

# Finding Best Colour Shade Match Using HSV Format of Image

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**Abstract**— This paper present a simple methodology for finding the best match of an image from reference color formats using HSV format of image. Image processing is a field of science have a number of application in technical fields where we are dealing with images. In many fields like agriculture to filter out the impurities of different size rather than the pure yield. Image processing provide some simple algorithms for size based prediction of fixed size objects from objects of different sizes in an image using MATLAB commands. In real life applications like face detection or size based rating of different fruits of vegetables etc. So this paper presents the dignified approach to extract the concerned size from an image.

**Key words:** Image processing, Thresholding, masking, color

## I. INTRODUCTION

Image processing is a field of technology having a number of applications in many different fields like medical, edge detection, object detection and pattern reorganization etc. In many applications we need to find best match of a particular pattern and image. This is basically related to the agriculture field. Sometimes we need to know some properties of the leaves of a plant to protect it from some properties or to fulfill some other requirements for its growth. In this problem a color chart of dome different shades are provided and we have to find the best match of the leaf color from these color shades.

## II. METHODOLOGY

In this section a simple method is proposed to find a best match of leaf color from the color shade colors. All the steps are implemented by using MATLAB 2013a.

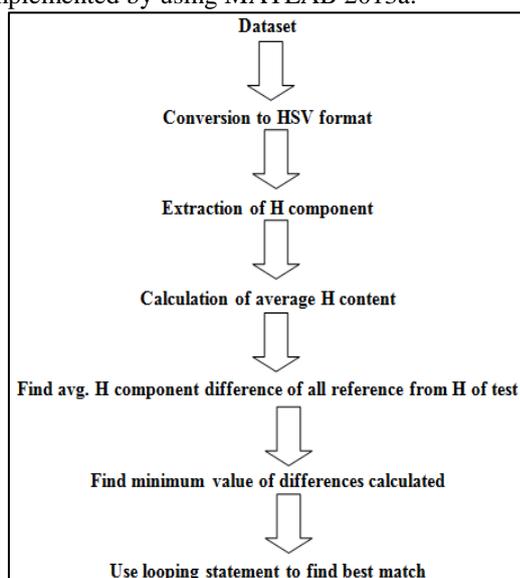


Fig. 1:

The flow chart above gives the detailed description of an algorithm.

### A. Dataset

In the dataset an image of the leaf is captured by an image capturing device of 13 mp resolution power and a color chart of different color shades of green color contains 6 different color shades based on the intensity of color like light green to darkest green. This chart is used as the reference colors and the captured image of the leaf is used as the test image.

### B. Conversion to HSV format

There are different types of image formats are available to process an image in the image processing toolbox having specific properties or different contents in the image. The image captured or the reference color formats used in this methodology is in the RGB format has red, green and blue color contents for each pixel. A need of conversion from RGB to HSV format having three content values H, S and V. This is done because the HSV format is more efficient and accurate for such types of problems because HSV formats represents the original color vision of an image.

### C. Extraction of H content

Extraction of H content from the HSV format is executed in the very next step which gives the exact color vision of all the references and test images. This extraction is done by using a simple inbuilt command of MATLAB.

### D. Calculation of average H content

The value of H content is variable pixel to pixel in the image so comparison of the H content of test with reference is by using exact values directly so find the average value of the H content of test image and the reference image.

### E. Find avg. H component difference of all reference from H of test

The value of H content is variable pixel to pixel in the image so comparison of the H content of test with reference is by using exact values directly so find the average value of the H content of test image and the reference image.

### F. Find minimum value of differences calculated

After calculating the average value of H component of test and reference color formats, calculate the difference of H content of all the reference color formats from the average H content of test image.

### G. Find minimum value of differences calculated

Find the minimum value among all the differences calculated of average H content of all reference color formats from he average H content of test image.

### H. Use looping statement to find best match

Use the if else looping statement to find the best match of test image from the reference color formats. By using these looping statements compare the minimum value with the

difference of average H content value of all references and test image, the minimum value calculated in above step is same as the difference value of any reference difference that is the best match with the test.

