TEST Engineering & Management

*January - February 2020*
*ISSN: 0193 - 4120 Page No. 1872 - 1877*

# Detection of the Flower from Field Image using Morphological Technique

Ruman Kumari[1], Dr.Vishal Shrivastava[2]
[1]*Scholar, Department of CSE, ACEIT,Jaipur, rumensheoran@gmail.com*
[2]*Professor, Department of CSE, ACEIT,Jaipur, Vishal500371@yahoo.co.in*

***Article Info***
***Volume 82***
***Page Number: 1872 - 1877***
***Publication Issue:***
***January-February 2020***

***Article History***
***Article Received:*** *14 March 2019*
***Revised:*** *27 May 2019*
***Accepted:*** *16 October 2019*
***Publication:*** *11 January 2020*

***Abstract:***
Proposed work focus on designing and implementing an algorithm for detecting and counting red flowers in the field. It uses image analysis technique to identify and estimate number of red flowers in a field with varying light, growth and flower sizes. The algorithm can be used for yield estimation. Identifying the flowers can help the farmer, by providing useful data viz. the number of flowers in a row, bloomed flowers after previous investigation. The proposed technique will be useful to cater the realistic agricultural problems comprising coping with changing light conditions, shadowing, and occlusion. Proposed approach detects flowers by using a fixed threshold, partitioning over the HSV color space, and morphological cues. The threshold classifies the images into dull and brighter images. After that portioning is done respectively on the hue, saturation and volume, then categorized as per flowers size and destiny. The images were gathered from different cameras taken at various angles, distances and periods of the day. Different parameters of images were calculated. For the view facing the flowers than any other view results analysis shows improved performance. Afternoon captured images gives good precision and recall values. No difference is noticed between the images of same location captured using two different cameras. Comparative analysis results in better precision and recall while observing images captured in the noon time and from the front.

***Keywords:*** *Morphological cues, Flower estimation, Recall and precision.*

## I. INTRODUCTION

Identifying entity using computerized vision in agricultural land is a vital need for automation and improvement in cultivation. Yield of crop, pest control, and pollination estimation are some important tasks. Unless we have precise and swift method of identification, these tasks could not override human. The main challenge for research in agriculture field is diversity in agricultural environment. As we know that with increase in the development of different hardware and software technologies Image processing is playing an important role in agricultural research as image processing have key features that define the ability to design prototype solutions which decrease the cost and time. A digital image comprised of specific features, having designated place and weight known as pixels. Thus, in agricultural we need such technology that always deals with time consuming function and give the accurate information on time about agriculture related work. Unusual to manual observation, now different approaches are used to solve the agriculture related problem in yield estimation. Computer vision application are used in recent researches using case studies to get knowledge, I

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get to concluded also that to solve resolve the issues of yield prediction color segmentation play its part. Thus, my literature survey firstly creates an automating system or can say the decision support system that could generate the yield prediction info that helps in formulating the planning and management of flower marketing. The method used for creating proposed framework is image processing which deal with the preservation of flower color by the help of circular Hough transform and morphological technique. In proposed work the images captured from the farm at arbitrary time. The complexity of image is high due to varying size, shape, noise which create a state of randomness while result optimization.

The proposed work aims to develop an algorithm to precisely identify red flowers in differing conditions. Issues dealt with here are:

i. To develop an adaptive approach to dealt with variable brightness.
ii. To use parameters of image color to do classification as per changing illumination.
iii. To identify flowers in images concerned having increased accuracy and less false positives.

## II. METERIALS AND METHODS

### *A. Image Acquisition*

In experimental setup task of detecting and identifying flowers is performed on the sample set of images captured from the field. It is not possible to capture whole field in one photo. Also, image capturing large field may be blur and may result in flower's poor discrimination or identification. Thus, images are captured in segments of the field, are then processed one-by-one and individual results are then combined to give final count.

Fig1. Sample image

### *B. Database*

The proposed image processing and result analysis is implemented using software MATLAB version15, and, to get accurate and consistent result, the images were preprocessed using methods such as cropping, filtering etc thus reducing the entropy of images. Every image captured in natural environment is get contaminated with noise, may be due to bright or dim lights, movement of camera etc. which finally hamper the experimental result for detection of flowers to be false positive or negative.

