Locust Monitoring System Based on Using Iot

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Abstract:- Growth in technological world in past years has brought drastic changes in human world. There is no field without advanced technology. This smart technology is also used in agriculture which is termed as Smart Agriculture. It has given many impactful solutions for all the problems. In this project, we have proposed a solution for the locust problem which is threatening the framers. Here we use image processing, in which it gets the data we feed and analysis the field. In this process if the system detects a swarm it alerts the user and automatically sprays the fungus called "Metarhizium acridum" which feed only on locust and relative insects to destroy it.

Keyword:- Image Processing, Locusts, Fungus, Smart Agriculture.

I. INTRODUCTION

Agriculture is the major occupation all over the world. Many people's life depends on this field. Agriculture not only provides food, it also provides textile related raw materials, products for animal farms and so on. This agriculture process requires so much care and techniques to progress. But due to natural conditions and changes in environment more problem arises and threatens farmers. To solve these problems in an efficient and smart way smart agriculture was brought into action to save time and manual work. Each day a new technology is implemented to solve the obstacles in agriculture which can be solved using technologies. Smart agriculture helps framers with accuracy in information and also it is reliable and flexible with changes.

Locust swarm is a threaten to farmers as they destroy all the crops by feeding on them. So considering this as a problem statement we came up with a solution which is to detect and destroy the locust in an efficient way. Here we use a camera to monitor the field and alert the user if it detects the locust using image processing and ON's the motor automatically to spray the fungus to kill the locust. This fungus feeds only on locust and its types so it won't destroy the crops. Also, this result is uploaded in the cloud so authorized people can view and get alerted. MATLAB and IOT plays an important role in this system. We choose this method because it is one of the affordable and efficient solution. It will simple and understandable for the farmers or any one to follow. The accuracy of the system is reliable.

In this paper, section II contains review of literature section III contains problem statement and preliminaries. Section IV contains program analysis and implementing problem. Section V contains advantage. Section VI contains results and Section VII contains conclusion.

➤ *Objectives of the Study:*
The main objective of this project is to help framers by detecting the locust swarm that affect the crops and destroy it.

II. REVIEW OF LITERATURE

1. "SMART FARMING USING IOT",
Amandeep, Arshia Bhattacharjee, Paboni Das, Debjit Basu, 2017, IEEE.[6] Even today, different developing countries are also using traditional methods and backward techniques in agriculture sector. Little or very less technological advancement is found here that has increased the production efficiency significantly. To increase the productivity, a novel design approach is presented in this paper. Smart farming with the help of Internet of Things (IOT) has been designed. A remote-controlled vehicle operates on both automatic and manual modes, for various agriculture operations like spraying, cutting, weeding etc. The controller keeps monitoring the temperature, humidity, soil condition and accordingly supplies water to the field.[6]

2. "INTERNET OF THINGS APPLICATION FOR IMPLEMENTATION OF SMART AGRICULTURE SYSTEM"
K.Lokesh Krishna, Omayo Silver, Wasswa Fahad Malende, 2017, IEEE.[3] Over the past few years, there has been significant interest in designing smart agricultural systems. The use of smart farming techniques can enhance the crop yield, while simultaneously generating more output from the same amount of input. But still, most of the farmers are unaware of the latest technologies and practices. In this paper a novel wireless mobile robot based on Internet of Things (IoT) is designed and implemented for performing various operations on the field. This proposed wireless robot is equipped with various sensors for measuring different environmental parameters. It also includes Raspberry Pi 2 model B hardware for executing the whole process. The main features of this novel intelligent wireless robot are that it can execute tasks such as moisture sensing, scaring birds and animals, spraying pesticides, moving forward or backward and switching ON/OFF electric motor. The robot is fitted with a wireless camera to monitor the activities in real time. The proposed wireless mobile robot has been

tested in the fields, readings have been monitored and satisfactory results have been observed, which indicate that this system is very much useful for smart agricultural systems.[3]

III. PROBLEM STATEMENT AND PRELIMINERIES:

Due to global warming more problem arises. Agriculture is one of the fields which gets affected by its changes. Currently one of the problems that framers face is dessert locust swarms. It destroys all paddy fields and it is difficult for farmers to control or destroy it. There are some solutions which is used for this problem, all of those methods are mostly based on geographical information. It's a complicated process, sometimes it is not accurate or not easy to follow.

