Chapter 4

4. Results and discussion

After the implementation of the algorithm in MATLAB,GUI based program demonstrate in order to easily manipulate different images with different program functions, figure (4-1) below shows the main interface of the application, after selecting an image and using the extraction of the dominant color procedure, In the top left the button to select the image need to be processed, In the right side the color detection section, and below it the image conversions section, and at the bottom there is dominant color and the 3D histogram buttons.
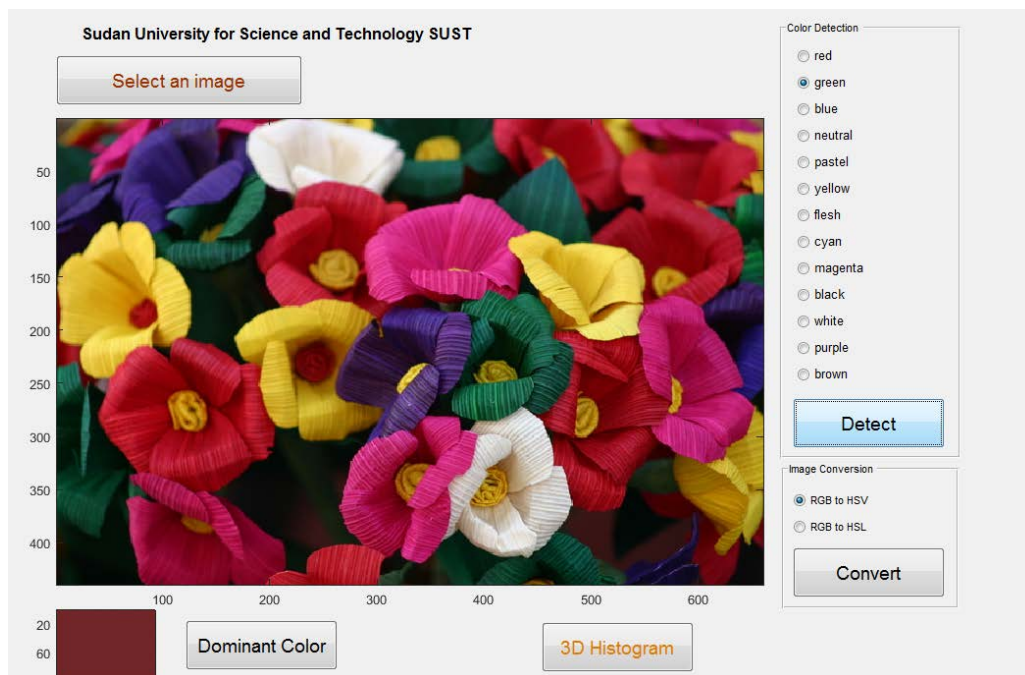

Figure 4- 1: Main application interface with dominant color result

Figure 4- 2 : Dominant Color

Figure (4-3) below shows the using of the color detection algorithm for the same image in figure (4-1), the figure shows the color detection of the green color.
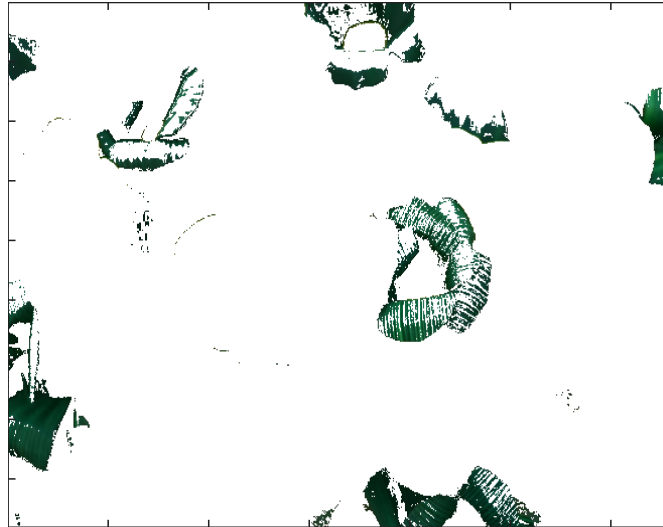

Figure 4- 3: Color detection (green)

The figure 4-4 shows the color detection of the red color.

Figure 4- 4: Color detection (red)

The color conversions of the same image from RGB to HSV model and to HSI is shown below in figure (4-5) and (4-6).