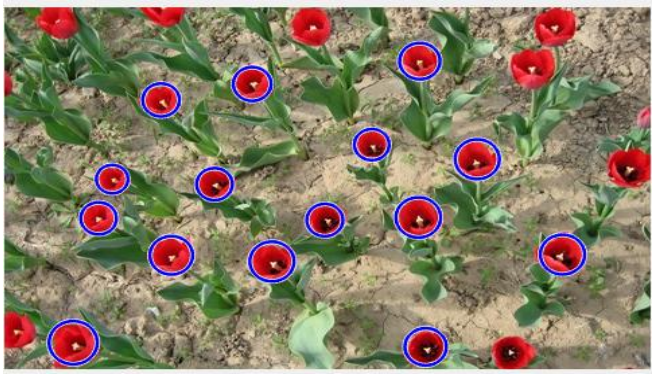

Fig. 2 Examples of tagged image

### *C. Algorithm*

Proposed procedure is explained by Fig. 3. Firstly, light conditions are estimated then the image color space is converted from RGB to HSV. Secondly, partitioning of image as front part and back part is done using color grid as per light, and thirdly,

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separation done on the separated front part to decide whether it is flower or not, based on its size and destiny. Input RGB image to algorithm and it outputs result as a extracted flowers, each having associated component and its coordinate's position, displayed as a binary image. While Implementation of the proposed approach real time possibilities were considered.

The flowchart explaining the process is as follows:

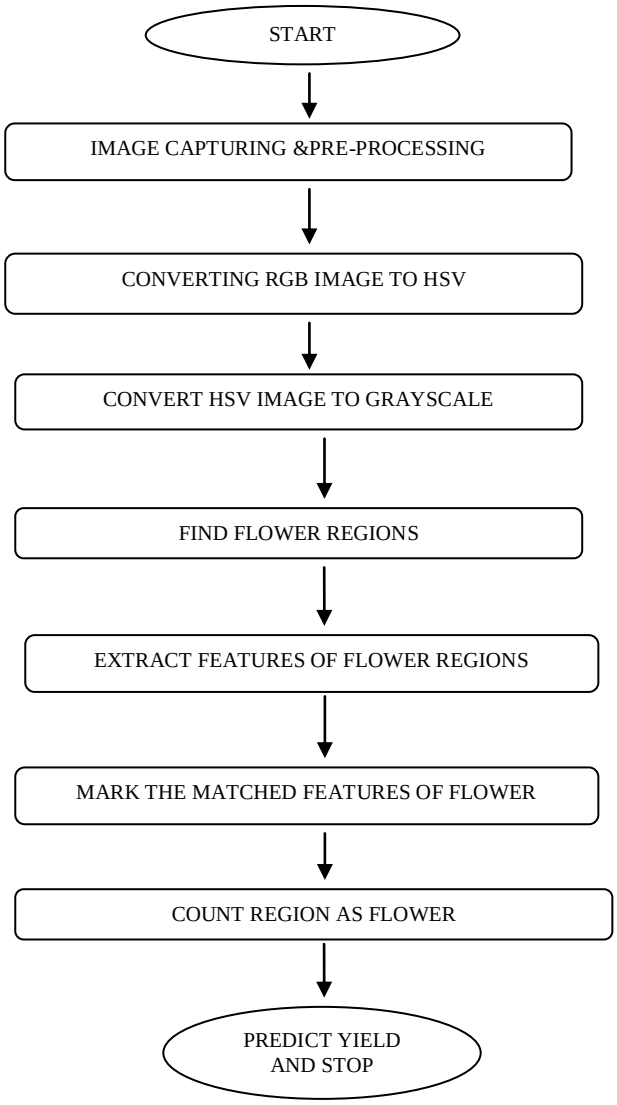


Figure 3.Process Flow chart

### *D. Image Analysis*

The prime objective of proposed work is to extract red color flowers from the field images. Framework first extracts color of petal from the background. As given in literature, for the flower extraction HSV color space is taken account off. To pick up red flower, the pixel showing objects as flower is identified.

### *E. Flowers Extraction*

From image of field flower's detection and extraction is done using image partioning threshold approach. Threshold approach consists of partitioning of regions of image: front regions and a back region. The partition of image in gray scale, works by fixing all white pixels to 1 that are above the boundary of grayscale, known as the threshold, and all other pixels are fixed to 0-black (1). This resultant image is known as a binary image.

