on the project work done entirely by TEAM "06" and not copied from any other source.

ACKNOWLEDGMENT

This project report is the outcome of the efforts of many people who have driven our passion to explore into implementation of **KEETA NAASHAKA.** We have received great guidance, encouragement and support from them and have learned a lot because of their willingness to share their knowledge and experience.

Primarily, we would like to express our gratitude to our mentors,‘ R. Sai Varun’, ‘DEEKSHITH DOGIPARTHI’. Their guidance has been of immense help in surmounting various hurdles along the of our goal.

We thank our technical heads **‘SAI VENKAT REDDY’** and **‘BHUVAN PRATAP AGARWAL’.** Forbeing with us till the end of the project completion.

We thank all the members of **Executive Body, Technical Advisory Board, Club's Incubation and Competence Committee** of **The Robotics Club** for helping us with crucial parts of the project. We are deeply indebted to **Mr. NIHAL ASJAD -** The President, **Mr. K. JAYANTH SIVA MADHAV-** The Vice President and **Ms. RUSHIKA REDDY–** General Secretary of **THE ROBOTICS CLUB** respectively and also every other person who spared their valuable time without any hesitation whenever we wanted.

We also thank our Faculty Advisor **Dr. A. Purushotham**, Professor, Mechanical Department, who encouraged us during this project by rendering his help when needed.

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ABSTRACT

THE ROBOTICS CLUB

INDUCTION'22 TEAM-NO – 6

THEME: Semi-Autonomous robot helps the farmers perform the heavy lifting of pesticide spraying and reduces the risk of getting any sickness due to harmful pesticides they use to grow crops.

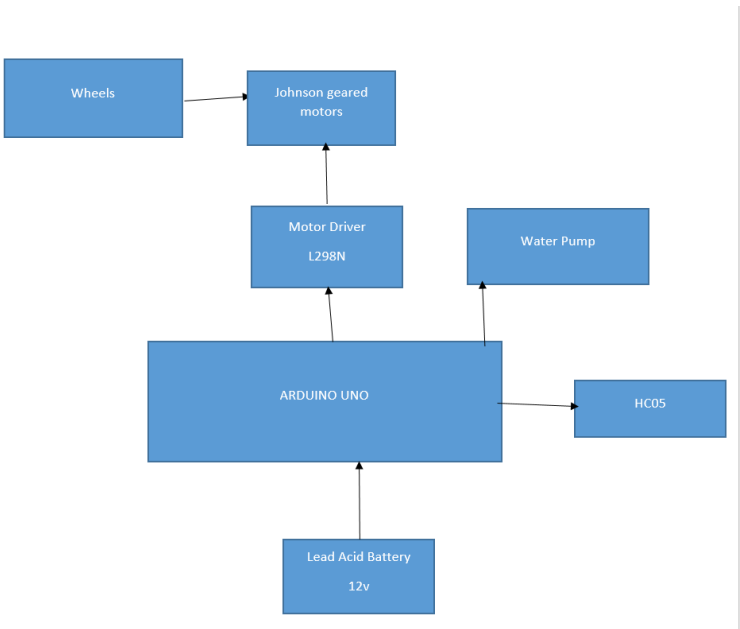
THE PROBLEM: The spraying of pesticides plays a vital role in farming. But due to chemicals present in pesticides, there are many side effects to the farmers like skin diseases and other problems while spraying. To overcome this problem declaration, we require some robot which sprays the pesticides over the plants.

THE TEAMS APPROACH TO THE PROBLEM: -

The spraying of pesticides plays a vital role in farming. But due to chemicals present in pesticides, there are many side effects to the farmers like skin diseases and other problems while spraying. To overcome this assertion, we require a robot that sprays pesticides over the plants.

BLOCK DIAGRAM: -

BLOCK DIAGRAM OF KEETA NAASHAKA



*TITLE OF THE PROJECT: - KEETA NAASHAKA

What inspired you to select the problem?

Spraying the fertilizer manually results in causing several diseases to the farmers like skin diseases respiratory problems etc., so our Approach is purely to minimize this problem caused to farmer. As farmers are every countries backbone this is just a step on serving the worthy people.

What do you feel is the most innovative part of the problem?

The innovative part which we have in our project is , our robot is controlled using an app which we have developed which sends commands to the bluetooth module which is present on the robot

IEEE FORMAT

KEETA NAASHAKA

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CHAPTER 1

Abstract- The current issue in farming begins with the usage of pesticides in agriculture which causes the farmers to have health issues due to the presence of chemicals, in addition with labour cost is more in this field of work. To reduce the risk of human illness and human labour, we are making this bot which minimalizes contact with pesticides, and it requires a single person to operate from a safe distance.

