Plant Health Detection Using Image Processing With Robot

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Abstract: In India farmer face lot of challenges in year. Farmer use pest infestation in crop because of this which increases the large losses & this affect on his lifestyle. Agricultural and Horticulture is one of our most parts in our life because it provide food, feed and fuel necessary for our survival. In that farmer robots are playing a very important role in the field of agriculture for farming process automatically. Normally, farmers do basic process which include plowing, planting, irrigation, fertilisation, monitoring and harvesting of a crop. All processes are being done by farmer but it require more energy and time. To avoid this by using robot for monitoring the field parameter and also for the spraying pesticide on plant if required. The proposed system prototype is implementing by selecting an area which considering the agricultural field of any kind of polyhouse crop.

Keywords: Robot; plant health; horticulture; controlling; detection;

I. INTRODUCTION

In India the ever-growing population comes the problem of food shortage. And the food production is not sufficient large, so to increases food production we have to use automatic and fast process system. One available way is there to increase food production is to integrate the new technologies such as intelligent farming robots, image processing, sensing devices, etc.

Agriculture has been one of the primary beruf of man since early an organize culture encompassing many communities and even today manual interventions in farming are impossible. In agriculture the greenhouses is important part and gardening sectors in our country as they can be used to grow plants under controlled environmental conditions for optimum produce.

II. SYSTEM BLOCK DIAGRAM

In this project we are going to discuss about the farming robot which is use to designing the plant health detection automatically using Farming Robot camera which will sense the environmental parameter in real time condition. In that we are discus about the parameter which use in this system. i.e study on block diagram

1) Supply Requirement:

   In any electronic system the design of power supply is basic essential part and most important because without this we can't do anything. Power supply is energy for the circuitry for doing the operation. There is different type of power supply design. But on the requirement it
may be fix or variable in our project it is fix for both controlling section and farming robot, also supply require for output devices like fan, light, motor, etc.

2) Zig-bee Module:
It is high level communication and IEEE 802.15.14 standard, it create the personal area network for small and low power communication. Zig bee module use to received data from the sensor i.e simple structure while Bluetooth and wifi are use for large and complex structure.

![X Bee /X Bee-PRO ZB RF Modules](image1)

3) Infrared sensor:
The principle of an infrared operation is based on infrared light that reflected when hitting an obstacle. An IR receiver received the reflected light and the voltage are created measured based on the amount of light receive. In this project the IR sensor are use to trace the black line.

![IR sensor](image2)

4) LM35
This is the temperature sensor use to measure the temperature and create voltage accordingly and display the current temperature.

5) Humidity Sensor Module (SY-HS 220)
It is use to measure the humidity from the environment.

![Humidity Sensor Module](image3)

6) Soil Moisture Detection Module
This is the simple type of soil moisture sensor. Which detect the moisture in the soil and create the voltage and measure it in the form of moisture in the soil.

7) Light Sensor:
Light sensor are use to detect the light and create the resistance and this resistance give the voltage drop and this voltage drop is measure in the form of light intensity.

8) Camera (RG-CAM-1)
Camera is device for capture the image of object. Here it capture the image of leaf of plant for disease detection purpose.

9) ARM 7 Controller
ARM 7 is controller of farming robot and it take the decision according to the input signal.

10) Microcontroller:
This controller use in controlling section. For to turn ON the light and fan if required.

III. IMAGE PROCESSING
In this project main part is to detect the disease on the plant and spray the pesticide on that require plant only. Here we use thresholding method to detect the disease of leaf of plant. In thresholding method it convert the image into gray level and then binary two state are there One and zero. In the matlab there is tool for image processing all color space transformation.

IV. COMPARISION BETWEEN MAN AND FARMING ROBOT

<table>
<thead>
<tr>
<th>Sr. no.</th>
<th>Parameter</th>
<th>Manual</th>
<th>Farming Robot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Man power</td>
<td>Large</td>
<td>Less</td>
</tr>
<tr>
<td>2.</td>
<td>Time Requirement</td>
<td>More</td>
<td>Less</td>
</tr>
<tr>
<td>3.</td>
<td>Spraying Technique</td>
<td>Manually</td>
<td>Automatic</td>
</tr>
<tr>
<td>4.</td>
<td>Wastage of pesticide</td>
<td>Large</td>
<td>Less</td>
</tr>
</tbody>
</table>

CONCLUSION
In the agriculture and horticulture sector there is a requirement of time, power and water management. Basis on this main important point we design the robot which will help in this point. Also for the farmer safety point of view it is perfect. By using this system we can manage the time; also save the water and pesticide using sensing unit and image processing technique.
REFERENCES