The selection of threshold can be done manually by trial and error or by software using a histogram as a guide. In proposed work, thresholds are selected as per the flower images HSV histogram.

## III. IMPLEMENTATION

The whole procedure of identifying and extracting flower consist of several steps. Threshold value is determined to identify the object as flower region using histograms guide of various red flower images. Image partitioning is then performed. Extraction of The object region features as flower is done and marked in the digital image.

The experimental steps are as follows:

Step1. First we have to browse image from our collected image data from which we need to count flowers and select color as red.

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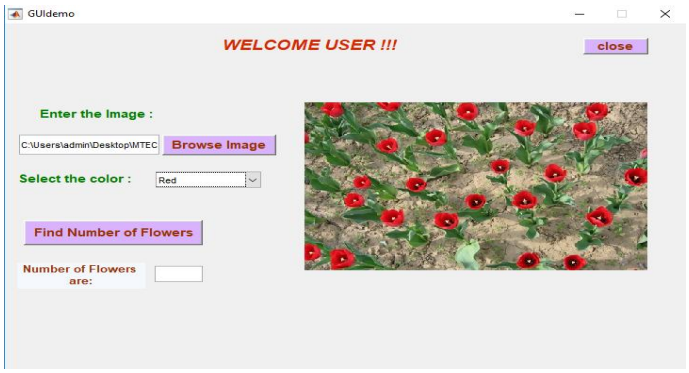


Figure 4. Starting window

Step 2. After browsing image we run the program for finding number of flowers and get a color preserved image which hightlight the red color.

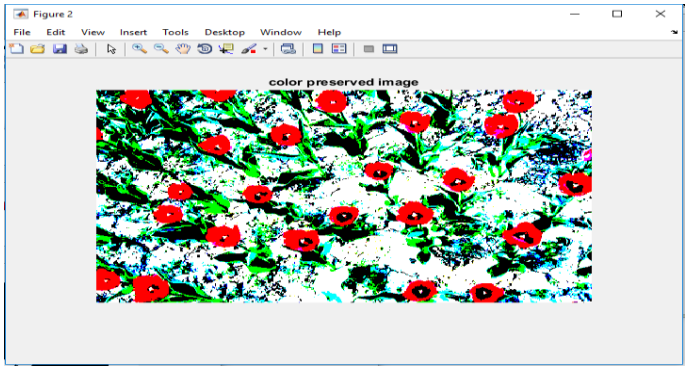


Figure 5. Color preserved Image

Step 3. After identify the color in the image its give us image as hue form wich clearly define the flowers on white(flowers) grey(background) form.

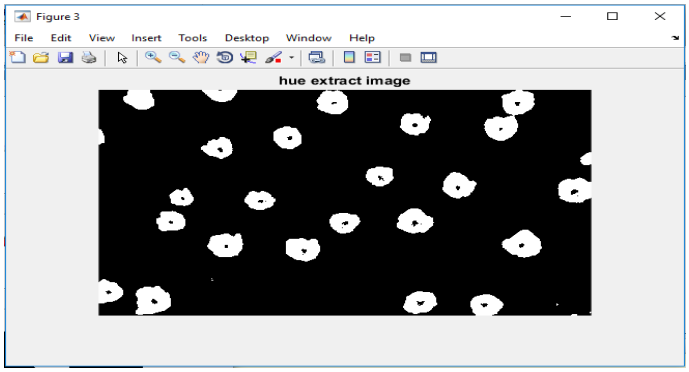


Figure 6. Hue Image

Step 4. After hue image it remove the noise which created due to same color of other objects or due to light or other factors and give a noiseless image.

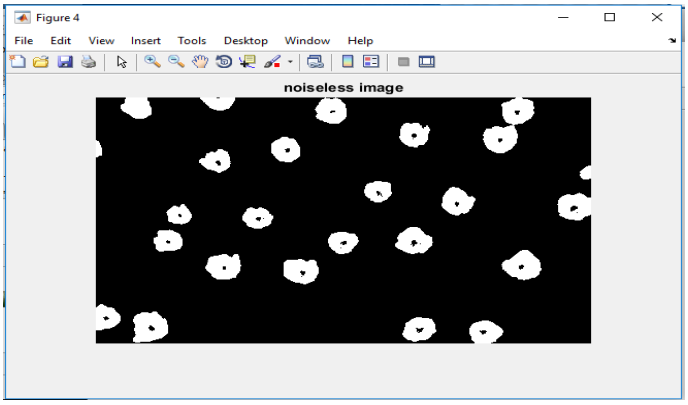


Figure 7. Noiseless Image

Step 5. . Now at finally we get a extracted image which only feature flower area in the image.

