Digital Image Processing

HY-371

Assignment 1-Image Resolution Manipulation

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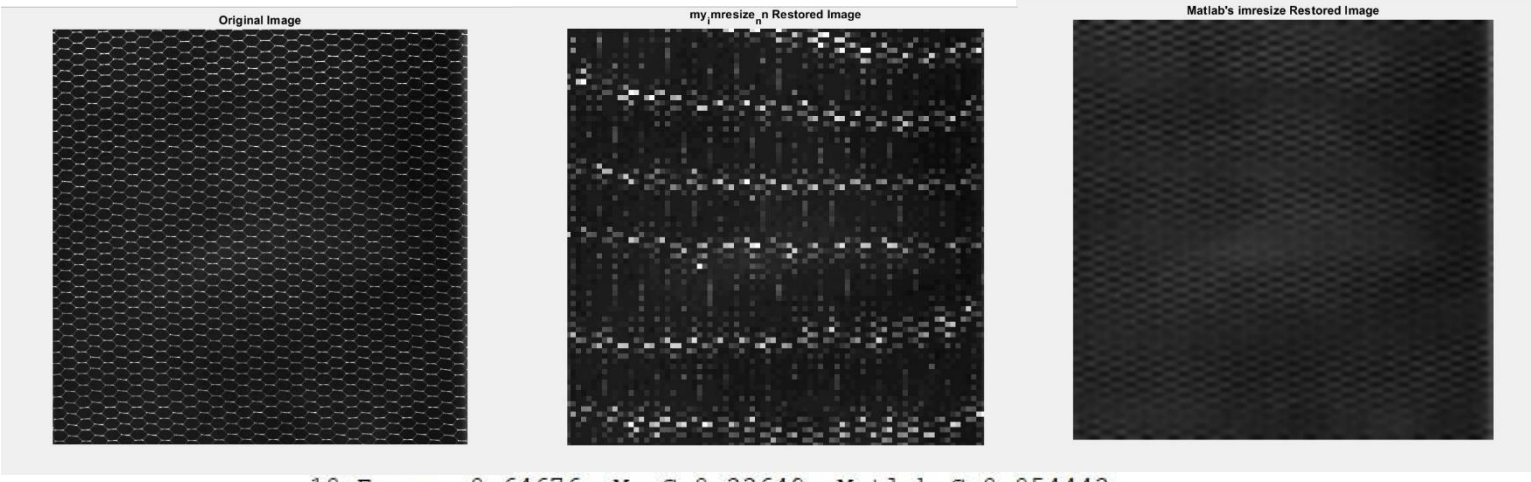
1. Sub-sample and up-sample using Nearest Neighbor

