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Automated Insect Control Using Swarm Robot

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ABSTRACT: Insects are one in every of the foremost problem in economic crops. The manual identification and detection of insects are labor inefficient and intensive factors can influence recognition accuracy. To handle these shortcomings, an insect monitoring robot and a replacement method to acknowledge the plants with insects are presented during this solution. First step, the robot gets images by a difficult performance, fast action and detects whether there are insects within the pictures. This might otherwise be done by saving pest affected plant image as reference dataset different images are stored for effective recognition. If a plant seems to be matching with the saved dataset then the plant are often classified as an affected plant. To remain with the popularity results, the speed of the robot car and mechanical pesticide sprayer are often adjusted adaptively.

I. INTRODUCTION

The aim of the project is to design an Agriculture swarm robot for spraying pesticides, in order to reduce the manpower and reduce health issue. This project will enable the farmers to use the latest technology in the field of agriculture. Agriculture is the science and art of cultivation on soil to increase the human livestock. Agriculture is one of the major fields which help in the growth of our economy. Agriculture plays a key role in the food production process all over the world. In modern technology, Plant breeding, Agrochemicals, Pesticides and Fertilizers have been developed and utilized to increase the yields from cultivation, ecological and environmental damage. The major products of agriculture are grouped into food, fuel, fibers and raw material, In that the classes of food may contain cereals, vegetables, fruits, oils, meat, milk, fungi and egg. The main occupation of India is Agriculture. Agriculture increases the working population of our country. The purpose of ploughing is to turn over the upper layer of the soil; bringing fresh nutrients to Ploughing and cultivating soil homogenies and modify the upper 12 to 25 centimeters (5 to 10 in) of the soil to form a plough layer. In many types of soil, most of the fine plant feeder roots can be found in the topsoil or plough layer. Pesticides are used to control various types of pests and disease carriers such as mosquitoes, ticks, rats and mice. Pesticides are used in agriculture too control weeds, insect infestation and diseases of plants. Swarm robotics is an approach to the coordination of multiple robots as a system which consists of large numbers of mostly simple physical robots.

II. LITERATURE SURVEY

The disease detection is important in agriculture for an efficient crop field. The leaf disease like bacterial spot, late light, sectorial leaf spot and yellow curved leaf disease affect the crop quality of tomatoes. Automatic methods for classification of plant disease also help taking action after detecting the symptoms of leaf diseases.
This paper presents Convolutional Neural Network (CNN) model and Learning Vector Quantization (LVQ) algorithm based method for tomato leaf disease detection and classification. here this paper, image processing techniques are used to detect the plant leaf diseases, objective of this work is to implement image analysis & classification techniques for detection of leaf diseases and classification. The proposed framework consists of four parts.

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They are (1) Image pre-processing (2) Segmentation of the leaf using K-means clustering to determine the diseased areas (3) feature extraction & (4) Classification of diseases. Texture features are extracted using statistical Grey-Level Co-Occurrence Matrix (GLCM) features and classification is done using Support Vector Machine (SVM).

For agricultural production an innovative technology used in the farming system which helps to improve quality and quantity of the product. Since tomato plant farming take considerations from variables such as environment, soil, and amount of sunlight, existence of diseases cannot be avoided.

In existing system the farmers are spraying in agriculture field with the help of spray bag. The spray bag contains the mixture of water and pesticides. The farmers spend more time to spraying pesticides in agriculture field and they caused by more disease like skin disease, respiratory problem and blind issues. Time is very important parameter in life. In existing system, time taken for spraying pesticides in agricultural field is high compare to proposed system. The area coverage is one of the parameter for evaluating limitations of spraying pesticides by human. The area coverage and time are directly proportional to each other. For large area, time taken for spraying pesticides in agriculture field is more whereas for small area, time taken for spraying pesticides in agricultural field is less.

In this existing system the area coverage is small compared to proposed system. The important drawback in existing system is disease. In existing system, body of the farmer is directly contact with the pesticides liquid so it will cause many harmful diseases to the farmers.

III. PROPOSED SYSTEM

Recent advance in computer vision made possible by deep learning has paved the way for camera- assisted disease diagnosis for tomato. The study developed the innovative solution that provides efficient disease detection in tomato plants.

Agriculture also provides main support for transport sectors such as railways and roadways. Agricultural produce is transported from farms to the mantis and factories. Internal trade is carried out mostly with agricultural products. The Finance of government depends upon the agriculture sector.

Agriculture has been the foundation of raw materials to the primary industries like cotton and jute textiles, sugar, tobacco, fruits and vegetables, dhal milling, rice husking, making etc. depends on agriculture directly for their raw materials. These are the sources provided in our proposed system. In our system a mobile robot is designed for pest detection and controlling. Here recognition is done using camera. Captured image is compared with saved dataset. If pest is detected then robot will stop and adjust the sprayer to effectively apply pesticide. Raspberry pi is used for image processing and robot control.

