A Dynamic Approach In The Application Of Color Preservation For The Flower Yield Prediction

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Abstract— In the area of agricultural field, the accurate forecasting of the yield and their estimation from the raw data are playing the important role in the planning of various aspects of agricultural production. In this paper an attempt has been made to estimate flower yield which helps in providing the knowledge so that it creates the base for flower marketing and its management. The main aim of this paper is to build a system which works dynamically for predicting the different colors of flowers from the field. This flower yield prediction system based on the color features, which must be preserved, is presented to estimate the number of flower of different colors. Through the image processing technique which uses the MATLAB tool, we have achieved flower yield prediction for constructing this automating system which uses the dynamic approach. Therefore the result of the system shows the best potential of the approach which beat the human inspection.

Index Terms— Yield prediction, color preservation, flower color, image processing, flower detection.

1 INTRODUCTION

INDIA is the colorful country and is the known for world's largest producer of flower, fruits, milk, vegetables, etc. There are many different colors of flowers, fruits, vegetables, etc are produced in a year. But the economic contribution of agriculture to India's GDP is steadily declining. For this reason different issues are emerging in the aspects of agriculture production and marketing. These issues have therefore lead to new methods in the agricultural research. The image processing using the matlab, nowadays, playing the role in the yield estimation. The human inspection in the yield prediction has showed the erroneous result and time consuming task in many of the scenarios. Therefore, in this paper, the dynamic system is presented which provide the accurate results over the human inspection. Through the information, the producers are making the profit in the agricultural field and this information is generated by the system. The system works by detecting the required color of flower and then marking them by use of circle in relation to the features extracted from the flowers. These features include the shape, size, color of the flower. The color features of the flower is desired to be preserved so that the result must be produced by considering the pure color, light color or dark color of the flower of that color space. Thus, according to the features of the flower, the presented system detects and counts the flower number. Hence, the objective of this paper is to develop a automating system for estimating the number of flower in the field under the natural daylight condition. The results of this system can be easily operated by any user to create a base for user friendly environment so that dynamically user can recognize the number of flowers and get the knowledge from which planning and management of flower marketing.

2 MATERIAL AND METHODS

The presented work is carried out on the MATLAB 8.1 software and by the help of image processing tool, the image processing task is performed. The images are captured from the flower field for this experiment and these captured images are the set of 8 images.

The digital still camera, from which the images are clicked, is having 10 mega pixels capacity. These images captured from the different scenes and different distances so that the result produced must be including these aspects. For this experiment of constructing the automating system, we have used the core 2 duo microprocessor and 2 GB of primary memory for the rapid and precise result. For the further precision in the output the preprocessing of the images were done like the cropping of images, noise removing operation, etc. For the construction of this system, firstly the images were captured and then applying the preprocessing task as we don't required the date portion which already shown in the pictures of the flower. After this, the flower definition is odne which is carried out by the HSV space. As there are various color spaces like RGB, HSV, YUV, etc. which define the color of the flower. The color of the flower represents the main factor or we can say the main phenomenon of counting the number of flower as the field consisting of different colors of flower and if this factor is being neglected then it might cause false result.

Figure1. Sample flower images

3 METHODOLOGY

In this dynamic system, where the user itself can recognize the number of flowers which are ready to harvest by providing the images and the color of the flower as the input and get the number count of the flower as the output.

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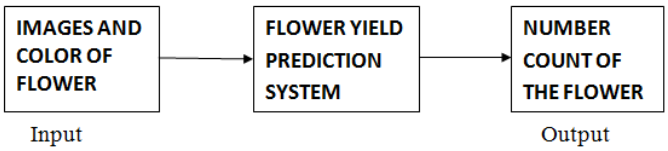

Figure2. Block Diagram of System

In the creation of this system, we have used the methodology for identifying the number of the flower. We start with capturing the images and carried out some image preprocessing task, and then the RGB images are needed to be converted to the HSV for the retrieval of H component. After this, the flower regions from the field are recognized and in accordance to the color features of the flower, we mark the flower with circles and in the last, the circles are counted. Thus, the result is produced which gives the number of flowers of the required color.

Figure 3. HSV Color space

Figure 4. Test Image

The prime focus of the present paper is to detect with pink, red, yellow color flower from the field images. For this detection, the pixel class that defines the flower objects is produced by the help of histogram. The role of flower extraction is conducted by taking the threshold values and this threshold value can be found out from the hue histogram. So, the thresholding method helps in the image segmentation as we need to segment the image into two sections i.e. flower section and the background section. The flower section is represented or by setting to 1-white all pixels and rest background section to 0-black. Then we get a binary image.

$$G(x,y) = \begin{cases} 0 & F(x,y) < T \\ 1 & F(x,y) >= T \end{cases}$$

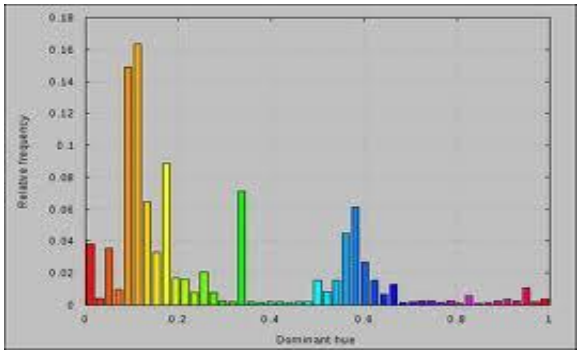

Figure 5. Hue Histogram

On analysing the Hue histogram, there is no fixed value of Hue for the image. Thus we have considered the Hue range as described in the table given below for the color of flower images to define the pixel class.

Color of flower	Hue range
Red	<0.06 or 0.9>
Pink	<0.15 or 0.8>
Yellow	>0.16 and <0.19

Table 1. Threshold value for H

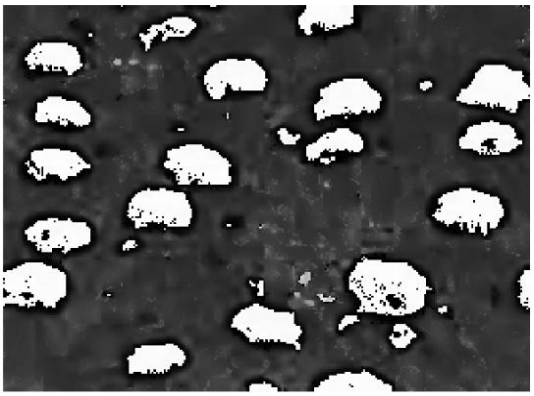

Figure 6. Segmentation result

Therefore, the MATLAB software helps in the experiment of detecting and counting the number of flower and the system have used the tools of image processing for getting the result in the optimize form.

4 RESULTS

The described above approach assist in estimating the flower yield and the desired results are produced by the designed system The images, which were taken from field, containing the flowers with pink, red and yellow colors were examined by the system and the number of the flower count is defined at the end.

Figure 7. Matlab implementation for the system

5 CONCLUSION

Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. Authors are strongly encouraged not to call out multiple figures or tables in the conclusion—these should be referenced in the body of the paper.

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