



Crop Pest Identification using Deep Learning Techniques

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ABSTRACT

This project offers a pest identification system for classifying helpful and harmful pests in crops. To that end, the initiative first gives a full summary of the available pest-identification techniques, as well as their advantages and disadvantages. This research proposes a revolutionary categorization technique based on the inquiry. The Convolutional Neural Network was used to create the proposed pest identification and classification model (CNN). A dataset of 9,500 photos of 20 distinct pests was used to train the model. The system has been validated against other traditional classification models after being evaluated with a large amount of data. The proposed technique has a classification accuracy of 90%, which is much superior to other conventional methods.

1. INTRODUCTION

Agriculture is one of the most important aspects of Bangladesh's financial system. Almost 65% of the complete populace is immediately or not directly involved in agricultural practises, which has a huge impact on the country's economic system [1]. As a result, inhabitants in Agriculture and crop production are often on the minds of this agricultural nation. However, some manufacturing elements, like as pests, fertiliser, and water, are always present in bumper production. Pests and their effects on agriculture productivity is discussed in this paper. [15] It accomplishes this by introducing the deep learning approach to figuring out as well as dividing pests into two groups: dangerous pests and harmless pests. Unfortunately, the majority of Bangladeshi farmers are insufficient Because they are inexperienced and lack the knowledge to distinguish between unsafe and safe pests, they frequently seek to destroy both types of pests, lowering the manufacturing

rate in the long term. As a result, distinguishing between pests that are truly beneficial and those that are harmful is a major difficulty[16]. For the next few decades, This has been a problem that scientists have been trying to tackle for a long time. suggesting a variety of solutions.

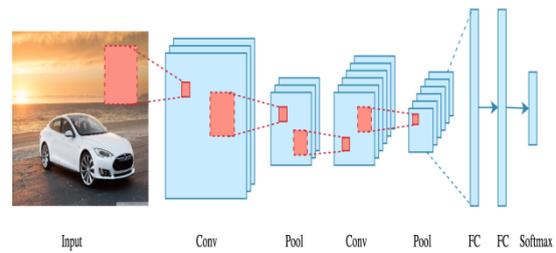
2. EXISTING WORK

In Existing model developed by a genetic algorithm for image segmentation techniques for automatic detection and classification of plant leaf disease. To identify pests by the taken images from the field trip. They did not use any pest specific-engineering. They use image processing and machine learning to diagnose leaf disease from images. The segmentation approach and support vector machine were applied.

3. PROPOSED WORK

TensorFlow, a powerful Python package, was used to create the proposed model. The suggested model, like

existing CNN architectures, has input, concealed, and output are the three levels. Model we've suggested comprises of four Convolutional layers and equal There are a lot of different activation functions to choose from. The model has four maximum polling layers, a later flattened layer, and a fully connected layer that connects the output layer to the input layer. The suggested model has 48x48x32 neurons, 22x22x64 neurons, 9x9x128, 2x2x200 neurons, and 1x1x64 neurons.



5. RESULTS AND DISCUSSION

Here we are presenting our results

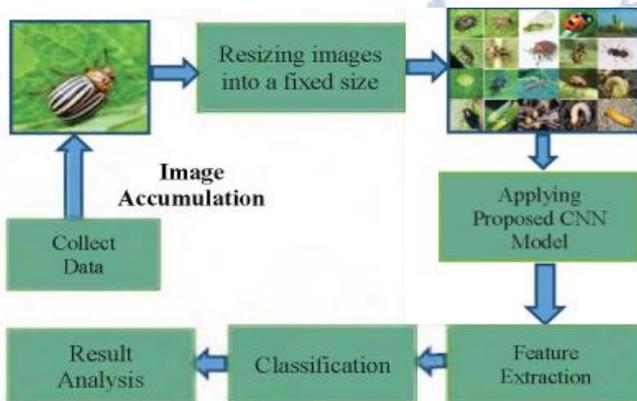


Fig 1: Proposed Model

4. ALGORITHM IMPLEMENTATION

- Convolutional Neural Networks (CNN) is a type of computer network that can be used in a variety of ways. It is undeniably the best. most well-known profound study of architecture. Because of the widespread recognition and success of convnets, there has been a recent increase in interest in deep learning. AlexNet launched the pastime in 2012, and it has developed enormously since then. Researchers went from an In just three years, AlexNet went from 8 layers to 152 layers.
- CNN has become the easy mannequin for any photograph-related issue. They blow opposition out of the water with precise language. It's also useful in recommender systems, herbal text analysis, and other applications. CNN's key benefit over its antecedents is that it detects the key features without requiring Human action is required. It learns unique characteristics for each category on its own, for example, given a large number of images of cats and puppies.
- Furthermore, CNN is highly scalable. It accomplishes parameter sharing and uses one-of-a-kind convolution and pooling procedures. CNN styles may now be viewed on any device, making them widely appealing.

