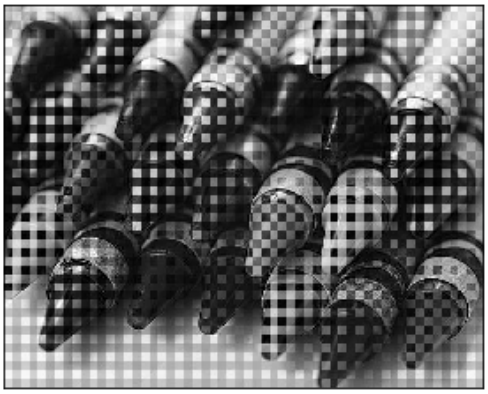
**Name :** Yuxuan Zhou

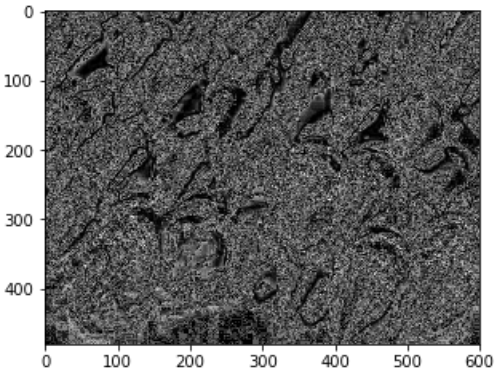
**Part-1 : Linear Interpolation**

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

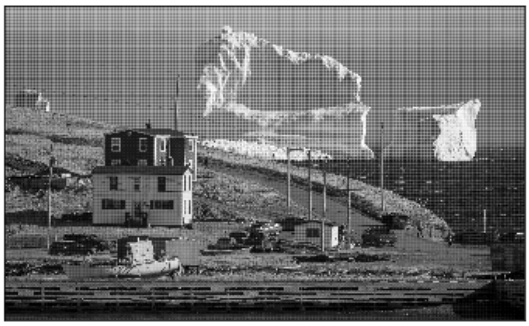
2) Display the map/plot of all the 3 training images here:

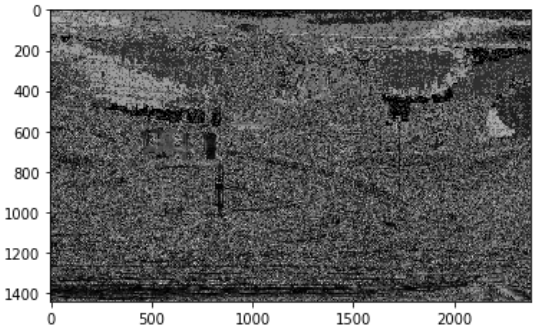
<1> crayons.bmp crayons.jpg(original) crayons.jpg(solution) crayons.jpg(error)





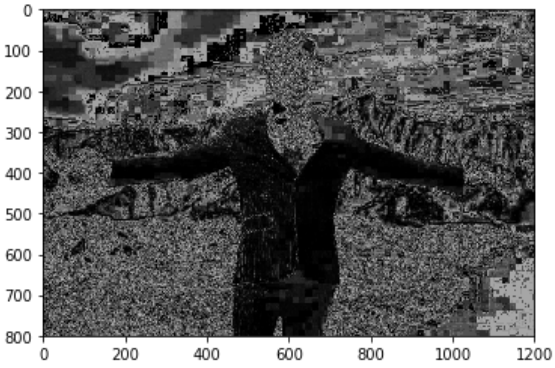
<2> iceberg.bmp iceberg.jpg(original) iceberg.jpg(solution) iceberg.jpg(error)




<3> tony.bmp tony.jpg(original) tony.jpg(solution) tony.jpg(error)




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

1.Color artifacts – Color moire – Purple fringing from microlenses
2.In-camera processing – oversharpening can produce halos
3.Blooming– CCD charge overflowing into neighboring pixels

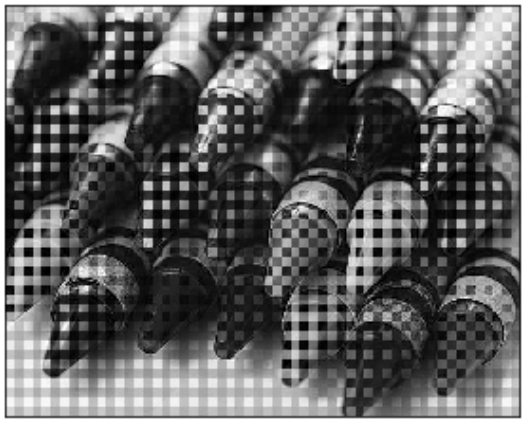
4) Average_per_pixel error and Max_pixel_error for each of 3 training images :

