Name : Houhao Liang

Part-1 : Linear Interpolation

1) Insert your linear interpolated test image(hope.jpg) here:

2) Display the map/plot of all the 3 training images here:

3) Post close-up of any artifacts you came across.

Crayons:

Tony:

4) Average_per_pixel error and Max_pixel_error for each of 3 training images :

Image	Average_per_pixel_error	Max_pixel_error
Crayons	47.86914236111111	678
Tony	14.996192708333334	482
Iceberg	43.93339164101129	498

Part-2 : Freeman Method

5) Insert your Freeman Method test image(hope.jpg) here:

6) Display the map/plot of all the 3 training images here:

7) Post close-up of any artifacts you came across.

Crayons:

Tony:

Iceberg:

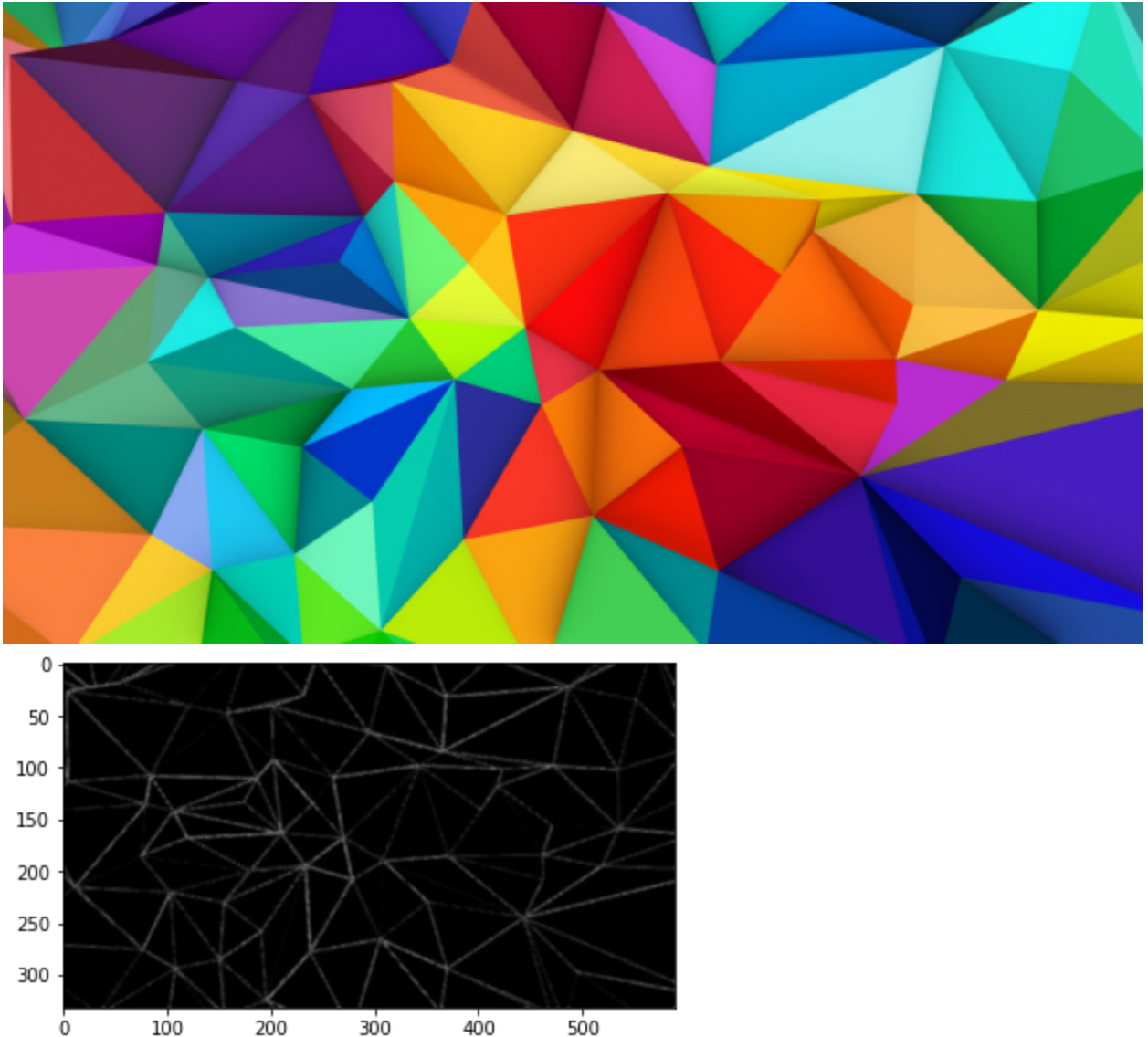8) Average_per_pixel error and Max_pixel_error for each of 3 training images :

Image	Average_per_pixel_error	Max_pixel_error
Crayons	49.50285763888889	715
Tony	14.552795833333333	681
Iceberg	45.97697779643624	718

Part-3 : Images of your choice

1) Post 2 images your choice here and the corresponding error maps of your outputs with the Freeman method.
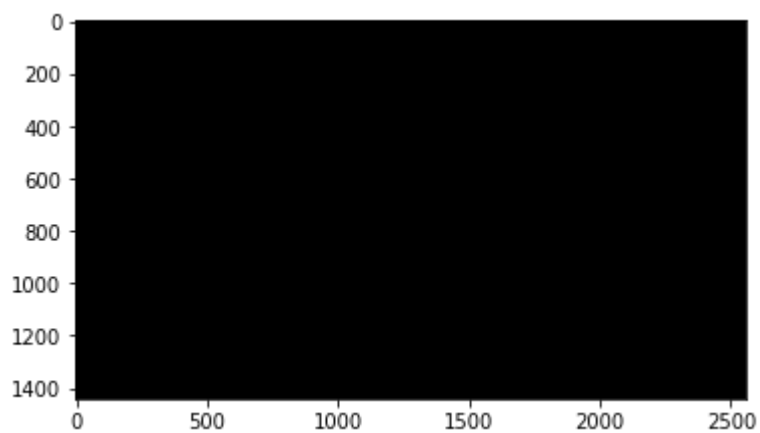
2) Any image that breaks the method and why do you think so?

The second colorful image breaks the method and shows some artifacts. For the first plain image, the error almost is zero.

We can find the artifacts on the interface of two different colors. In other words, it is the pattern of alternating colors along the edge. I think the reason is the abrupt or sudden changes of intensities over a number of neighboring pixels, which means the improper averaging of neighboring color values across edges. For the plain image, there is no changes and the result is much better. (Refer to *Image Demosaicing*, Ruiwen Zhen and Robert L. Stevenson)

And I have also found some color errors on the crayons and iceberg image. It means the color is not identical as that in the original image. It actually happens due to inconsistency among the three color planes and then cause large intensity changes.

Part-4 : Bonus

Post any extra credit details/images/references used here.