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WEED DETECTION USING IMAGE PROCESSING

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Abstract: - Increasing popularity in the world needs more productivity in the field of agriculture. In the olden days they use natural method to increase the productivity Such as using cow dung. But natural method is not producing the enough quantity of food. So the farmers choose another method, which is called "Green Revolution". In these period formers uses poisonous herbicides in their field. Those herbicides increase the soil pollution drastic level. The herbicides increase the productivity but damage the environment. In this project we introduce some methods which reduce spraying the herbicides in the field.

Keywords*:* Weed detection, image processing, threshold algorithm.

1. Introduction

In the olden days man power is required for the weed detection. They are employing some person for the weed detection. The person checks each and every place in the field for weed detection and then they pluck the weed by using their hands. Later they started to use herbicides to remove weed in the field. But still weed detection is done manually.

Later some methods are introduced for automatic weed detection. But still there is no method to detect weed accuracy. In this paper our aim is to detect weed in the field using image processing. For this first we need field photography with good clarity. Taking photography can be done by attaching camera in the front of the tractor or the picture of the field is captured manually. Then we apply image processing techniques to that image using MATLAB to detect the weed in the field.

Weed detection

Image acquisition stage

Image acquisition is first stage of weed detection process. The images are taken from the digital camera with good resolution. After the images were taken, they were transmitted to a computer (Pentium 4, Dual CPU, E2160 at 1.8 0 GHz) for image processing and further work.

Binarization

The next step of image processing is to segment foreground (plants) from background (soil). This step is performed through binarizing the RGB images. Binarizing means that the captured images which have the

RGB or true color space, are converted to the binary images which comprise black and white. By applying the threshold, the plants could be segmented as a foreground from and the soil as a background in image.

Edge detection

Edge detection is area of significant change in the image intensity or contrast. Another word for edge detection is image segmentation. Canny edge detection technique is used to detect the edges in the pre-processed images.

A) Threshold Algorithm:

Threshold is one of the widely methods used for image segmentation. It is useful in discriminating foreground from the background. By selecting an adequate threshold value T. Then all the gray level values below this T will be classified as black (0), and those above T will be white (1). The segmentation problem becomes one of selecting the proper value for the threshold

A simple algorithm:

1. Initial estimate of T

2. Segmentation using T:

3. Computation of the average intensities m1 and m2 of G1 and G2.

4. New threshold value:

I G1, pixels brighter than T;

I G2, pixels darker than (or equal to) T.

Tnew =m1 + m2/2

5. If $|T - Tnew| > \Delta T$, back to step 2, otherwise stop.

Morphological Operation

There are several morphological operations are performed here to get a processed output. The steps involved here are.

a) Dilation: The binary gradient mask shows lines of high contrast in the image. The lines do not quite delineate the outline of the object of interest. Sobel image is dilated using the linear structuring elements. The binary gradient mask is dilated using vertical structuring element followed by the horizontal structuring elements.

b) Filling the Holes: The dilated gradient mask shows the outline of the image quite nicely, but the holes (noise) in the interior of the images still appear. To avoid this noise we use filling the holes algorithm. The image that has been segmented has found that some objects connected to its region. The connected borders are removed to give a needed portion as an output. As compared with the original image. This can be done eroding the object. Here we create a diamond structuring element for the accuracy of the image. As eroding the image twice we get a cleared image.

4. Conclusion

The image processing techniques are used to detect weed in the field. The accuracy of the weed detection is better. Accuracy of the algorithm can be increase by using the more features and localized image processing techniques. In the future Accuracy of the algorithm can be incresed by using spectral reflectance features based weed detection and texture features based weed detection, It is poosible to develop Robotic machine which will

Run through Agricultural field and By using the weed Co-ordinates it can Spray herbicides on particular weed plant precisely or by using mechanical tool it Can Up-Root the Weeds.

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A Brief Author Biography

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