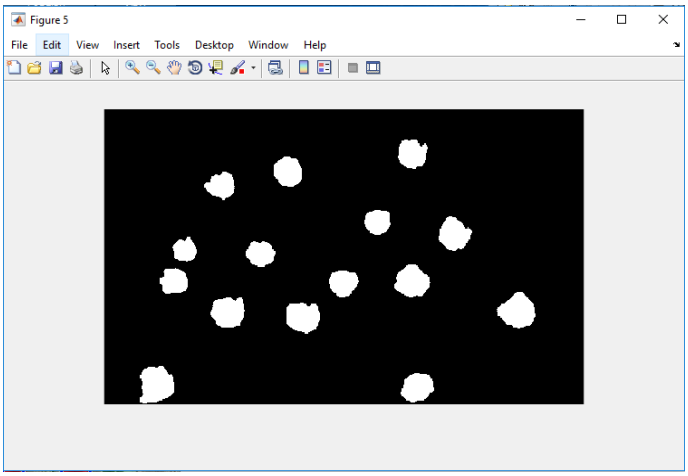


Figure 8. Extracted feature of flower image

## IV. RESULTS

The results were obtained from the proposed framework developed in MATLAB. Set of images of fields, having flowers of Red colors along with other flowers were taken under test as input. For counting the flowers, in different conditions of field environment and image parameters the proposed algorithm accuracy was varying. The overall accuracy of the framework designed is estimated to be 87.03%. However, overlapping of flowers is a major limitation.

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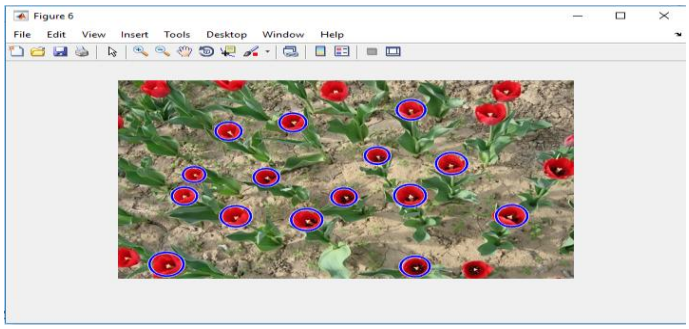


Figure 9. Marked flowers for counting


Figure 10. Result as count

Accuracy can be calculated using following expression

$$\text{Accuracy}(\%) = \left\{ \frac{\text{Algo count}}{\text{Manual Count}} \right\} * 100$$

| Image no | Manual count | Algo count | Accuracy(%) |
|---|---|---|---|
| 1 | 17 | 15 | 88.23 |
| 2 | 13 | 11 | 84.61 |
| 3 | 1 | 1 | 100 |
| 4 | 20 | 16 | 80 |
| 5 | 16 | 13 | 81.25 |
| 6 | 59 | 52 | 88.13 |
| Overall accuracy is 87.03% | | | |

Table : Table of counted reading

## V. CONCLUSION

Images captured at noon time from viewpoint front of the plant gives good values of precision and recall. Optimized values of hue for identifying the red and other flowers were determined. Proposed framework is able to fulfill the research objective by identifying and counting the number of flowers in image of field. Thus it can be predicted that image processing can also be used in yield prediction. To some extent result was influenced by environmental conditions. The resultant discrepancies are due to basic limitations like degree of brightness, overlapping, etc.

## VI. ENHANCEMENTS IN FUTURE

Clearly the objective I have proposed had proved its result but at some places there is limitation due to the problems faced in the preprocessing of images. The images might have contained some noise problem, overlapping of flower and also the lack of some texture recognition problem, etc. So this sort of problem which have faced can be removed by taking the new approaches and applying the technique to the best. There can be use of an attempt in the future to make it as better as the desired result produced with precision. By the use of the different other approaches and methods like image segmentation methods, filtering methods, texture recognition methods etc we will usually prove this objective in the future as the better result and some issues must needed to be solved in the nearer future.

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