IDENTIFICATION OF CROP HEALTH USING NEURAL NETWORK

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ABSTRACT:

In this paper, we have done surveys on DL raspberry pi techniques to detect these diseases. During this paper, we've planned a system using raspberry pi to find healthy and unhealthy plants. We've got used a tensor flow tool for numerical computation. It is often utilized in Associate in Nursing controlled atmosphere farms such it detects the signs of malady whenever they seem on the leaves of the plant.

Keywords:
Convolutional Neural Network (CNN), Deep learning, leaf dataset, Epochs, Hidden Layers, Tensor Flow , Keras , Raspberry Pi, Pi Camera.

I. INTRODUCTION:

Agriculture is a key source of livelihood. Agriculture provides employment opportunities for village people on a large scale in developing countries like India. India's agriculture is composed of many crops and according to a survey nearly 70% of the population depends on agriculture[1][1]. Most of Indian farmers are adopting manual cultivation due to lagging technical knowledge. Farmers are unaware of what kind of crops that grow well on their land. When plants are affected by heterogeneous diseases through their leaves that will have effects on production of agriculture and profitable loss and reduction in both quality and amount of agricultural production. Leaves are important for fast growing of plants and to increase production of crops. Identifying diseases in plant leaves is challenging for farmers and also for researchers. Currently farmers are spraying pesticides to the plants but it affects humans directly or indirectly by health or also economically. To detect these plant diseases many fast techniques need to be adopted.

Thus detection of plant diseases plays a significant key role within the arena of agriculture. Indian agriculture consists of many crops like cotton, wheat. Indian farmers conjointly grow sugarcane, oilseeds, potatoes and non-food things like occasional tea, cotton, rubber. Of these crops support the strength of leaves and roots[2][7].

Figure 1. Image Cropping Example.

There are things that cause totally different diseases for the plant leaves, that spoil crops and at last it'll have an effect on the economy of the country. These huge losses are often avoided by early identification of plant diseases. Farmers get a lot of difficulties in characteristic of these diseases, they're unable to require precautions on those plants because of lack of information on those diseases. Medicine is one among the fields accustomed to discovering plant diseases.

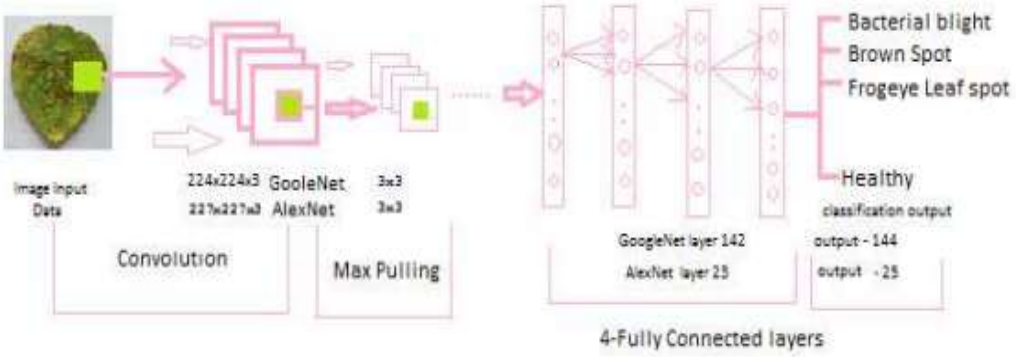

Figure 2. Proposed CNN General Architecture[4][1].

Within the current day among this field, the image process ways are an appropriate, economical and reliable field for sickness detection with the facilitation of plant leaf pictures.

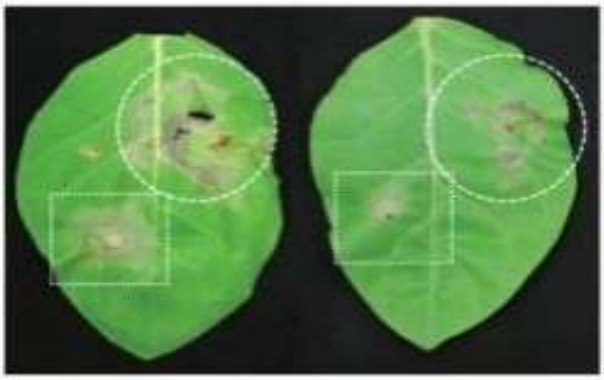

Figure 3. Enhanced image of leaf

Farmers want quick and economical techniques. India may be a cultivated country and seventieth of the population depends on agriculture. Finding the appropriate pesticides for plants. Malady on plants leads to the many reduction in the quality and quantity of agricultural products. The studies of sickness hash out with the studies of visually evident patterns on the plants. Observation of health and malady on plants plays an important role in flourishing cultivation of crops among the farm. within the fundamental quantity the observance and analysis of plant diseases were done manually by the tough person among the sphere. This needs a tremendous amount of labor and to boot needs an excessive measure. The system uses raspberry pi to look at healthy and unhealthy leaves by working photos and finding accuracy [5][3] .