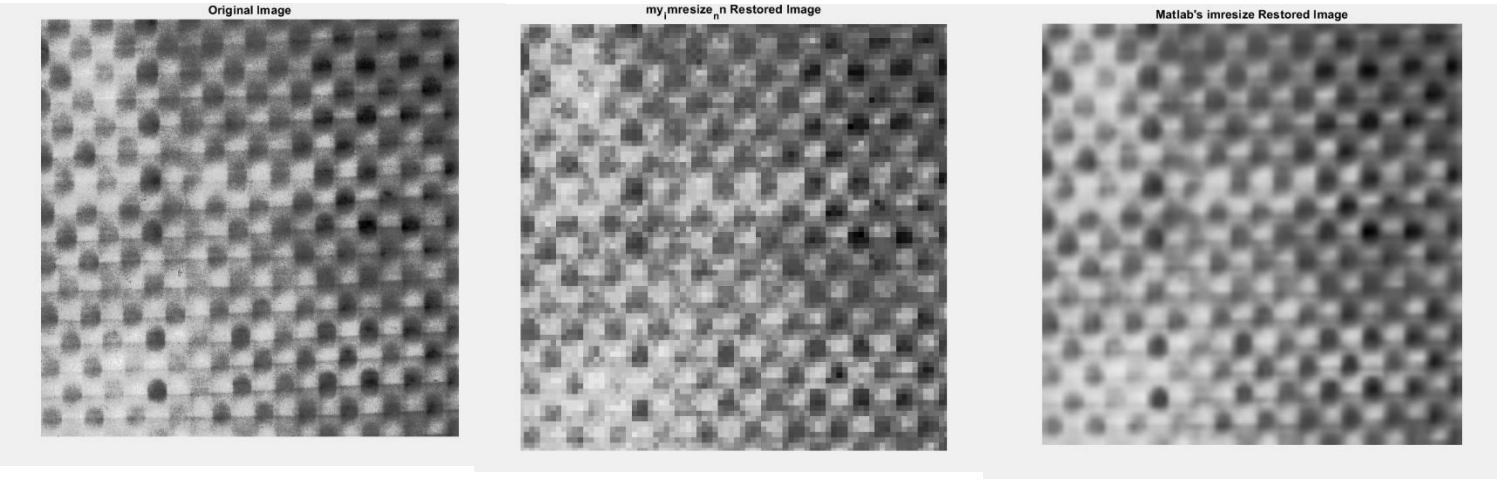
(c) As we can understand from the Mean Approximation Error (E), in some cases the result is really close to each other, but in some other cases the difference is quite obvious and noticeable. In most cases Matlab's *imresize* function is closer to the original image.
We notice that G value of *imresize* function is quite significantly lower than *my_imresize_nn* function and that's why the transitions in the image are smoother and generally the image is closest to the original one.
Finally the Mean Approximation Error increases when the difference between G value of the *my_imresize_nn* image and the *imresize* are increase too and decreases when the difference of the above decrease too.

