IMPLEMENTATION OF MULTI PURPOSE AGRIBOT

MR.A.MANIKANTH ASSOCIATE PROFESSOR, Dept. of Electronics and Communication Engg. Kallam HaranadhaReddy Institute of Technology, Guntur (A.P), India amkanth.ece@gmail.com

A.N.V.PRASANTH,B.RAKESH,A.SATHWIKA, A.USHA RANI, CH.TARUN KUMAR Student, Dept.of Electronics and Communication Engg. Kallam HaranadhaReddy Institute of Technology, Guntur (A.P), India adhikaramprasanth@gmail.com

Abstract : **Agriculture has been practiced in conventional ways for centuries and supported with mechanical systems in the last few decades. With the evolution of robotic equipment and sensors, the researchers are focusing on introducing smart farming. In this project, we propose improved algorithms for infection detection in leaves and field classification targeting a heterogeneous robotic system. Classification of the agricultural field has been done for growing different types of crops in a mixed cropping technique which has an advantage over other farming procedures. Early detection of diseases can help in better preventive measures in the early stages. Our Agribot is also contains seed sowing and water dropping systems.**

Keywords: Digital Image processing, Arduino IDE, BLYNK Console Web page

I. INTRODUCTION

Agriculture is the backbone of economic system of a specified country standard techniques of farming rely on Man power and old procedures such as the application of synthetic chemical fertilizers, pesticides, herbicides and genetically changed creatures. To carry out similar tasks with efficiency, we make use of agricultural robotics. Agribots can spot the existence of diseases, weed plants, insect infestations and other stress circumstances. Agri robots are lightweight, Agricultural robot can be controlled by an android application which is helpful for the farmers livelihood. An android application is used to monitor Agribot. This indeed supports the farmer's livelihood. Nevertheless, current methodologies that permit highly mechanised group of primary phenotypic data for compact numbers of plants in the greenhouse fall far short of the requirement to look into and distinguish plenty of plants under real world circumstances. One of the important and tedious task in agricultural practices is detection of disease on crops. It requires huge time as well as skilled labor. This paper proposes a smart and efficient technique for detection of crop disease which uses computer vision and machine learning techniques. The proposed system is able to detect 20 different diseases of 5 common plants with 93% accuracy. These structures should be precise and dependable, and should supply exceptional facts than the present routine for automated greenhouse or physical field phenotyping. This will assist us to associate plant genotypes in additional to the molecular and eco physiological responses with the interpretation of particular phenotypes in retaliation to the flourishing surroundings.

II. LITERATURE REVIEW

Minoli et al proposed most of the technological benefits provided and the logistical challenges posed by the IoT in the modern construction environment. Sivaraman et al proposed challenges are first demonstrated by the use of actual products commercially available. We then claim that, as more these apps appear, the threat vectors escalate and the data protection / surveillance of the home will become more and more difficult. We also recommend that hardware-level defenses be improved by system-level security tools that can track internet activity to prevent unusual activity. Ntuli et al proposed A Simple Security Architecture for Smart Water Management System. Computer and system stability is essential to the functioning of the application. Even though many IT security requirements have evolved over the last several years, they should not be used explicitly with the kind of restriction systems. This is because of their resource constraints and special specifications. Nevertheless, many of these methods may be modified and can be used with such parameter systems. The report suggested governance structure for smart water monitoring systems, as well as the architecture utilizes current security technologies and

ISSN: 2278-4632
Vol-13, Issue-04, March 2023

layout trends. Suma et al proposed a wide range of technologies such as Bluetoothbased network connectivity, humidity & weather sensing, scarring trespassers, protection, leaves wetness and adequate agricultural equipment. This allows constant use of cellular sensor networks to determine surface resources and external factors. Verdouw et al proposed centers on detecting and tracking, whereas operation and remote control are far less discussed.