I. INTRODUCTION:

The pesticides have a vital influence of the agribusiness. The pesticides are needed for agriculture field to increase the efficiency but they are also injurious to human. In the current methods, the farmers use the back sprayer, but due to the chemicals present in the pesticides, there are many side effect to the farmers like skin diseases and other problems while spraying. Other than wellbeing concerns, semi-automated and manual spraying strategies have different downsides. Moreover, manual spraying is repetitive work, moderate, and restricted because of the absence of labourers horticulture.

i)PROBLEM STATEMENT:

The spraying of pesticides plays a vital role in farming. But due to chemicals present in pesticides, there are many side effects to the farmers like skin diseases and even inhaling air while spraying will also cause respiratory problems too. So to overcome this problem declaration, we require some robot which sprays the pesticides over the plants.

ii)INTRODUCTION TO PROJECT:

Semi-Autonomous robot helps farmers spray pesticides and is helpful to maintain farmers' health. It is controlled by a Bluetooth module so that the farmer can control the bot from a safer distance.

CHAPTER 2:

2.ARCHITECTURE:

2.1COMPONENTS REQUIRED:

2.1.1HARDWAR COMPONENTS:

1. Arduino UNO
2. Bluetooth Module
3. 12V Lead-acid Batteries
4. Wheels
5. L298n Motor Driver
6. Jumper Wires
7. L-clamps
8. 5V Relay

2.1.2 SOFTWARE LIST

1. Arduino IDE
2. Proteus
3. Fusion 360.

COMPONENTS DESCRIPTION.

2.1.1 HARDWARE.

1.ARDUINO UNO:

The Arduino UNO is a microcontroller board having the microchip The board is

ATMEGA328P. Have been arranged with sets of digital and analog input/output (I/O) pins. The **b**oard has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated
Development Environment),

Fig2: image of arduino uno

2. Hc-05 Bluetooth Module

HC-05 Bluetooth is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface either controller or PC.

Fig 2: Image of HC-05 Bluetooth Module

3. 12V Batteries

We use this for power supply to the motor. It is of 12 volts.

4. Wheels

We are using 200rpm motor, and (7cm*4cm) diameter wheels for the movement of bot. (quantity 4).

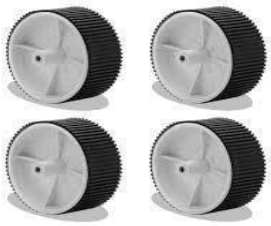

Fig 4 : image of wheels

5.L298n Motor Driver

This motor driver is used to control the rotation of the base motors and the motion of the motors of the camera module. This motor driver has mainly 16 pins. (quantity 2)
They are:
Enable pins2) − to initiate the microcontroller

VCC pins2) − power supply pins

Output pins 4) − used to get output for the motors

Input pins4) − used to get input data from the microprocessor

Ground pins4) − to ground the motors.

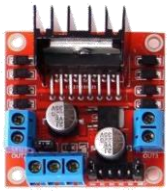

Fig 5: image of motor driver

6. Jumper Wires

Jumper wires are simply wires that have pins at both end, allowing them to be used to connect two points to each other without soldering. Jumper wires are typically used with breadboards and other prototyping So as to form it easy to vary a circuit as needed.

Fig 6: image of jumper wires.

7. L-clamps

These are used to give structural strength to the bot structure.

Fig 7: image of L-clamps

8. 5V Relay

5V Relay Module is a relay interface board, it can be controlled directly by a wide range of microcontrollers such as Arduino, AVR, PIC, ARM and so on. It uses a low-level triggered control signal (3.35VDC) to control the relay. Triggering the relay operates the normally open or normally closed contacts. It is

frequently used in an automatic control circuit

Fig 8: 5V Relay Module

2.1.2 SOFTWARE REQUIRED:

1. ARDUINO IDE

One of the software we used in programming our bot IS Arduino IDE. We used Arduino UNO microcontroller to control the motors.to program it the software used is Arduino IDE. The open source Arduino software makes it easy to write code and upload it to the board. It runs on windows, Mac OS X and Linux. It supports the languages C and C++ using special rules of source structuring. Projects made using this software are known as sketches. programming a microcontroller is somewhat different from programming a computer, there are a number of specific libraries for different boards. we have to write the code in this software based on our necessity. There are different methods and keywords so that our board understands what the action to be performed.

Syntax:

```
Void setup(){
//put your code here, to run once
}
Void loop(){
//put your main code here
}
```

Here in setup method we initialise the pins we use pinMode (pin, INPUT/OUTPUT-). In the loop we write about the action such as whether the pin to be in on or off state using digitalWrite , digitalRead , analogRead and analogWrite keywords based on the pins we use and also on the purpose we use them such as input or output . We also use delay (ms) to delay for certain milliseconds . In the loop we have to write whatever data to be collected repeatedly such as distance in case of ultrasonic sensor. It varies for different sensors based on the function to be performed by them. After writing the sketch compile it, if there are any errors rectify them, if the
code is error-free then after compilation it is ready to upload

Connect the microcontroller board into which we have to dump the code to the computer and set the port to which it is connected. Also set the board which we use here. Then upload the code and we could see that the bot performs the required action.