### III. SIMULATION AND RESULT

This section of paper includes all the images obtained after applying operations proposed in the algorithm. This section includes all the images obtained after applying operations proposed in the algorithm explained in the methodology. First and foremost step is to capture the image of test leaf which is having good quality information and illumination. After capturing the image, read this images of reference color shades and test image to MATLAB platform using imread instruction as defined in methodology section. There are different types of image formats existing like RGB, gray scale, binary and indexed images etc. These different images have different characteristics from each other.



Fig. 1: Image of test leaf

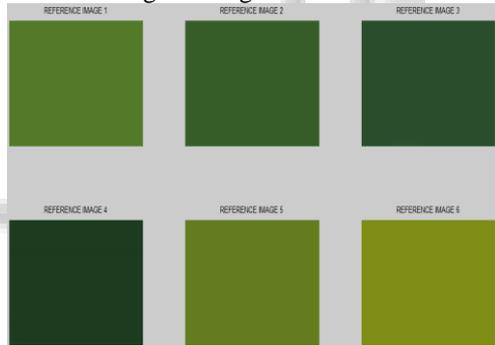


Fig. 2: Image of reference color shades

Figure 1 and figure2 represents the captured test image and the reference color shades to compare and find best match. This image is then imported to the MATLAB platform, using the instruction defined in image processing toolbox. These images are needed to convert to the HSV format. In RGB format the accuracy to find the best match is less and HSV format is the true color vision of a image then the RGB format. So conversion of the format is executed in the next step.

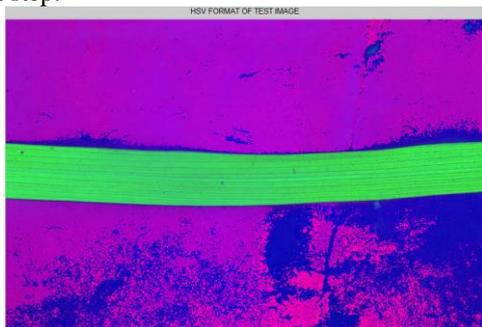


Fig. 3: HSV format of test image

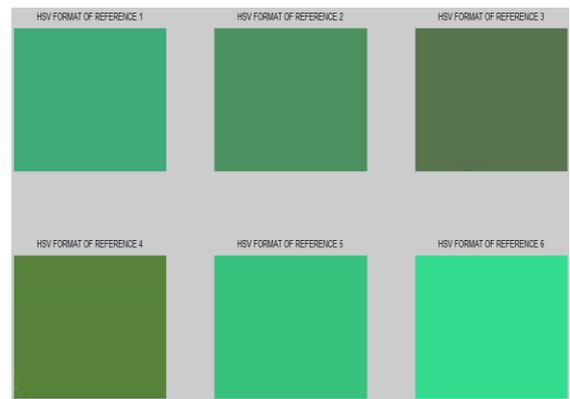


Fig. 4: HSV format of reference color formats

Figure3 and figure 4 represents the HSV format of the test image and the reference color shades. Then, from these images H content is extracted to get proper information and processing.



Fig. 5: Extracted H content of test image



Fig. 6: Extracted H content of all reference color formats

Figure 5 and 6 represents the image in which fundamental H content is extracted and shown in different plots using subplot. After extraction of the H content of test and reference color formats, the average value of H content of all images is calculated. Then, difference of the average H content of all reference color formats from the average H content of test image is determined. The reference image that has minimum value of difference from the test is resulted as the best match with the test image. The best match in this problem after complete processing of this algorithm is founded the reference 3.

Figure represents the result of the algorithm that is the best match founded among all the reference color shades with test image is with reference 3.



Fig. 7: show the best match reference

#### IV. CONCLUSION AND FUTURE SCOPE

In this paper a methodology is defined to find a best match color shade among different color shades. In this various steps are implemented using MATLAB platform. This algorithm can be used in various applications in day today's life, agricultural companies in examining the color of the leafs and seeds of various color shades and prepare a shade chart to easily examine o disease or deficiency of any mineral etc by finding best match with defines color shades in color shade chart. Many applications like floriculture, healthy fruits and vegetable differentiation from other; all this is done using this methodology. Main positive point of this method is its speed and simple steps.

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