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"Plant Detection Using Unmanned Drone via Convolution Neural Network"

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Abstract - Plants are essential resources for nature and people's lives. Plant recognition provides valuable information for plant research and development, and has great impact on environmental protection and exploration. Species knowledge is important for shielding biodiversity. The identification of plants by conventional keys is complex, time consuming, and thanks to the utilization of specific botanical terms frustrating for non-experts. This creates a tough to beat hurdle for novices curious about acquiring species knowledge. Today, there's an increasing interest in automating the method of species identification. Convolutional neural networks are a well-liked realm of machine learning, and are often used for image classification, as during this paper.

Key words: CNN, neural network, plants, image detection, unmanned

1.INTRODUCTION

An image is an artifact that depicts beholding, for instance, a photograph or a two-dimensional picture, that features a similar appearance to some subject usually an object or an individual, thus providing an outline of it. In context of image signal processing, a picture may be a distributed amplitude of color. Images could also be two dimensional, like a photograph or screen display, or three-dimensional, like a statue or hologram the word 'image' is additionally utilized in the broader sense of any plane figure like a map, a graph, a chart, or a painting. during this wider sense, images also can be rendered manually, like by drawing, the art of painting, carving, rendered automatically by printing or special effects technology, or developed by a mixture of methods, especially during a pseudo photograph. A volatile image is one that exists just for a brief period of your time. this might be a mirrored image of an object by a mirror, a projection of a chamber, or a scene displayed on a beam tube. a hard and fast image, also called a tough copy, is one that has been recorded on a cloth object, like paper or textile by photography or the other digital process. In computing digital image processing is that the use of computer algorithms to perform image processing on digital images. As a subcategory or field of digital signal processing, digital image processing has many advantages over analog image processing. It allows a way wider range of algorithms to be applied to the input file and may avoid problems like the build-up of noise and signal distortion during processing. Since images are defined over two dimensions (perhaps more) digital image processing could also be modelled within the sort of multidimensional systems.

1.1.1 EXISTING SYSTEM

Existing algorithm is to find out and recognize objects from unlabeled and unsegmented cluttered scenes. Existing work presented a way to automatically learn to detect instances of the thing class in new images. one among the classes of objects which needs particular attention is that the plant.

1.1.2 PROPOSED SYSTEM

The proposed algorithm has three stages. within the first stage, variety of candidate plant regions are extracted from unmanned aerial vehicle images using morphological operations and watershed segmentation. Each candidate region contains a plant or a non-plant. In the second stage, a deep CNN is trained and established so as to classify each candidate plant region as a plant region or non-plant region. within the end, postprocessing is performed with the aim of further removing non plants.

The extraction of plant regions consists of four steps as show in below fig 1.2.1:
1) Noise filtering;
2) Soil region detection;
3) Plant region segmentation; and
4) Plant region extraction.

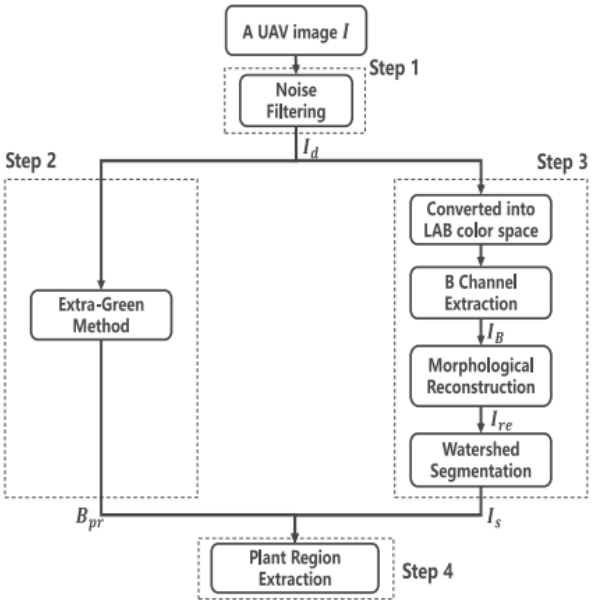


Fig 1.2.1 Extraction Process

A new algorithm supported deep neural networks is proposed to perform the detection of plants in unmanned aerial vehicle images. To the simplest of our knowledge, this is often the primary research on detecting plants in unmanned aerial vehicle images. The proposed algorithm is evaluated on a unmanned aerial vehicle image dataset.

2. SYSTEM ARCHITECTURE

System architecture is that the conceptual design that defines the structure and behavior of a system. An architecture description may be a formal description of a system, organized during a way that supports reasoning about the structural properties of the system. It defines the system components or building blocks and provides an idea from which products are often procured, and system developed, which will work together to implement the general system.