Figure 4- 5: Color Conversion (HSV)

Figure 4- 6: Color Conversion (HSI)

Figure (4-7) shows the 3D histogram of the image in figure 4-1, it shows the mapping of the RGB colors value in each axes.
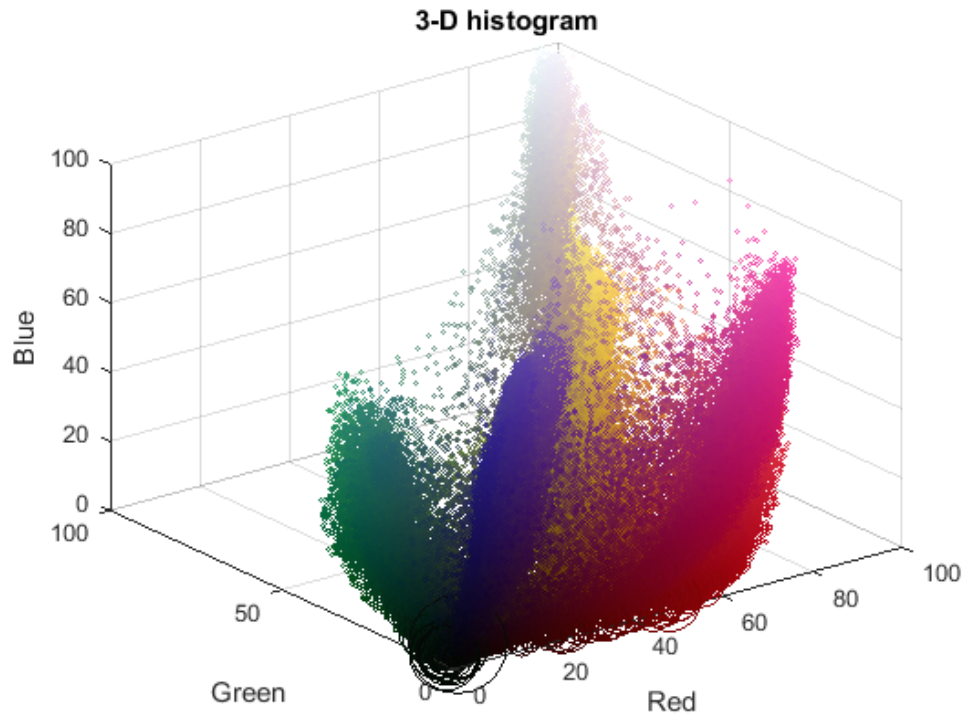
Figure 4- 7: 3D histogram of the image

Then the same application is used with four different images to obtain different results. The images used are shown in figure (4-8).

Figure 4- 8: images used in results

The color detection of the blue color in the above images is shown below in figure (4-9).
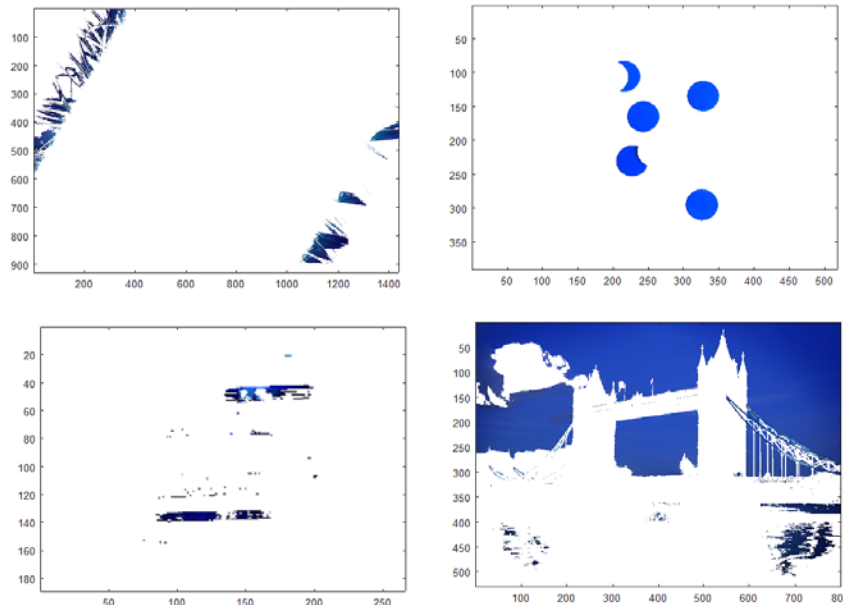

Figure 4- 9: color detected (blue)