So, this project proposes a solution, which detects the locust using image processing with MATLAB programming, this process the image stored and the current image of field by the algorithms with KAZE. This converts image from colour to grey shade and match the similarities and compare and take decision. If the match is 100% accurate it alerts the user and destroys it by spraying fungus automatically when it gets an alert signal from the system.
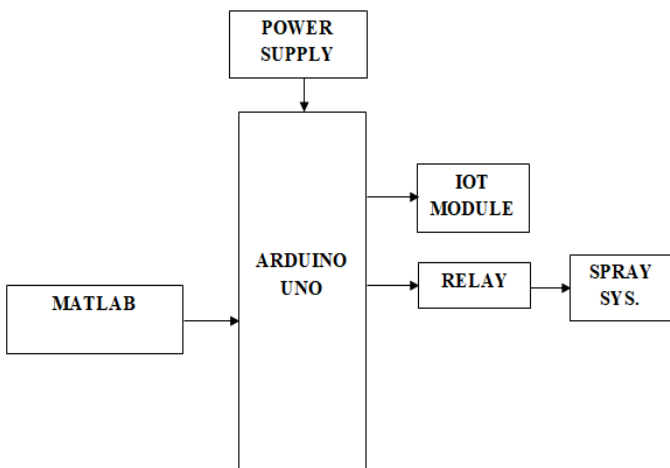

FIG1. BLOCK DIAGRAM

IV. PROGRAM ANALYSIS FOR IMPLEMENTATION PROGRAM:

Here we use ARDUINO UNO with software like ARDUINO IDE, embedded C and MATLAB program to implement the process to detect the locust swarm with image processing and pump motor to spray the fungus.

FIG2. ARDUINO UNO BOARD

Relay is used for controlling switch of the pump motor og the system.

FIG3.RELAY

FIG4. PUMP MOTOR

Pump motor is used for the fungus spraying. We use a IOT module to upload the details in the cloud. MATLAB program and embedded C program for UNO is used to operate, we is IDE which is an open source for ARDIUNO. KAZE algorithm is infused for the extraction of images to find the presence of locust.
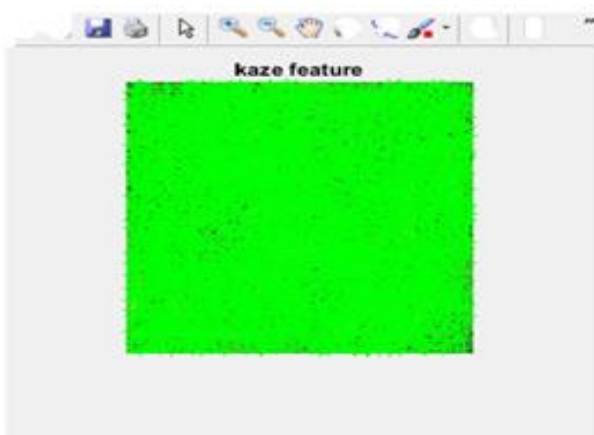
FIG5.gray converted image

FIG6.kaze feature

V. RESULT OF THE STUDY

The result of this study is that it destroys the locusts using the fungus when it detects it by digital image processing technique with the help of Arduino and MATLAB program.

VI. ADVANTAGES

The main advantage of this proposed system is that it is efficient and simple method to follow unlike the other solutions. This process controls the locust from destroying the crops in the field without any damage to it.

VII. CONCLUSION

The main purpose of the project is to help farmers to protect their crops from locust and destroy them. With reference to existing systems, considering their disadvantages we have proposed a solution which is effective and simple. In this we detect the locust using image processing method and destroy by spraying "Metarhizium acridum" fungus.

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