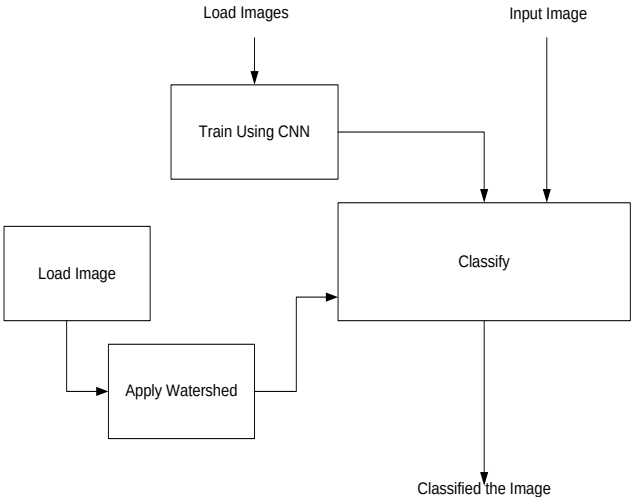


Fig 2.1 Proposed System Architecture

A class diagram within the Unified Modelling Language may be a sort of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, and therefore the relationships between the classes. the category diagram is shown below.

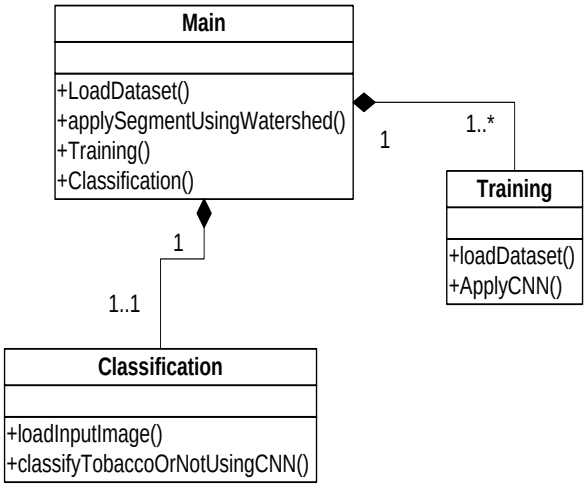


Fig 2.2 UML Model of Proposed System

3.METHODLOGY

1. Load the image
2. To aid the thresholding step
a. Apply pyramid mean shift filtering to help the accuracy of our thresholding step, and
b. Finally display our image
3. Then convert the image to grayscale and apply Otsu's thresholding to segment the background from the foreground.
4. Finally, the last step is to detect contours in the threshold image and draw each individual contour:

3.1.1 WATERSHED ALGORITHM

1. readimage(image)
2. convert the mean shift image to grayscale, then apply
3. Apply Otsu's thresholding

```
gray = cv2.cvtColor(shifted,
cv2.COLOR_BGR2GRAY)
thresh = cv2.threshold(gray, 0, 255,
cv2.THRESH_BINARY |
cv2.THRESH_OTSU)[1]
```

4. Find contours

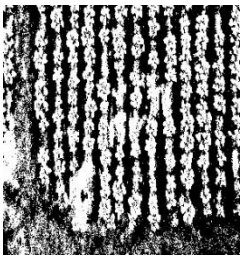
```
cnts = cv2.findContours(mask.copy(),
cv2.RETR_EXTERNAL,
cv2.CHAIN_APPROX_SIMPLE)
cnts = imutils.grab_contours(cnts)
c = max(cnts, key=cv2.contourArea)
```

5. Watershed image

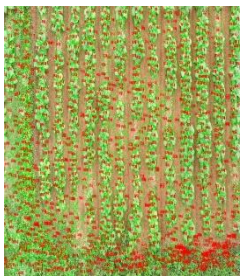
4.RESULT

The following snapshots define the results or outputs that we'll get after step-by-step execution of all the modules of the system

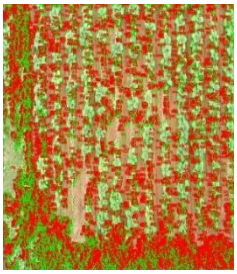
Input Image



GrayScale



Segment Image



Watershed Image

Fig 4.1 Final Output

5. CONCLUSION

Plant recognition is extremely important in agriculture for the management of plant species whereas botanists can use this application for medicinal purposes. Classification in our work typically means to assign a particular plant species to the image supported the feature set extracted. In other words, classification may be a process of identifying the category label of a replacement input image on the idea of the prior knowledge. The main approach of this technique is to acknowledge the various plant in agriculture environment where Speed and accuracy are the most characteristics of detection of plant. Hence, the extension of this work will specialise in developing the advanced algorithms for fast and accurate detection of plants. After reviewing all above-mentioned techniques and methods we will conclude that there are number of the way by which we will detect sort of plants. Each has some advantages also as limitations. Therefore there's scope of improvement within the existing research. Image processing may be a technique which helps to enhance all existing research and which provides fast and accurate results of plant.

6.REFERENCE

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