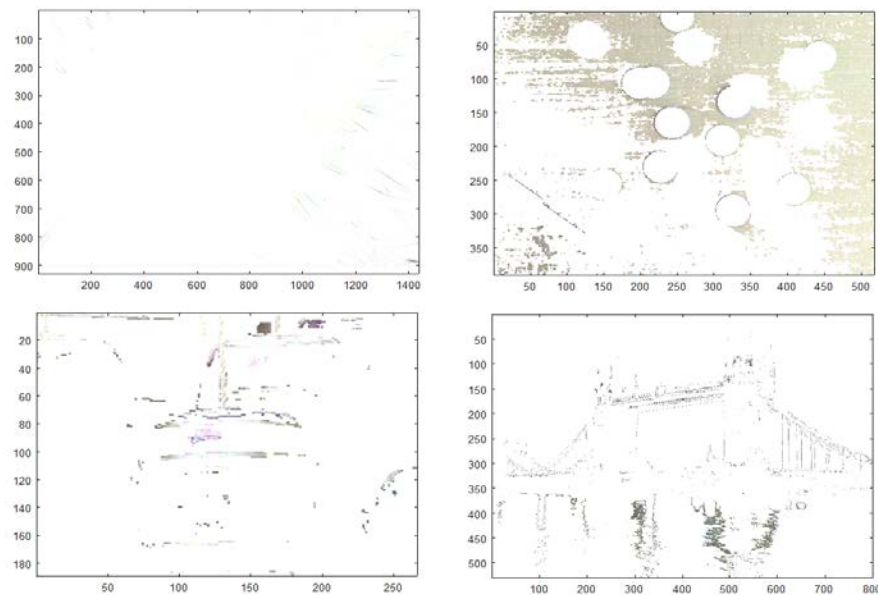The color detection of the pastel color in the above images is shown below in figure (4-10).

Figure 4- 10: color detected (pastel)

Below figure (4-11) shows the most dominant colors calculated from the images.
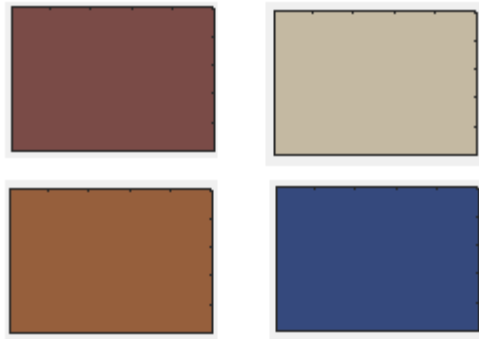

Figure 4- 11: Dominant colors

Figure (4-12),(4-12) shows the conversion results of the images from RGB to HSV and RGB to HSI color models.
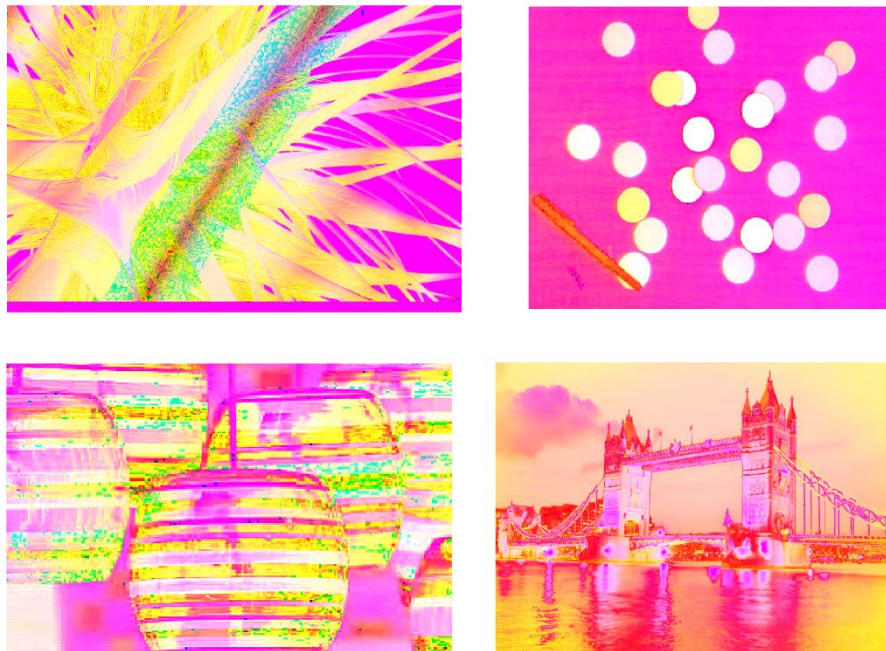

