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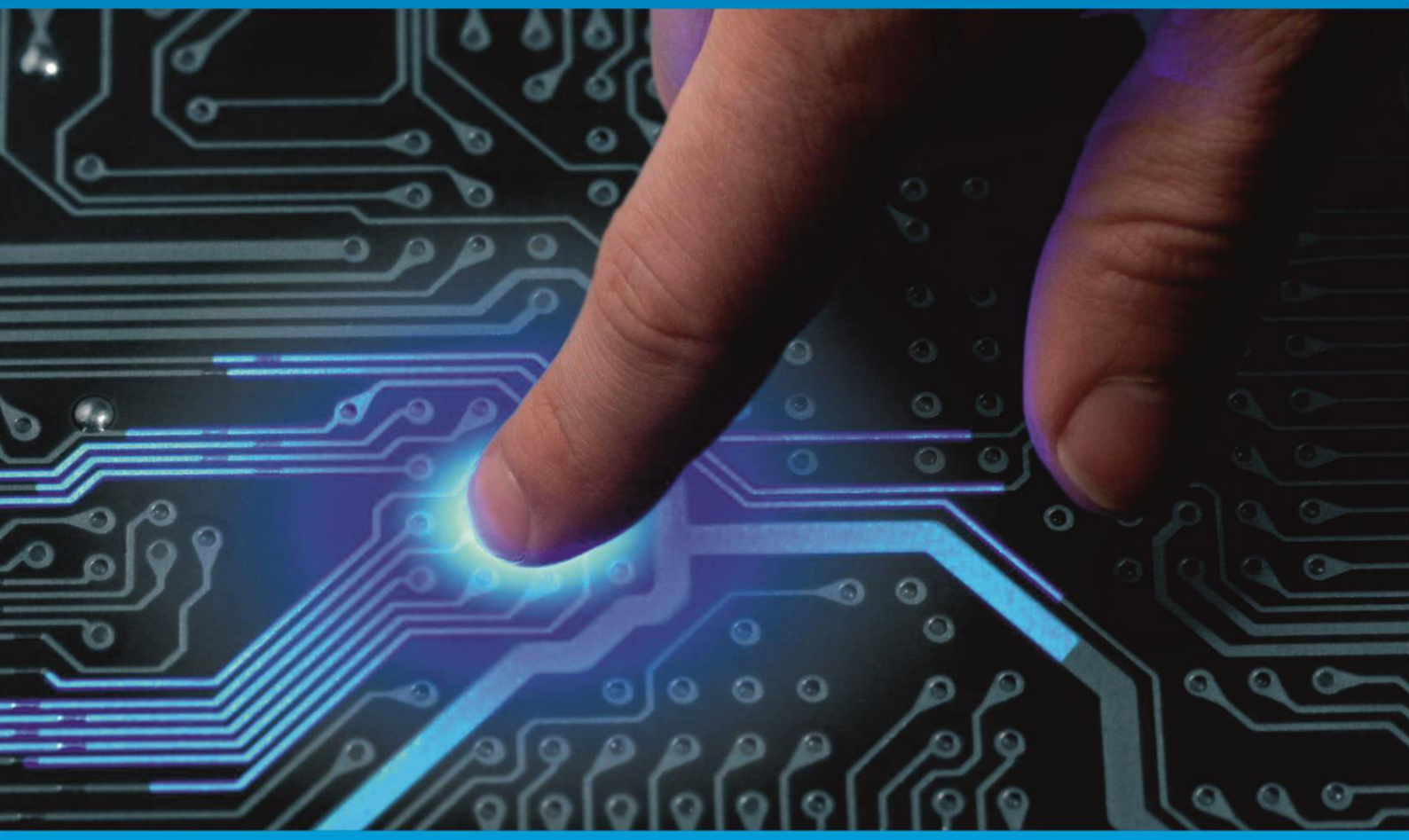

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Color Edge Exposure in Digital Image Processing and Analysis of the filters

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ABSTRACT: Edge detection is one of the most commonly used operations in image processing and pater recognition, the reason for this is that edges from the outline of an object. An edge is the boundary between an object and background and indicates the boundary between overlapping object. A color image edge detection is proposed in this article were considered the three different channels of the color image like Red, Green and Blue channel in the given image, using the threshold in the given image we are trying to find out the edges and also we are tried the filtering to the noised in an image and try to come out with the best filtering for a different nature of image.