III. PROPOSED SYSTEM

The proposed Agribot is used to cultivate along with seed sowing with water dropping system and also it detects the plant disease using Matlab. Whole system is driven by NodeMCU. First, the images of various leaves are acquired using a digital camera. It follows the process mentioned in block diagram. This robot includes the seed sowing mechanism and water system controlled by NodeMCU. Power supply given by two set of batteries each of 9V,1Amp connected in series.

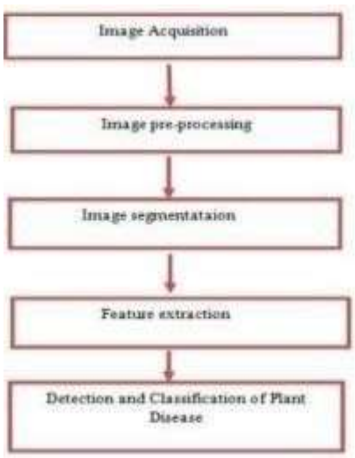

Fig- 1 PROPOSED SYESTEM PROCESS

IV. FLOW CHART

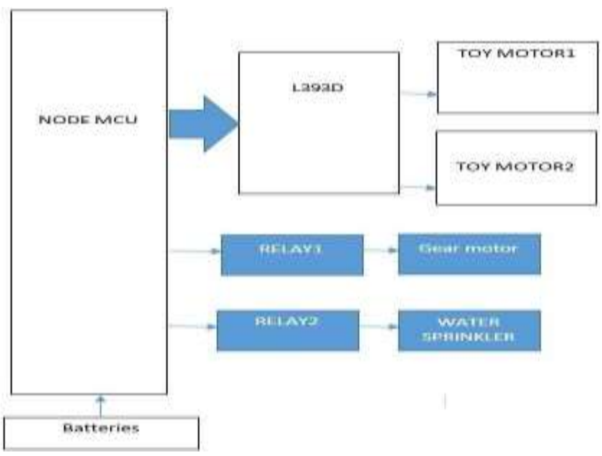

Fig- 2 FLOW CHART

- NODE CU module is used as main heart of this project
- IOT communication is used to control the robo directions along with pump motor and seeds machine prototype
- Toy motors are used for moving of robot
- MATLAB part is sued here to find leaf diseases

V. HARDWARE REQUIREMENTS

A. L7805CV-REGULATOR: The L7805CV is a TO220 three-pin linear regulator based on the commonly found 7805 that has a maximum input voltage of 35 V, a maximum output current of 1.5 A, and a fixed output voltage of 5 V. In our project it is used to convert the 9V input voltage to 5V.

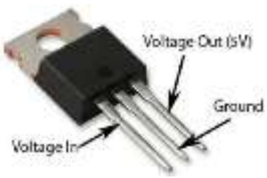

Fig- 3 L2805CV- REGULATOR

B. L293D-MOTOR DRIVER: The motor driver is used to driven the DC motor which are connected to the wheels. It is a current amplifier, that controls the power given to the motor and it also turns low current signal into the high current signal to drive the motor and vice versa .

Fig- 4 L293D-MOTOR DRIVER

C. DC MOTOR: Many of us could have come across this Hobby DC motors through kids toys such as remote controlled cars, trains etc, hence this motor is also called as Toy motor. Nevertheless this motor can also be used for many other common purposes and is mostly used by beginner level electronics hobbyist.

Fig- 5 DC MOTOR

D. CHASSIS BOARD: This Chassis board is widely used as a mechanical frame structure of mobile robots. It is the backbone of the robot, where we arrange and connect everything like motors, sensors, and wheels. It gives you the base to build our robot and allows you to place your components according to requirements.

Fig- 6 CHASSIS BOARD

E. NODEMCU

NodeMCU is a low-cost open source IoT platform. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which was based on the ESP-12 module. Later, support for the ESP32 32-bit MCU was added.

In this project NodeMCU is used to operate the robot. Digital I/O pins are used to connect the relays and also used to control the Seed sowing and watering systems.