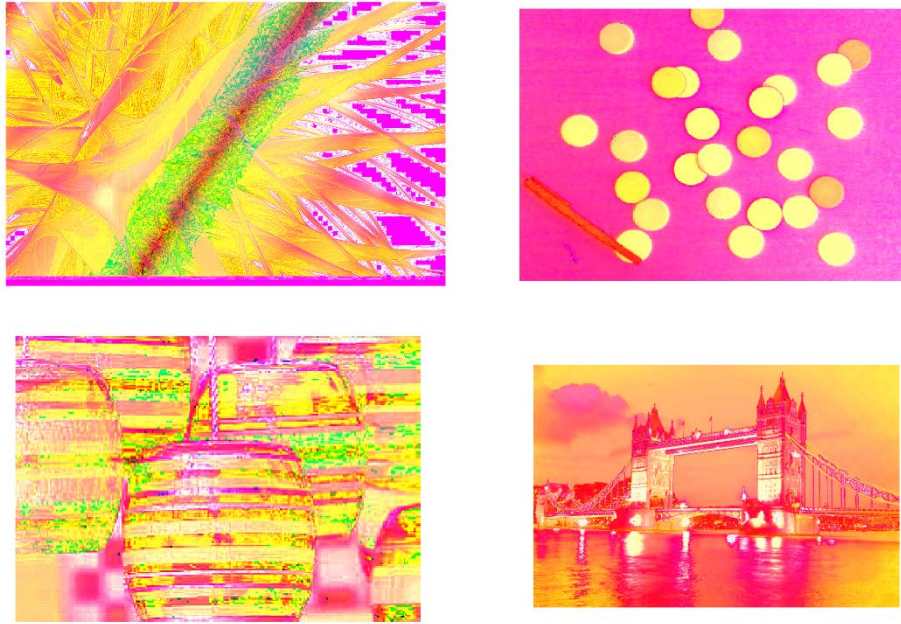
Figure 4- 12: Converted images (HSV)

Figure 4- 13: Converted images (HSI)

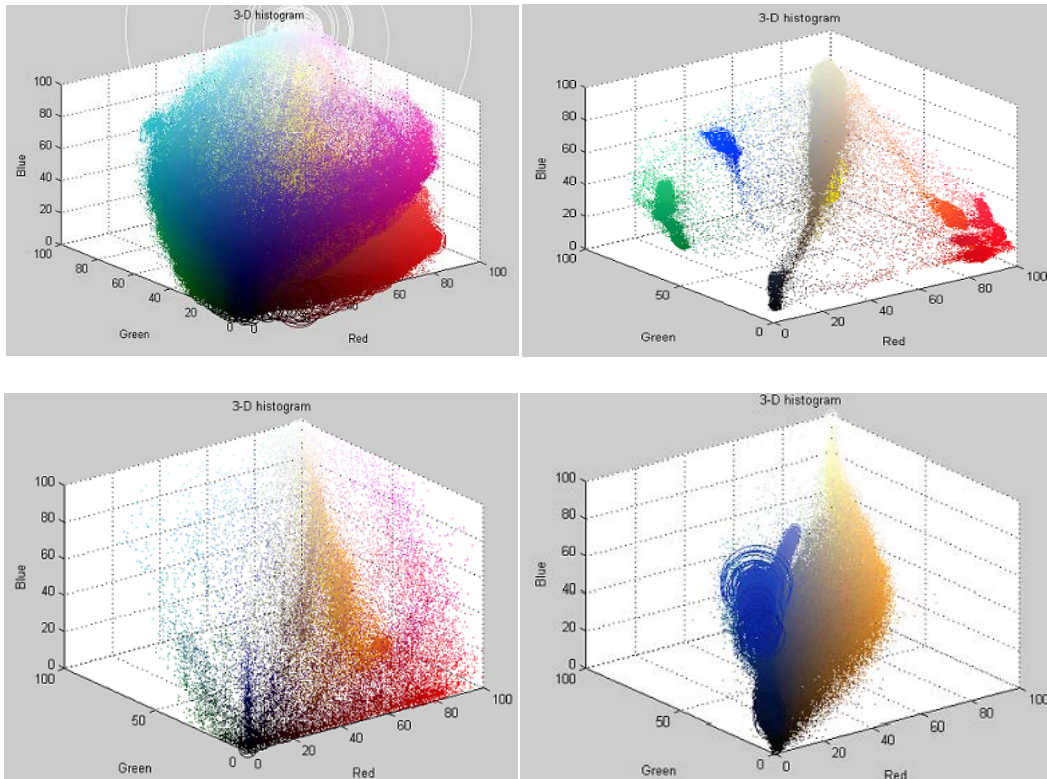Figure(4-14) show the 3D histogram for four samples

Figure 4- 14: 3D Histogram results

As seen by Table 4-1, there are different color models should be visualized by advice for understanding and carrying out the action specified by the present of this color.

Table 4- 1 : Comparison between RGB, HIS, and HSV

Model	Advantage	Disadvantages
RGB	- No transformation required to display information on the screen - Used in video display because its additive property.	- Difficult to determine specific color in RGB model.
HSI	- The chrominance components (H & S) are associated with the way that humans perceive, it became perfect for image processing applications. - The (Hue) component can be used for performing segmentation process, rather the three component which fast the algorithm. - Separate the chromatic from achromatic value.	- Doesn't supply with inside for color manipulation. - Not uniform.
HSV	- Good compatibility with human intuition. - Possibility of preferring one component to other.	- Undefined achromatic hue points at sensitive to value deviation of RGB and stability of hue, because of the angular nature of the feature.