Fig 18 Sample image of Arduino IDE software

2 .FRITZING

Fritzing is an open-source initiative to develop amateur or hobby CAD software for the design of electronics hardware, intended to allow designers and artists to build more permanent circuits from prototypes. Fritzing can be seen as an electronic design automation (EDA) tool for non-engineers: the input metaphor is inspired by the environment of designers while the output is focused on accessible means of production. Fritzing is free software under the GPL 3.0 or later license, with the source code available on GitHub and the binaries at a monetary cost, which is allowed by the GPL.

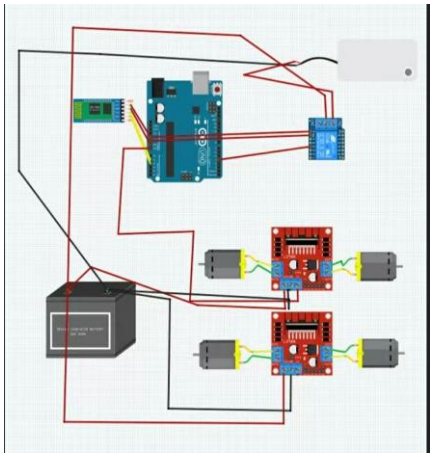

Fig 19 Sample image of proteus software

3.FUSION 360

Fusion 360 is the first 3D CAD, CAM, CAE, and PCB tool of its kind, connecting your entire product development process into one cloud-based platform used many small and big enterprises for product design and prototyping.

Fig 20 Sample image of FUSION 360 software

CHAPTER 3

3.1 BLOCK DIAGRAM

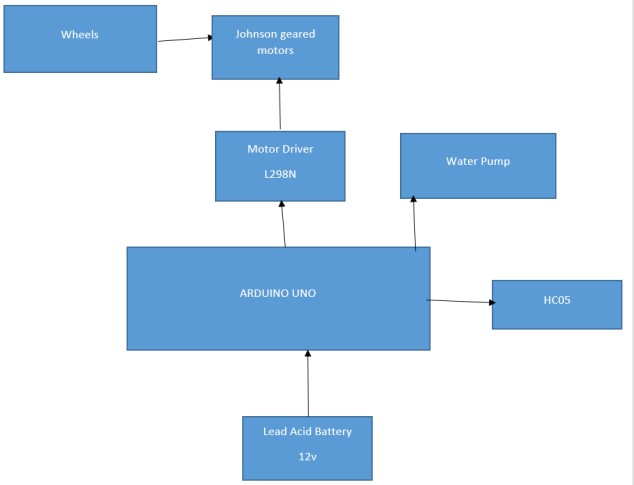

Fig 21 block diagram

3.2WORKING

As we keep in mind that we are controlling a Semi-automated Robot we need to give commands through the app linked together to a Bluetooth module. The Bluetooth module is connected to the Arduino Uno microcontroller which simulates the code given to it. First, the Arduino Uno gets the command from the app then the Arduino Uno gives the commands to the motor driver that controls the motors, Arduino Uno also controlles the Relay module

connected to the water pump, and when the command is given the relay module switches on and off the water pump. The water pump is connected to a tank in which we fill our pesticide, when the pump turns on it starts pumping the pesticide from the tank to the nozzles. Our robot works in 2 degrees of freedom (forward, backward, left, right)by this process the bot can easily maneuver in the field and do its job.

CHAPTER 4

4.EXPERIMENTAL RESULTS:

4.1RESULT

Keeta Nashaka- Our Bot helps farmers of spray pesticides on plants. Our bot can also be used to water plants. Our solution is cost effective. We believe that our bot will safeguard the farmers health from the side effect of pesticides.

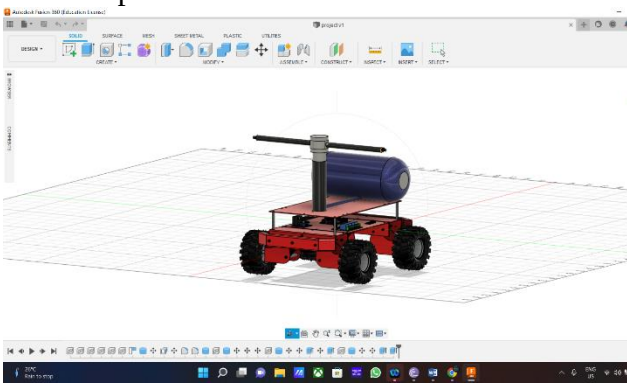

Fig: 19 CAD design of Keeta Nashaka.

4.2 FUTURE ENHANCEMENTS:

*We need to convert our bot from semi-autonomous to autonomous.