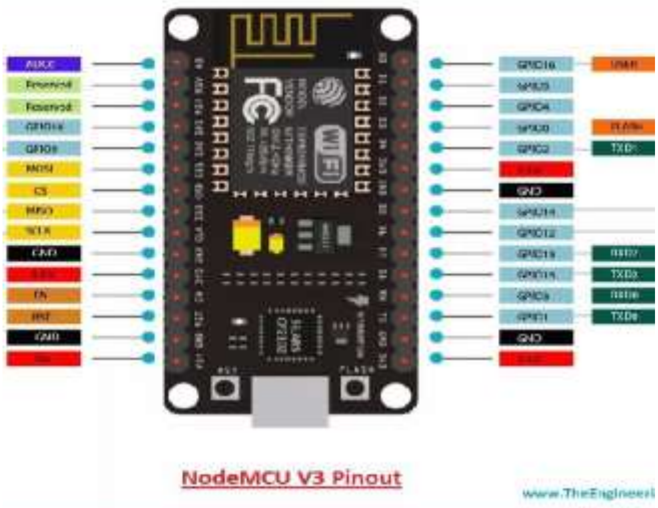

Fig- 7 NODEMCU

VI. SOFTWARE REQUIREMENTS

A. MATLAB

- MATLAB is a proprietary multi-paradigm programming language and numeric computing environment developed by MathWorks. MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages.

- MATLAB is a programming platform designed specifically for engineers and scientists to analyze and design systems and products that transform our world. The heart of MATLAB is the MATLAB language, a matrix-based language allowing the most natural expression of computational mathematics.

Fig- 8 MATLAB

ISSN: 2278-4632
Vol-13, Issue-04, March 2023

B. ARDUINO IDE

- The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such as Windows, Mac OS X, and Linux. It supports the programming languages C and C++. Here, IDE stands for Integrated Development Environment.
- The program or code written in the Arduino IDE is often called as sketching. We need to connect the Genuino and Arduino board with the IDE to upload the sketch written in the Arduino IDE software. The sketch is saved with the extension '.ino.'

Fig- 9 ARDUINO IDE SOFTWARE

C. BLYNK.CONSOLE-WEB PAGE

- Everything you need to build and manage connected hardware: device provisioning, sensor data visualization, remote control with mobile and web applications, Over-The-Air firmware updates, secure cloud, data analytics, user and access management, alerts, automations and much more…
- Blynk platform powers low-batch manufacturers of smart home products, complex HVAC systems, agricultural equipment, and everyone in between. These companies build branded apps with no code and get the full back-end IoT infrastructure through one subscription.

Fig- 10 BLYNK.CONSOLE-WEB PAGE

D. DIGITAL IMAGE PROCESSING

- Digital image processing deals with manipulation of digital images through a digital computer. It is a subfield of signals and systems but focus particularly on images. DIP focuses on developing a computer system that is able to perform processing on an image. The input of that system is a digital image and the system process that image using efficient algorithms, and gives an image as an output. The most common example is Adobe Photoshop. It is one of the widely used application for processing digital images.
- Image processing mainly include the following steps:

  1.Importing the image via image acquisition tools;

  2.Analysing and manipulating the image using MATLAB.

  3.Output in which result can be altered image or a report which is based on analyzing that image.

E. INTERNET OF THINGS

- The term IoT, or Internet of Things, refers to the collective network of connected devices and the technology that facilitates communication between devices and the cloud, as well as between the devices themselves.
- Several industries use IoT, such as resource optimization through sensors in the manufacturing industry, real-time and water resource monitoring in the agriculture industry,

and IoT appliances in the Healthcare industry. It is crucial to set security standards to control the adverse effects of IoT uses.

- IoT applications run on IoT devices and can be created to be specific to almost every industry and vertical, including healthcare, industrial automation, smart homes and buildings, automotive, and wearable technology. Increasingly, IoT applications are using AI and machine learning to add intelligence to devices.

V. RESULT

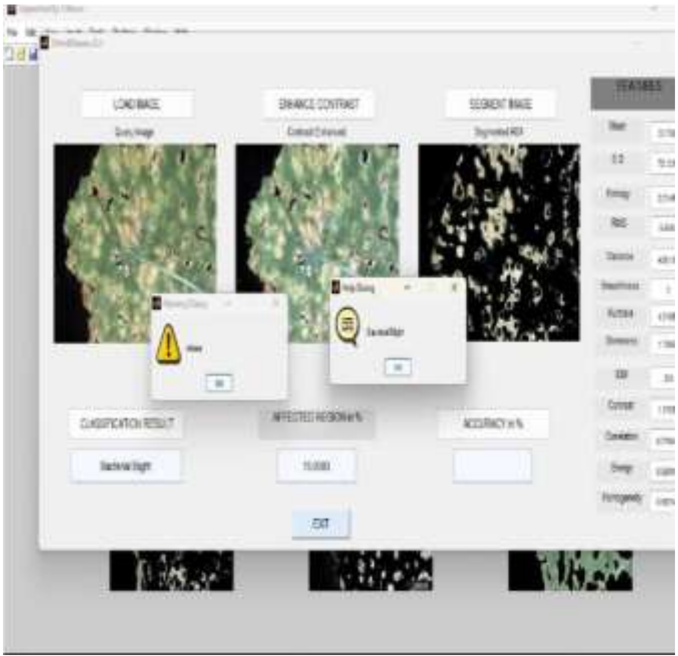

Fig- 11 PLANT DISEASE DETECTION

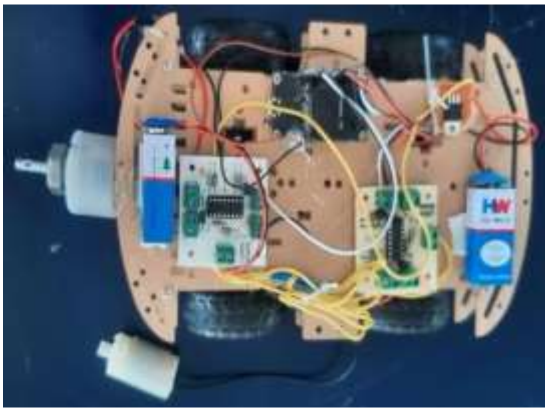

Fig- 12 AGRIBOT

VI. APPLICATION

We have developed an agricultural robot (AgriBot) which is capable of performing all the agricultural task such as seed sowing, harvesting, irrigation, soil digging, fertilizer spraying, and many more.

VII. FUTURE SCOPE

More number of sensors can be integrated to proposed robo to increase efficiency and camera also can be attached to see live video.

VIII. CONCLUSIONS

(i) In conclusion, the proposed system for live location tracking of women in emergencies is an innovative solution that uses the latest GPS and GSM technologies to locate women in real-time, even when their mobile phones are turned off or not available. The use of the SIM800L GSM module and the Arduino UNO provides an accurate and reliable way to process SMS commands and retrieve location coordinates from the NEO 6M GPS module.

(ii) The system can be easily deployed in any location and can be used by emergency services to locate women in need. Overall, this system has the potential to make a significant impact on women's safety, especially in developing countries where violence against women is prevalent. Further improvements to the system, such as incorporating additional features like an alarm system or panic button, can be explored in the future to enhance its functionality and effectiveness

IX. ACKNOWLEDGEMENT

We would like to express our sincere gratitude to MR.A.Manikanth Sir, who was our project supervisor for providing us with guidance and valuable insights throughout the project. We would also like to acknowledge the support of our friends, and faculty who contributed their time and effort in helping us with the project. Additionally, we would like to thank the Components providers. Finally, we are grateful to the IEEE community

ISSN: 2278-4632
Vol-13, Issue-04, March 2023

for providing us with a platform to share our research and contribute to the field of Farming.

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ISSN: 2278-4632
Vol-13, Issue-04, March 2023