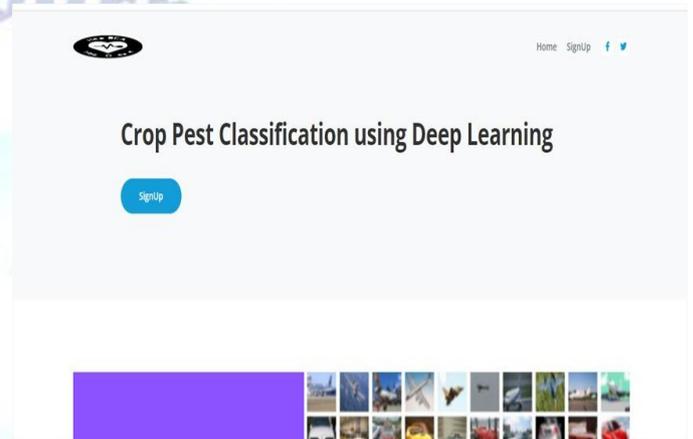


Fig 4: The Above Screen is Our Project Main page

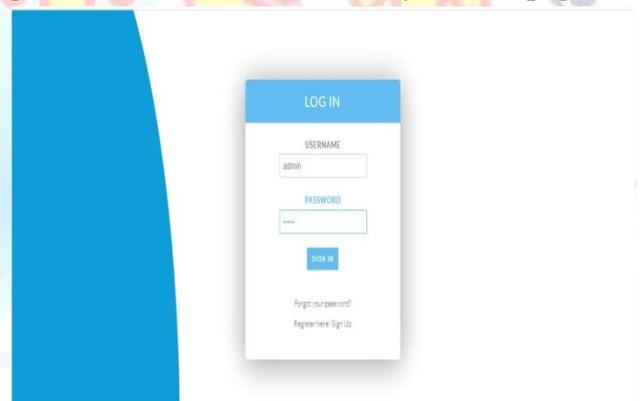


Fig 5: In the above screen user can login by using valid input name and password if the user name and password correct then only the user can login otherwise it will show some error.

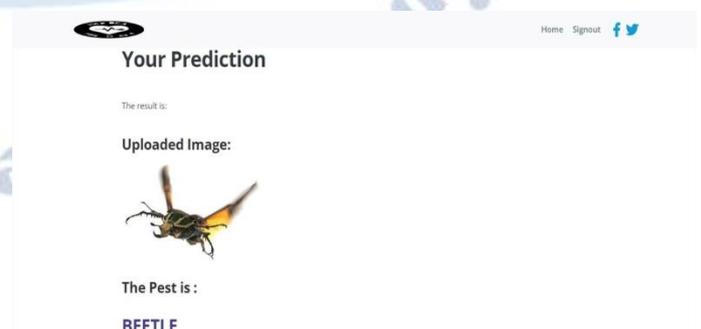


Fig 6: In the above screen we can see the output our project. First we have to upload input image based on that we get pest information.

6.CONCLUSION

A pests-classification mannequin set totally on CNN utilized to be cautioned in this article. The proposed mannequin gives great amenities to the ranchers to understand really useful and detrimental bugseffectively. To set up the mannequin bugs with two special lessons have been viewed the place every type take 10 extraordinary species. A massive quantity of pests' pics have been taken to educated and check the Framework. The machine considers more than a few sorts of Completely classifying algorithms based on CNN for locating the fabulous predictor. Table three suggests that nearly all CNN strategies have been extraordinarily precise, be that as it may Among all of them, the one proposed is the most appealing. In comparison to the extraction and switch models, the proposed CNN structure takes less time and is less complex to execute. A more accurate and durable mannequin will be developed in the future to improve the accuracy of the pest-identification framework. In the future, a smartphone application will be developed to detect pests and display pest information to farmers. The utility will put a premium on early bug detection and avoiding trim damage from toxic chemicals and harmful insecticides for beneficial insects.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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