*we also want to make the bot move on its own by using image processing.
*In future we even want to make the spraying setup to be controlled using the application itself.

4.3 CONCLUSION:

Hence a semi-autonomous robot i.e. Keeta Naashaka is made. This semi-autonomous robot is controlled using Bluetooth module and is operated with an application installed in the operators mobile. Arduino and Bluetooth module plays a vital role in the successful running of the robot. Commands are sent from the users mobile to the Bluetooth module using the application, which inturn sends the commands to Arduino. Arduino in return controls the movement of the robot.
Thus this semi-autonomous robot makes the mission of spraying the pesticides easier and more than anything the health and safety of the farmer is ensured by spraying it from a safer distance.

4.4 REFERENCES:

[1] https://waypointrobotics.com/blog/elder-care-robots/

[2] https://www.automate.org/blogs/the-future-of-eldercare-is-service-robots.

[3] https://www.rohm.com/electronics-basics/sensor/pulsesensor

[4]https://www.tandfonline.com/doi/full/10.1080/17483107.2020.1773549

SOURCE CODE : 1

```
#include <Servo.h>
#include <SoftwareSerial.h>
SoftwareSerial BT(A0, A1);


int motor_r2 = 6;
int motor_r1 = 7;

int motor_l2 = 8;
int motor_l1 = 9;

int state;
int speed = 130;

int pump = 4;
int pwm = 5;

void setup(){


pinMode(motor_l1, OUTPUT);
pinMode(motor_l2, OUTPUT);
pinMode(motor_r1, OUTPUT);
pinMode(motor_r2, OUTPUT);

pinMode(pump, OUTPUT);

pinMode(pwm, OUTPUT);

// initialize serial communication at 9600 bits per second:
Serial.begin(9600);
BT.begin(9600); // Setting the baud rate of Software Serial Library

 delay(1000);
 }

void loop(){
//if some date is sent, reads it and saves in state
if(BT.available() > 0){
state = BT.read();
Serial.println(state);
if(state > 15){speed = state;}
}
```

```
   // if the state is '1' the DC motor will go forward
     if (state == 1){forword();Serial.println("Forward!");}

// if the state is '2' the motor will Backword
else if (state == 2){backword();Serial.println("Backword!");}

// if the state is '3' the motor will turn left
else if (state == 3){turnLeft();Serial.println("Turn LEFT");}

// if the state is '4' the motor will turn right
else if (state == 4){turnRight();Serial.println("Turn RIGHT");}

// if the state is '5' the motor will Stop
else if (state == 5) {stop();Serial.println("STOP!");}


else if (state == 6){Serial.println("pump on");digitalWrite(pump,
HIGH);}
else if (state == 7){Serial.println("pump off");digitalWrite(pump,
LOW);}


analogWrite(pwm, speed);
delay(30);
}


void stop(){
    digitalWrite(motor_l1, LOW);
    digitalWrite(motor_l2, LOW);
    digitalWrite(motor_r1, LOW);
    digitalWrite(motor_r2, LOW);
}

void forword(){
    digitalWrite(motor_l1, LOW);
    digitalWrite(motor_l2, HIGH);
    digitalWrite(motor_r1, HIGH);
    digitalWrite(motor_r2, LOW);
}

void backword(){
    digitalWrite(motor_l1, HIGH);
    digitalWrite(motor_l2, LOW);
    digitalWrite(motor_r1, LOW);
    digitalWrite(motor_r2, HIGH);
```

```
}


void turnRight(){
    digitalWrite(motor_l1, LOW);
    digitalWrite(motor_l2, HIGH);
    digitalWrite(motor_r1, LOW);
    digitalWrite(motor_r2, HIGH);
}

void turnLeft(){
    digitalWrite(motor_l1, HIGH);
    digitalWrite(motor_l2, LOW);
    digitalWrite(motor_r1, HIGH);
    digitalWrite(motor_r2, LOW);
}
```

RECORD OF EXPENSES :		
S.No	**Component**	**Price**
1	Wheels-4 quantity	540
2	Arduino UNO R3-1 quantity	685
3	L Clamps-4quantity	96
4	HC05-1 quantity	225
5	Relay - 4 channel -1 quantity	150
6	Bread Board-1 quantity	65
7	Johnson geared motors-4 quantity	1500
8	12v lead acid battery-1 quantity	450
9	Motor driver L298N-1 quantity	140
10	Jumpers 1set male-male	20
11	Jumpers 1 set male-female	20
12	Jumpers 1set female-female	20
13	Water Pump	70
14	Flat fan nozzles and pipes	150
15	Screws and nuts	18
	TOTAL	4141

MEMBERS	SCORE: MECH: ELE: PROG:
E.MANOJ KUMAR	
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PRUDHVI ANAND	
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REMARKS: