

# Agribot-Multipurpose Farm Machinery Robot

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**Abstract-** Agriculture has been chosen as the primary occupation by more than 42% of the total population in the world. It can also be seen that agriculture is called as the ‘Backbone of India’, since more than 70% of Indian population depends on agriculture. Agriculture is the process of cultivation of plants for producing food, fiber and other desired products. The main aim of Agribot is to apply robotics technologies on the field of agriculture. According to recent studies it has been found that farmers still follow traditional methods to carryout agricultural activities because of which labor force is increased and accuracy of the final outcome is decreased. Due to lack of knowledge sometimes farmer fail to identify the disease of the leaf. This project aims to solve agriculture related issues and increase accuracy of the final outcome by developing an agriculture robot which does agricultural tasks automatically such as digging, levelling, seeding, irrigation along with detection of leaf disease and indicating farmer with suitable pesticide.

**Keywords-** Digging, Levelling, Seeding, Sprinkling the Pesticides, Detection of Leaf Disease.

## I. INTRODUCTION

Agriculture is the process of cultivation of plants for producing food, fiber and other desired products. Agriculture has been chosen as the primary occupation by more than 42% of the total population in the world. Since more than 70% of Indian population depends on agriculture, it is called as the ‘Backbone of India’.

According to recent studies it has been found that farmers still follow traditional methods to carryout agricultural activities because of which labor force is increased and accuracy of the final outcome is decreased. This project aims to solve agriculture related issues and increase accuracy of the final outcome by developing an agricultural robot which does agricultural tasks automatically such as digging, leveling, seeding and irrigation along with detection of leaf disease and indicating the farmer with suitable pesticide. In olden days’ technology was not developed that much. So, they were seeding by hand. But nowadays technology is developed. So now it’s not necessary to do seeding in sunlight. By using robot technology, one can sit in a cool place and can-do

seeding by monitoring the robot motion. In recent years, robotics in agriculture sector with its implementation based on precision agriculture concept is the newly emerging technology.

Robotic is included in this system a field robot goes through the field and captures the images of the leaves and processing of the image is done using the processor that is integrated in it. After the evaluation of the diseases the result is sent to the farmer/owner of the field in the form of SMS. The steps involved in disease detection are Digital image acquisition, Image pre-processing (noise removal, Color transformation, and histogram equalization), K-means Segmentation, Feature extraction, and classification using the support vector machine algorithm which is a supervised learning algorithm.

## II. STUDY FOCUSES

The following points are the study focuses on which problem occur:

1. Solve agricultural related issues and increase accuracy of final outcome.
2. The farmers to just supervise the robots without the need to operate them.

## III. IMPORTANCE OF THE STUDY

The importance of the study is:

1. The Agribot is to apply robotic technologies in the field of agriculture.
2. Robots which perform the operations manually as well as automatically are very useful to the farmers.
3. To reduce the farmers work load as well as increase the speed of work along with increase in yield of agriculture.

## IV. RELATEDWORKS

The system consists of various stages including collection of images of agricultural leaves for creation of database. Image segmentation is performed using clustering techniques. Features of segmented images are stored in

database with respective image of agricultural leaves. Using support vector machine classifier, we would be finding out type of disease presents in image and give remedies to control it. Further it consists of automated modules which accomplish the following functions:

Abirami Devaraj, Karunya Rathan, Sarvepalli Jaahnavi and K-Indira [2] describes Agriculture is a backbone of our country. Agriculture has become far more than simply a method to feed ever growing populations. The foremost necessary consider less amount of crop quality because of disease.

Devi Kala Rathinam. D, Surendran, Shilpa. A, Shrein [3] describes the wireless sensor networks help the farmer to change the traditional agriculture to modern agriculture. WSN helps the farmers in different aspects. In WSN micro sensors are used and global positioning system is used in sensors to find the exact location. Sensor network are very cheap, and can be used even in rural areas. Different types of sensors used in agriculture like temperature, smart phones.

Jasmeet Kaur, Er. Ramanpreet Kaur [4] describes the plants have become an important source of energy, and are a fundamental piece in puzzle to solve the problem of global warming. SVM algorithms are able detect diseases in plant in an accurate way. Image processing is a procedure to change over an image into digital shape and play out a few operations to get an enhanced image and concentrate valuable information from it. It is most recent innovations and its applications in different parts of a business.

Prof. C. H. Chavan, Mr. P.V. Karande [1] describes the Wireless technology using various sensors for precision agriculture has become a popular research with the greenhouse effect.

## V. COMPONENTS REQUIRED

### Software Used:

1. PYTHON
2. Cloud Computing
3. MATLAB

## VI. EXISTINGSYSTEM

Initially farmers were required to be present on the field. Earlier was not cheap and affordable. It was prone to hazardous chemicals like pesticides. Data are not collected frequently from the crops because frequent collection does not provide any useful information. In the manual system, sensors were not used for moisture, humidity level and send the data

through the network. In India generally the traditional seed sowing methods includes the use of animal drawn funnel and pipes driller or drilling using tractor. Earlier method requires labor and a very time and energy consuming.

## VII. PROPOSED SYSTEM

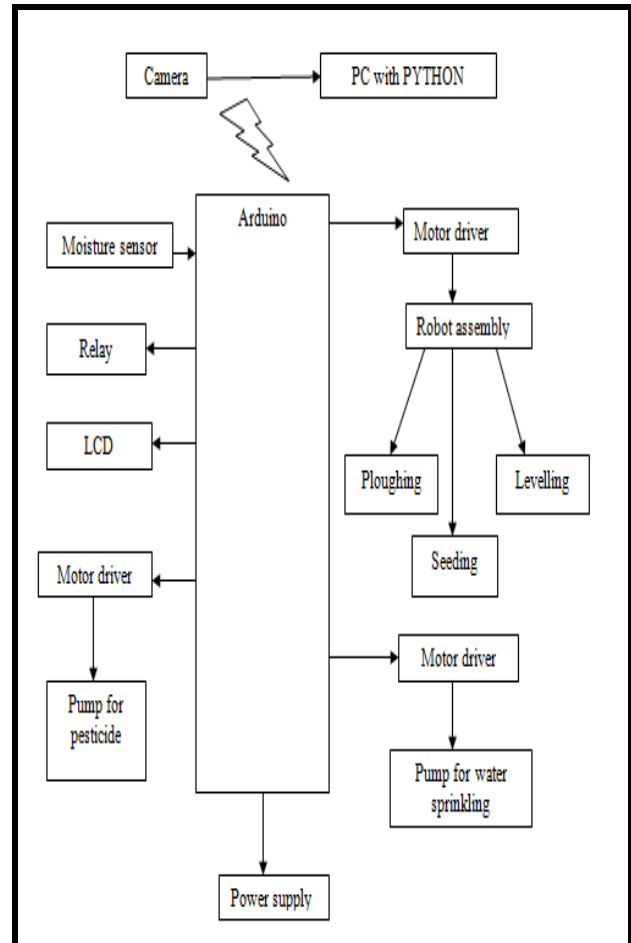


Fig 1:Components of Agribot

The proposed system consists of various stages including collection of images of agricultural leaves for creation of database. Image segmentation is performed using clustering techniques. Features of segmented images are stored in database with respective image of agricultural leaves. Using support vector machine classifier, we would be finding out type of disease presents in image and give remedies to control it. Further it consists of automated modules which accomplish the following functions are Automated seeding, Automated digging, Automated irrigation considering moisture level, Automated levelling, Automated pesticide sprinkling. Advantages like Time and manual power is reduced, used in various fields like agriculture, medicine, mining, and space research, the machines could easily work around trees, rocks, ponds and other obstacles and the robot will be able to expose in different weather conditions.

**VIII. OBJECTIVES**

The objectives of this study are as follows:

- Solve agricultural related issues.
- To reduce the farmers work load
- The farmers to just supervise the robots without the need to operate them.

**IX. RESULTS**

**1. Normal Leaf**



Fig 2: Normal Leaf

**2. Rust Disease in a Leaf**

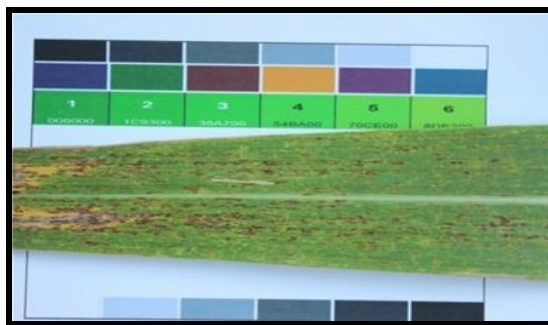


Fig 3: Rust Disease in a Leaf

**3. Result of Image Pre-processing**

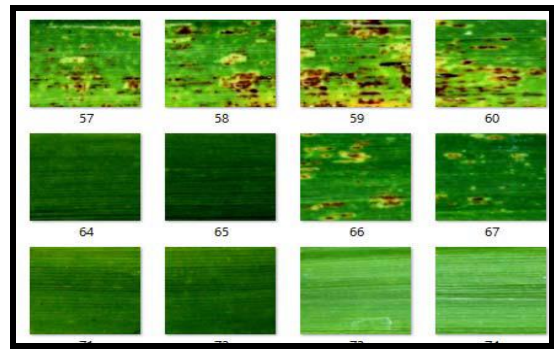


Fig 4: Result of Image Pre-processing

**4. Agribot Working Model**

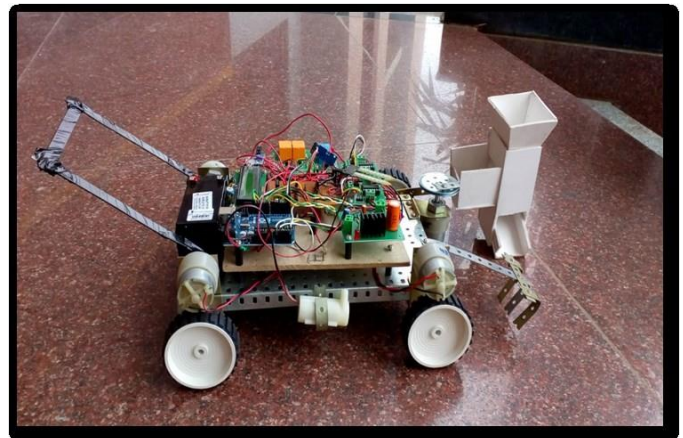


Fig 5: Agribot Working Model

**5. Identification of Plant Healthy**



Fig 6: Identification of Plant Healthy

**6. Identification of Plant Unhealthy**



Fig 7: Identification of Plant Unhealthy

## X. CONCLUSION

Multipurpose autonomous agricultural robot has successfully implemented and tested for various functions like ploughing, seeding, leveling and water spraying. Application of inexpensive navigation sensors to the robot farming system makes the system economically adaptable with the environment. With the development of robot farming system, food production can be increased considerably and economically. Initially the farmers send a digital image of the diseased leaf of a plant and these images are read in MATLAB and processed automatically based on SVM algorithm. The results of this project are to find appropriate features that can identify leaf disease of certain commonly caused disease to plants. Based on the classified type of disease a text message was sent to the user. With fully-automated farms in the future, robots can perform all the tasks like moving, fertilizing, monitoring of pests and diseases, harvesting, tilling, etc.

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