KEYWORDS: Edge, Color image, Red, Green and Blue channel

I. INTRODUCTION

In digital image processing, the edge detection plays a significant role in image analysis and computer vision areas. The high level image processing applications such as object or edges for image recognition, object following, robot vision etc. depends upon the performance of edge detection technique. Edges may be defined as boundaries between distinct regions present in a particular image and they contain the most relevant information of the image.
There may be different region of interest present in an image which is characterized by the properties like gray level, texture, intensity etc. In case of color image processing, Color images require more memory space for storage than grey scale images and also the transmission of color information requires a larger bandwidth. By using an efficient edge detection technique, the unnecessary details of a color image can be discarded and the useful information can be stored for further processing. This can effectively reduce the memory space for storing the color information and lower the transmission bandwidth.
The edge detection techniques can be broadly classified as:

- Grey-scale image for edge
- Color Edge detection using RGB channels

The fundamental difference between a grey-scale image and a color image is, the pixel in a gray-scale image is a scalar valued function whereas in color image, a pixel is considered as a vector valued function as it consists of three color components (Red, Green and Blue). Due to this, vector valued techniques are preferred for edge detection in color images. Novak and Shafer found [1] that 90 percent of the edges are about the same in gray value and in color images, these 10 percent may be important for a consecutive processing step as, for example, edge based image segmentation or edge-based stereo matching [2], a more sophisticated approach is suggested by Cumani [3].

Edge detection plays a significant role in vision processing. Edge recognition is the name for a set of mathematical methods which target at classifying points in a image at which the image intensity varies sharply or, has discontinuities. The points at which digital image intensity turns sharply are stereotypically ordered into a set of line segments called edges. The similar problem of discovering discontinuities in 1D signal is identified as step detection and the problem of discovering signal discontinuities over the time is called as change detection. Edge detection is essential instrument in vision processing, machine vision and digital image processing, mainly in the areas of feature recognition. The edges can be used later for segmentation of the image into objects. The most straightforward edge detection can be done by using thresholds: pixels with gray level above some threshold are considered to be in one group and all the other pixels in the second. The edges should appear when you cross the border between the groups. The approaches are based on the Sobel operator, the Laplace operator, the Mexican Hat operator [4], different realizations of the Cumani operator [3], and the Alshatti-Lambert operator [5].

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II. PROCESS INVOLVED IN EDGE DETECTION

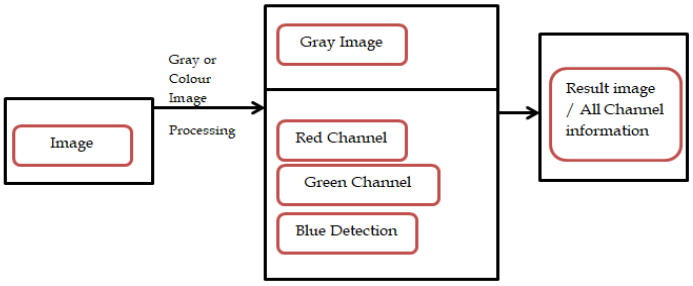

Figure-1 Edge Detection

In the figure-1, the flow diagram represents the steps involved in identifying the edges in the given image. Firstly the edge detection required the gray scale image for the edge detection, due this step processes if the given image is gray scale we directly apply the method to get the edge depending on the input the different methods are applied to get the edge.

Secondly, the given image is color image, we separate the three channel namely Red, Green and Blue channel for the color edge detection, has shown in the block diagram the next stage we apply the same method for all the channel and get the edge of all the channel and at last we merge all the channel and get the color edge.

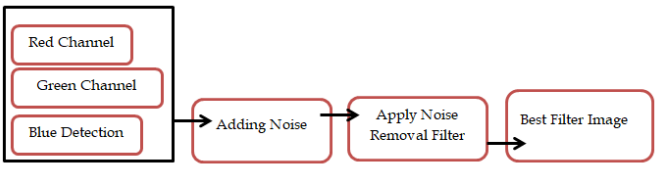

Figure-2 Adding/Removal Noise

In the figure-2, it's a processes of adding different types of noise, due to not available of the noised images, we tried all but for the explanation purpose applied salt and pepper noise to all the channels and combined to check which filter will remove and what are the advantages and drawback of the given image, our software will enable the novel students to work with different methods and helps to arrive to the solution with suitable mask and method has helped.

Finally we can see that the best method and mask for different types of images.

i. More graphics images

ii. Hand written images[6]

iii. MS office typed with different fonts

This will help to demonstrate the method that have been used for the getting the best one for different types of images.

III. RESULTS WITH THE IMAGES

The processes involved in the color edge are elaborated using the following steps

i. First the given image is loaded to the system

ii. Three channel are separated

iii. Applied the method

iv. Merged to get back the original image

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v. Display the result

In the section the image is loaded to the system, so that first the image is identified as gray/color image, then if the given image is color image then all the three channel of the image is separated from the given image, so that the original image can be done at the result.

If the given image is gray the method is easy so that it can be applied directly otherwise apply the method and just user can see that depending upon the nature of the image use can check different method and find which is better for applying the result, in this every method is best depending upon the quality and quantity of the image, but according out experimental result the canny showed the more number of sharp image in the given image compare to other methods, the snap shot are shown from figure 3 to figure 5.

Figure 6 shows the graph of different methods applied for different kind of images and similarly the figure 7 shows the snap shot of the images applied for the edge detection.

The color edge detection is used for different channel and later merged with all the channel of the outputted image to get back the color image, but to out notice the result of the image showed the presence of the edges but with the color with sharp one.

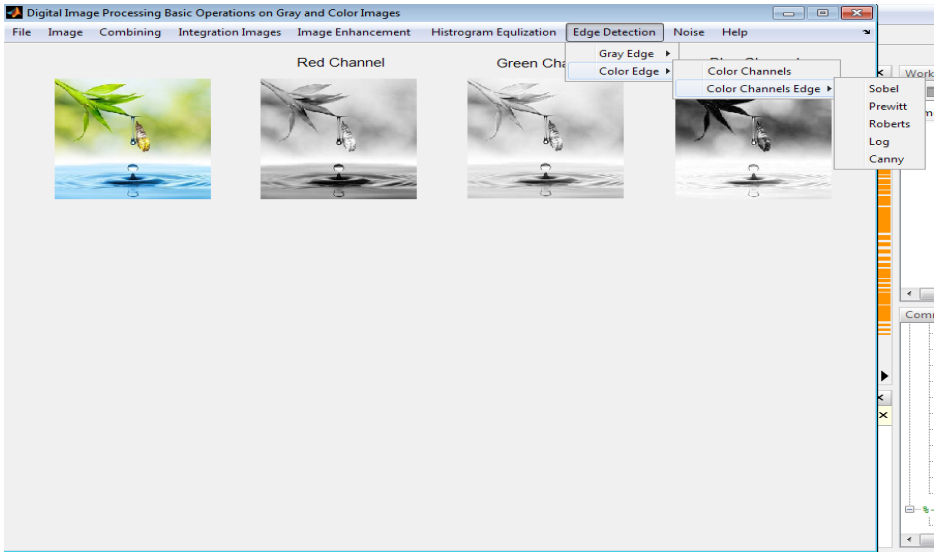

Figure-3Separating different channel in the image

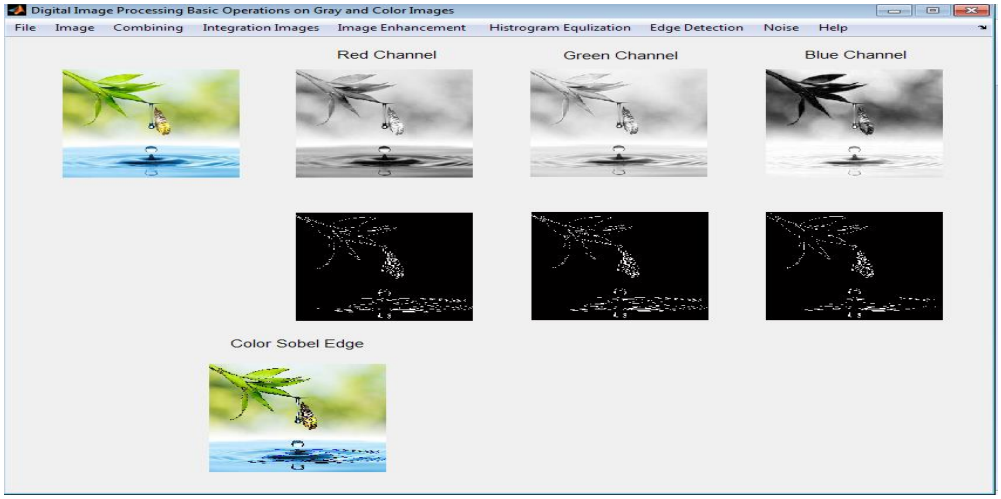

Figure-4Applying the edge detection sobel method

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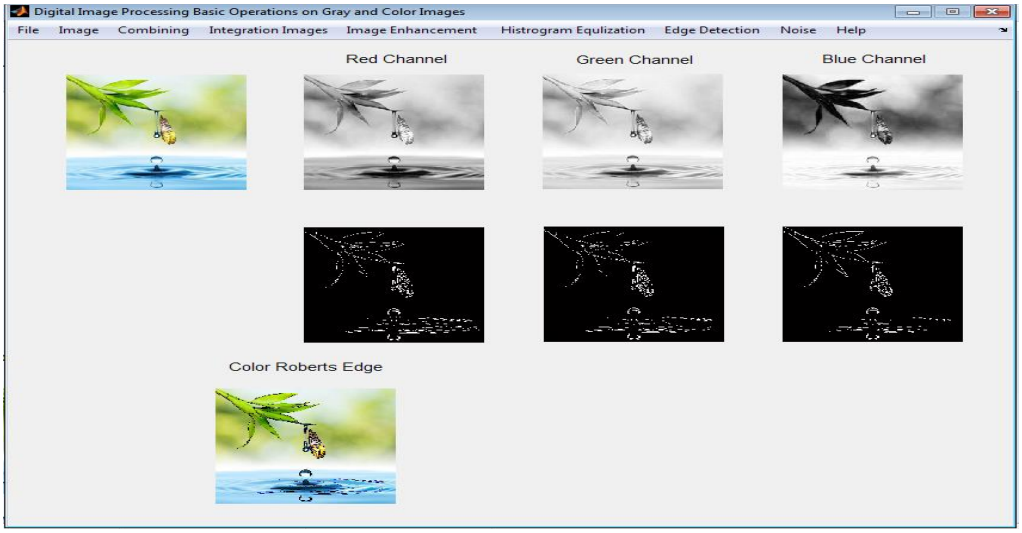

Figure-5 Applying the edge detection Roberts method

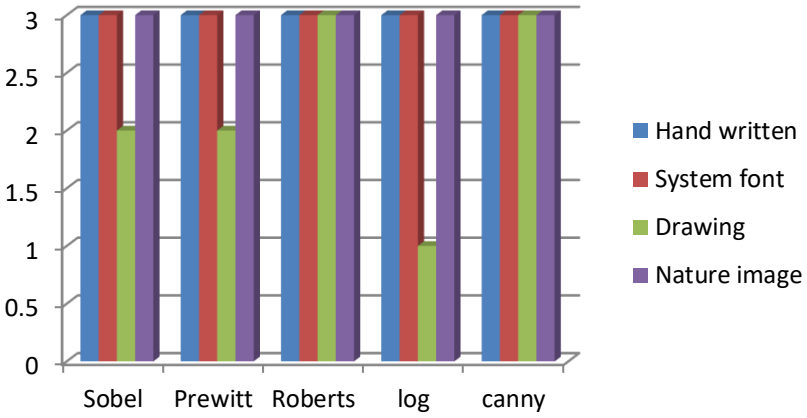

Figure-6 Analysis of different technique for edge detection

Figure 7, interprets the system Microsoft world document font and the hand drawn image were user and the system in hand written also identified the presses impression present in the image also considered the noise or the edges.