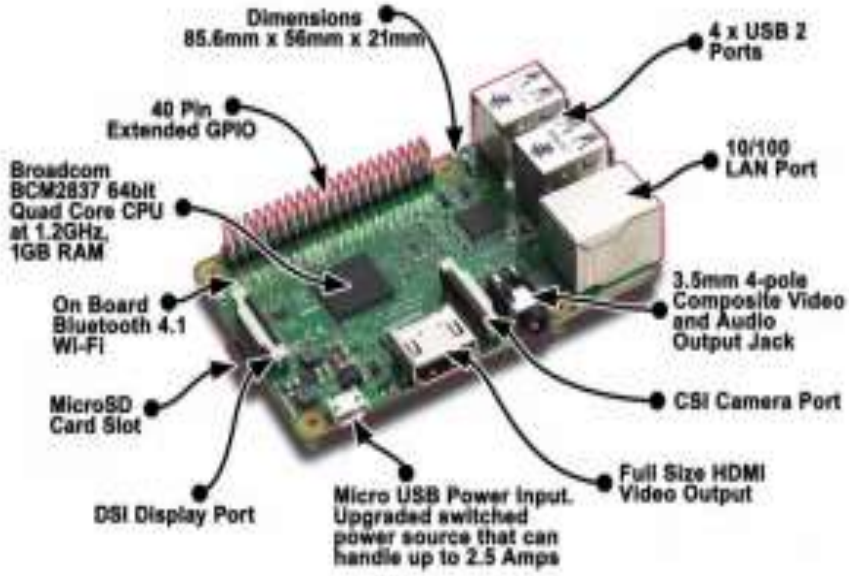

Figure 4. Raspberry Pi [5][3].

Raspberry Pi could be a tiny pc board functioning on the Linux software package that connects to a pc monitor, keyboard, and mouse. Raspberry Pi will be applied to an electronic structure and programming network work, it may function as a private pc and may be put in within the board. A GPIO pin will be used as either a digital input or a digital output, and each operates at three.3V. not like the Arduino, the Raspberry Pi that doesn't have any analog inputs. For that you should use an external analog-to-digital converter (ADC) or connect the Pi to an interface board.[6][5].

Watching of health and malady on plants plays a crucial role in prospering cultivation of crops within the farm. In the time period the watching and analysis of plant diseases were done manually by the experienced person within the field. This needs tremendous quantity of labor and additionally requires an excessive time interval. The system uses raspberry pi to observe healthy and unhealthy leaves by coaching pictures and finding accuracy [4][5].

II. A REVIEW OF LITERATURE:

We use the data set Cotton Disease Dataset as the basis for the evaluation of the leaf health recognition task. The data set is generated with Leaf Image, which consists of Healthy and Unhealthy with different classes [7]. The data set is divided into two parts: one large set is used to train the Deep Neural Network and another example is used for Validation. Another set is used and called the test set. In the next step, we need a set of images to teach the model and upload to using raspberry pi which can detect disease infected leaves [6]. The system has many vertical int leaf detection. So far we have achieved in detecting the disease affected leaf. In future we will segregate the disease whether it is affected by bacteria, fungi or viral and specify the solution to the farmer in the field.

Figure 5.Process of Flow [6][5].

III. IMPORTANCE OF AUTOMATION:

The agriculture department has taken initiative in the prevention of plants from different types of diseases in all seasons. As there are many wireless technologies in the IoT network, each one has certain specifications and benefits[8]. However, it is quite hard to conclude which one is perfect. Therefore, the question that someone needs to answer is which technology is the best one for my application. From this point of view, the current study reviews and compares between the common communication protocols in IoT [9][2].

Automation can overcome the manual observation of disease in plants by applying image processing at Over decades many researchers have experimented lot of research on plant leaves to detect and recognize a type of diseases. This automation can find early disease that helps to prevent damages for plants and list of some diseases and techniques are specified above in the literature review, which actually bring to a close the importance of continuing the research for the next level of competency. The semantic gap in the identification of disease is growing day by day, as finding pathologists is difficult. Automation helps to prevent the spraying of large amounts of pesticides to plants. Moreover this automation can also prevent human effort [10][4].

IV. CONCLUSION:

The above Literature survey has a detailed explanation of the importance of disease detection both to plants and to mankind. To have a meaningful impact on plant diseases & techniques in the area of agriculture, deliberation of proper input is necessary. Research issues addressed here are to develop a systematic approach to detect and recognize the plant diseases that would assist farmers . The paper depicts the importance of image processing in the agriculture field and considering the type of disease for further research work to deal with distinguishing the illness affected leaf. This is often achieved through the Convolutional Neural Network algorithmic rule. If the leaf is laid low with illness then the data is shared through the mail. This helps the farmer to search out an answer while not coming back towards the section.

Because IoT may give information from attached sensors in agriculture. Based on this conclusion and result, research can be focused for large smart agriculture in order to yield better productivity

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