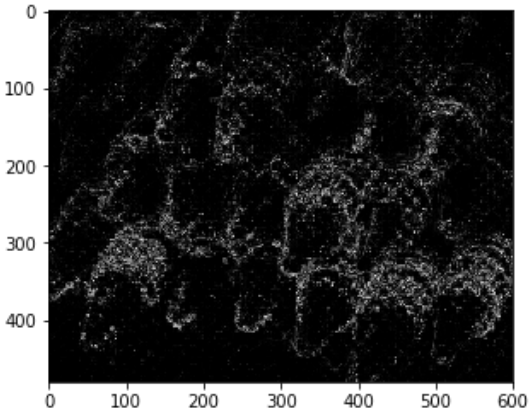
| Image | Average_per_pixel_error | Max_pixel_error |
|---|---|---|
| Crayons | 98.55387268518518 | 94.23556249599986 |
| Tony | 93.50639027777778 | 107.93315783004013 |
| Iceberg | 100.50491436545698 | 97.2682309159478 |

**Part-2 : Freeman Method**

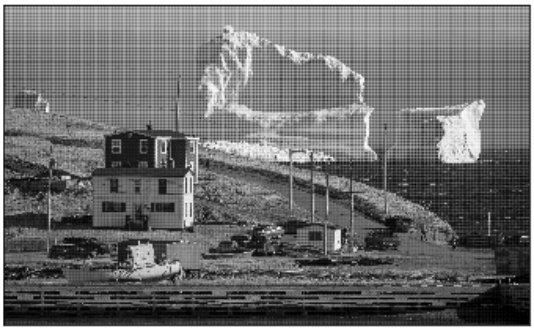
5) Insert your Freeman Method test image(hope.jpg) here:

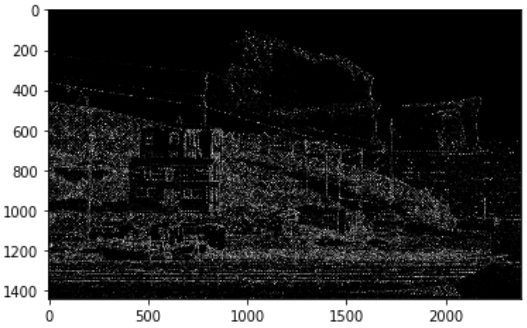
6) Display the map/plot of all the 3 training images here:
<1> crayons.bmp crayons.jpg(original) crayons.jpg(solution) crayons.jpg(error)





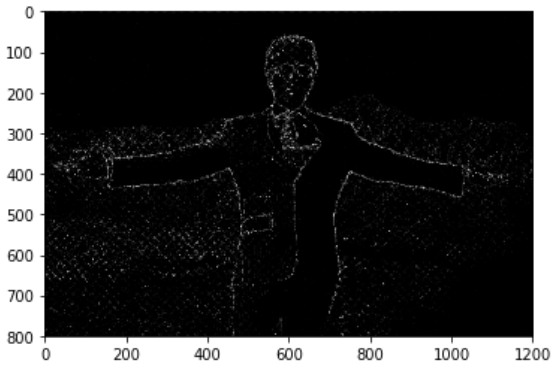

<2> iceberg.bmp iceberg.jpg(original) iceberg.jpg(solution) iceberg.jpg(error)



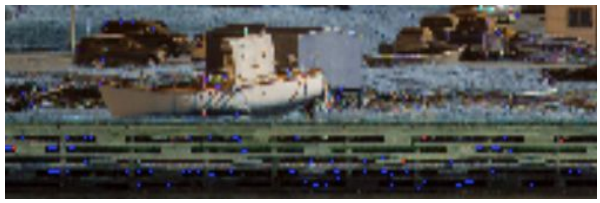

<3> tony.bmp tony.jpg(original) tony.jpg(solution) tony.jpg(error)




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



1.Color artifacts – Color moire – Purple fringing from microlenses
2.Blooming– CCD charge overflowing into neighboring pixels
3.Compression – JPEG artifacts, blocking