So whenever we use the hand written images/ text we should ensure that the page or the sheet should be clear, so that we get the correct and related information in the captured one.

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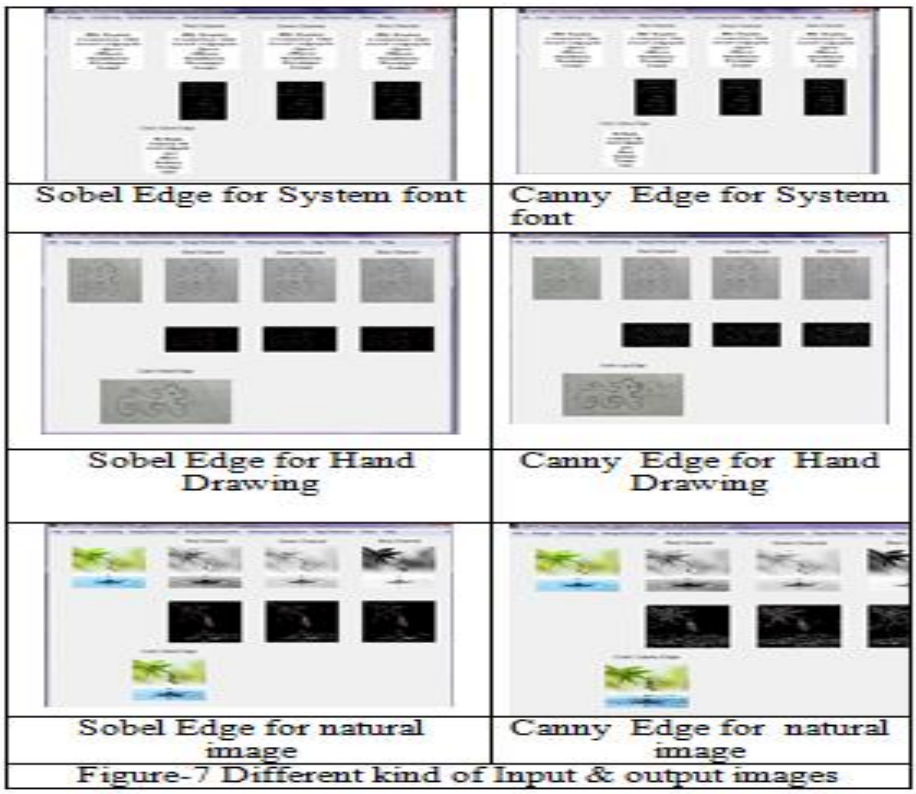

Figure-7 Different kind of Input & output images

In the next phase we have applied the niose to the images and tryied to see that if we apply the filtering techniques what happens to the images and for our obeservation we have foyund that the image goes bluring the image, if still we keep on increasing the filtering at certain level the image data will be collapsed.

This will help the students to know that what happen to those image depending upon the noise and image, but here we tried with all the channel and applied the filtering with all the channel and tried to get back with the importance of the data in the image given such that the image remain 80-90 can be viewed.

Figure -10 shows the study analysis of the image with different types of image and filtering techniques applied .