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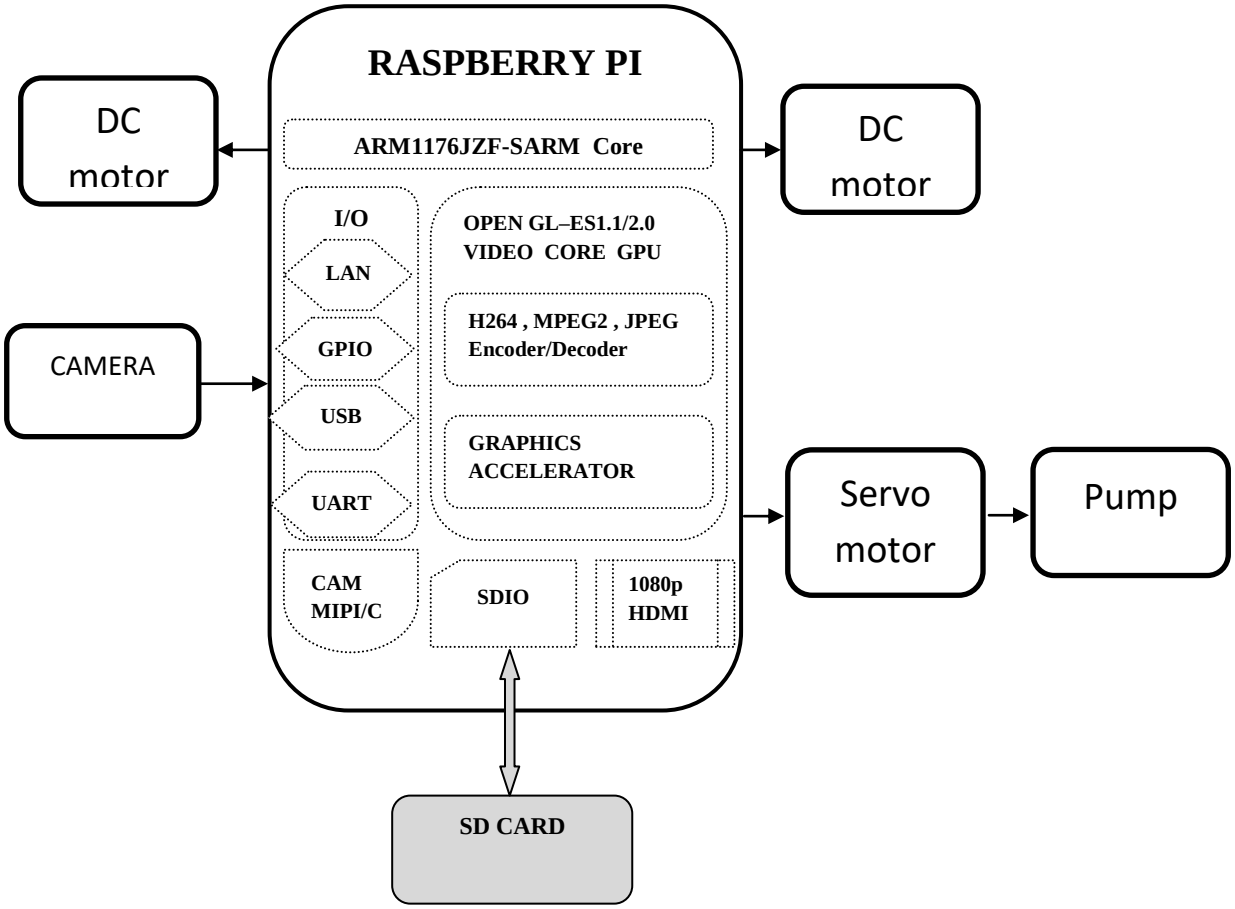
a. BLOCK DIAGRAM:



In this, we can detect the affected crops by capturing the image by using cameras. This also provided the main advantages for the farmers for the easy identification of the defected crops.

IV. FUTURE SCOPE

This system can further detect and control the pests that affect the crops by using image recognition which is being updated day by day. By this, we can expand the model further and detects the pest by capturing the affected crops image according to our choice.

V. CONCLUSION

In the growing urbanization and the increased population, the effective pesticides plays a vital role. Manual work for spraying pesticides is very expensive, time consuming and harmful for human races. This paper presents a smart solution for this manual process and also provides the easy way to reach the crops with the needed quantity . The proposed system can be deployed on domestic scale agriculture or on a villages. This module can be provides the mobile robot to detect and capture the defected crops and intimate to the users.

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