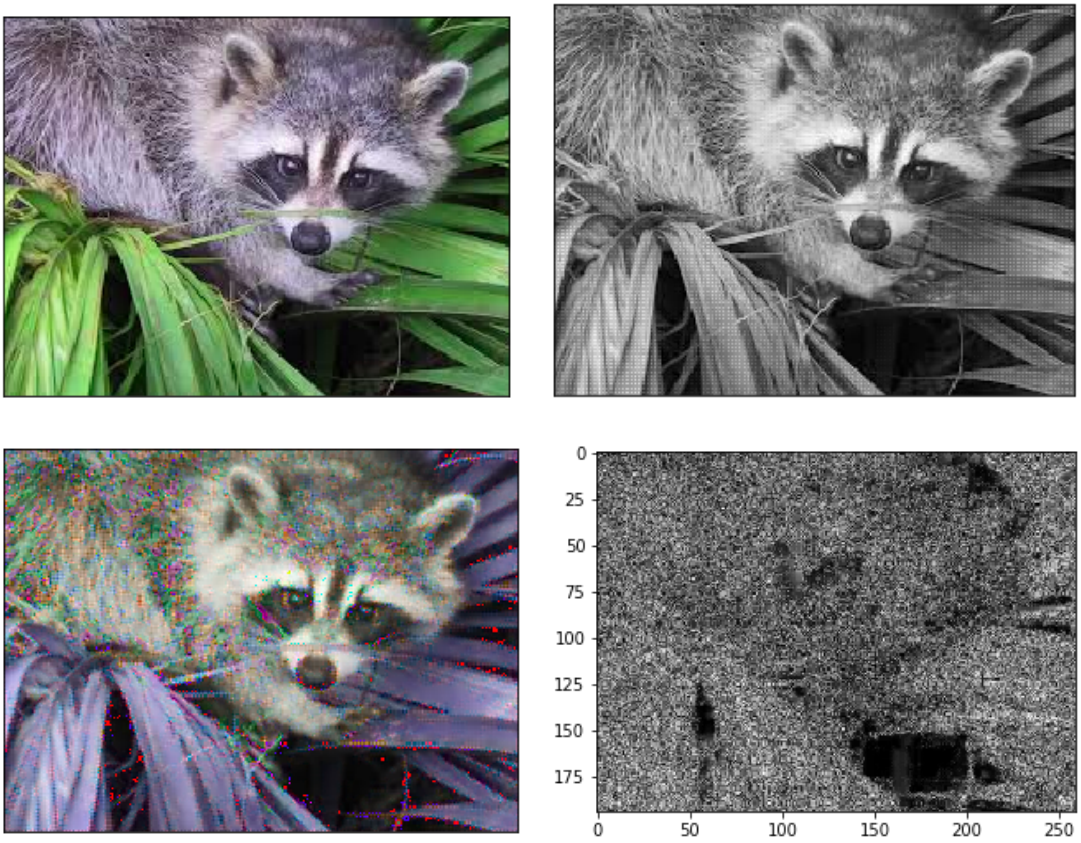
8) Average_per_pixel error and Max_pixel_error for each of 3 training images :

| Image | Average_per_pixel_error | Max_pixel_error |
|---|---|---|
| Crayons | 49.18474722222222 | 99.29949578725345 |
| Tony | 72.15180208333334 | 111.97364042226427 |
| Iceberg | 63.144582050564416 | 107.31954378498835 |

**Part-3 : Images of your choice**

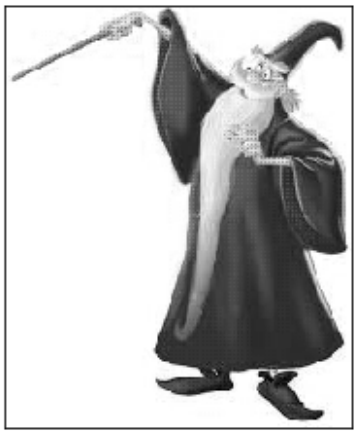
1) Post 2 images your choice here and the corresponding error maps of your outputs with the Freeman method.

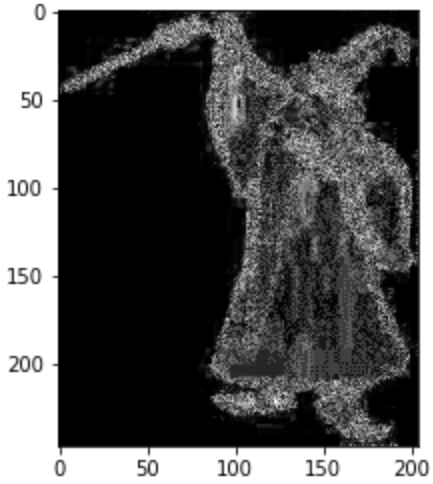
<1> bear.bmp bear.jpg(original) bear.jpg(solution) bear.jpg(error)




The average per-pixel error for bear is: 136.54683623240325
The maximum per-pixel error for bear is: 107.16041669433402

<2> wizard.bmp wizard.jpg(original) wizard.jpg(solution) wizard.jpg(error)






The average per-pixel error for wizard is: 59.585073165568524
The maximum per-pixel error for wizard is: 96.77009796399219

2) Any image that breaks the method and why do you think so?

Both of them have the artifacts:
1.Compression – JPEG artifacts, blocking
2.Color artifacts – Color moire – Purple fringing from microlenses
3.Blooming– CCD charge overflowing into neighboring pixels


The bear image's average error is different from the previous result.The average per-pixel error for bear is: 136.54683623240325,which is much bigger than any pictures with either method.

I guess first it was because this one is from JPEG and I convert it into JPG.
Second,the size of this photo is much more than the training photos.
Finally, when it comes into a person who is in black and white, the error usually becomes low and when the picture is in deep color and no black and white, it usually ends up with high errors

**Part-4 : Bonus**

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