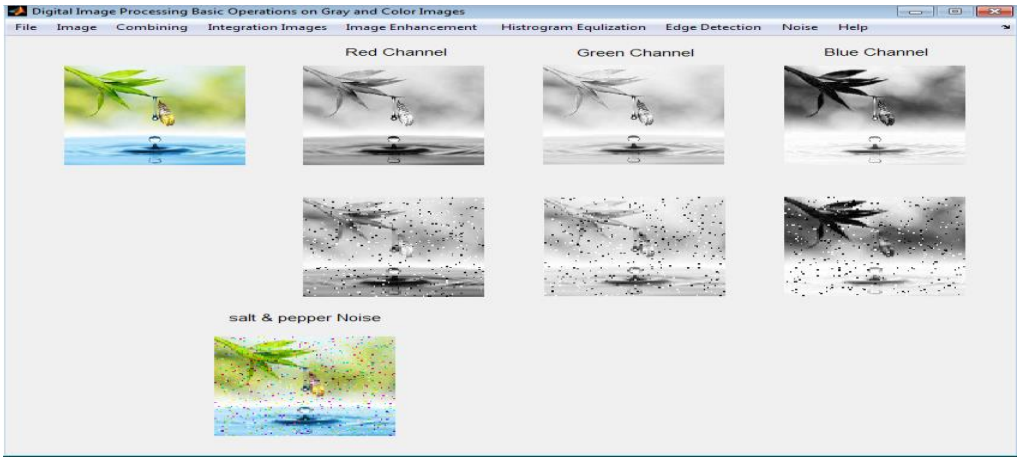

Figure-7 Applying the noise to the image

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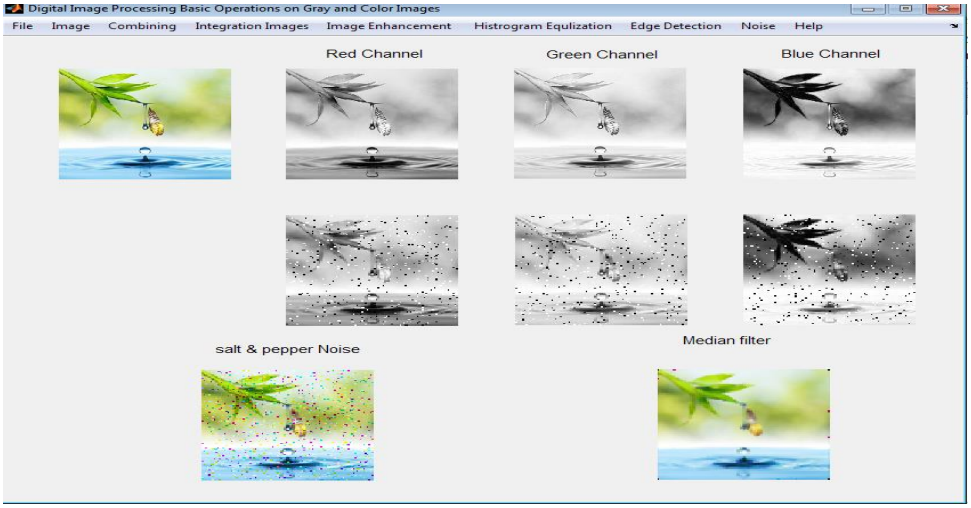

Figure-8 Applying the noise to the image and Removal method

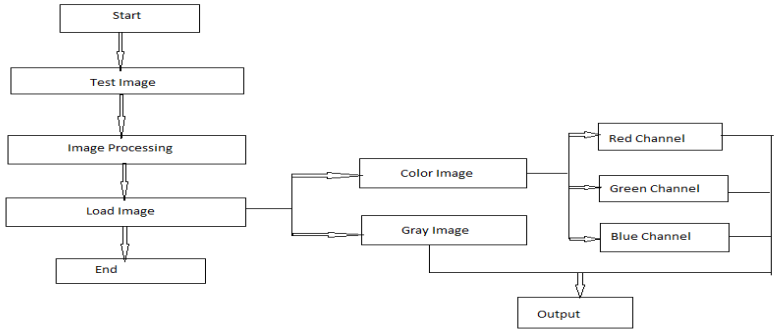

Figure-10 Testing the Images with the software

IV. CONCLUSION

The proposed method is tested on different images. It produced stable and fairly good results. Consistent acceptable output over different kinds of real images has proved a robustness of the presented scheme. Thus the tool helps the novel students to analysis the image, filtering technique in terms of complexity and accuracy of the system output image in the presence of noise.

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