Examples:
1) Image number 10



10.Error= 0.64676. My G=0.33649. Matlab G=0.054443

2)Image number 21

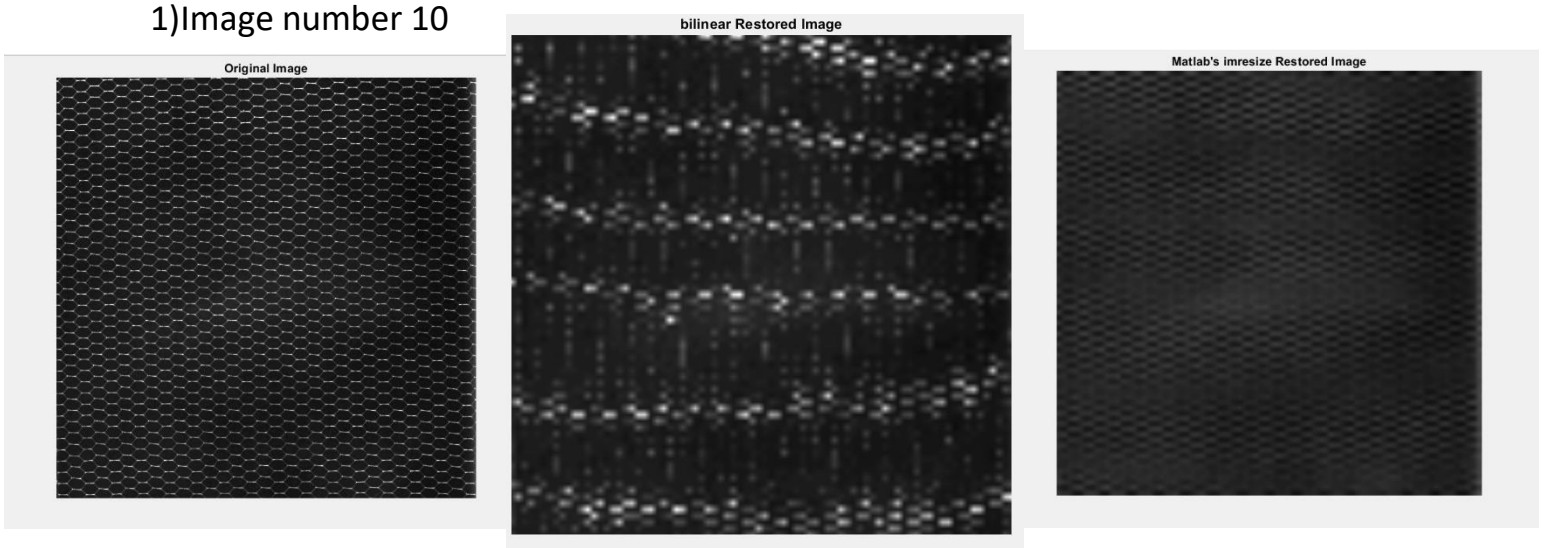


21.Error= 0.18818. My G=0.070803. Matlab G=0.02018

2.Sub-sample using Nearest Neighbor and up-scale using Bi-linear Interpolation

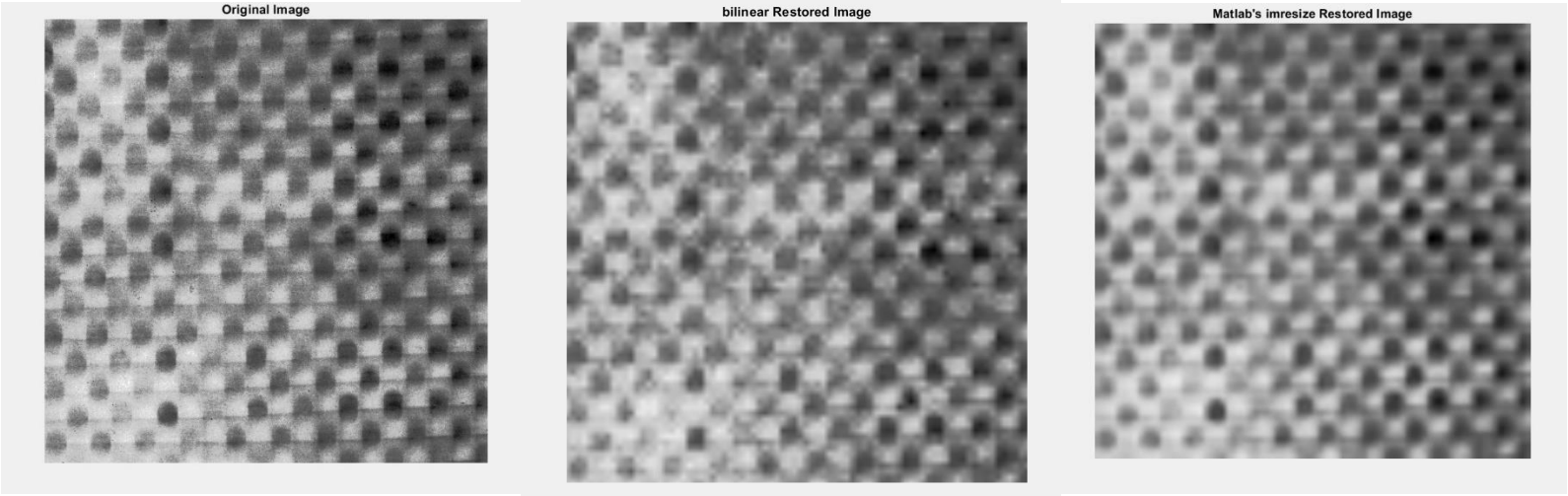
(c)As we can notice, this method is better than the previous one because the Mean Approximation Error is smaller compared to the previous method. Also, we notice again that when we compare the difference between the G values again, whenever the difference is a small number, then the Error is also a small number. We will compare the same pictures again as an example.

1)Image number 10



10.Error= 0.5143. My G=0.10997. Matlab G=0.054443

2)Image number 21

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21.Error= 0.16115. My G=0.022648. Matlab G=0.02018
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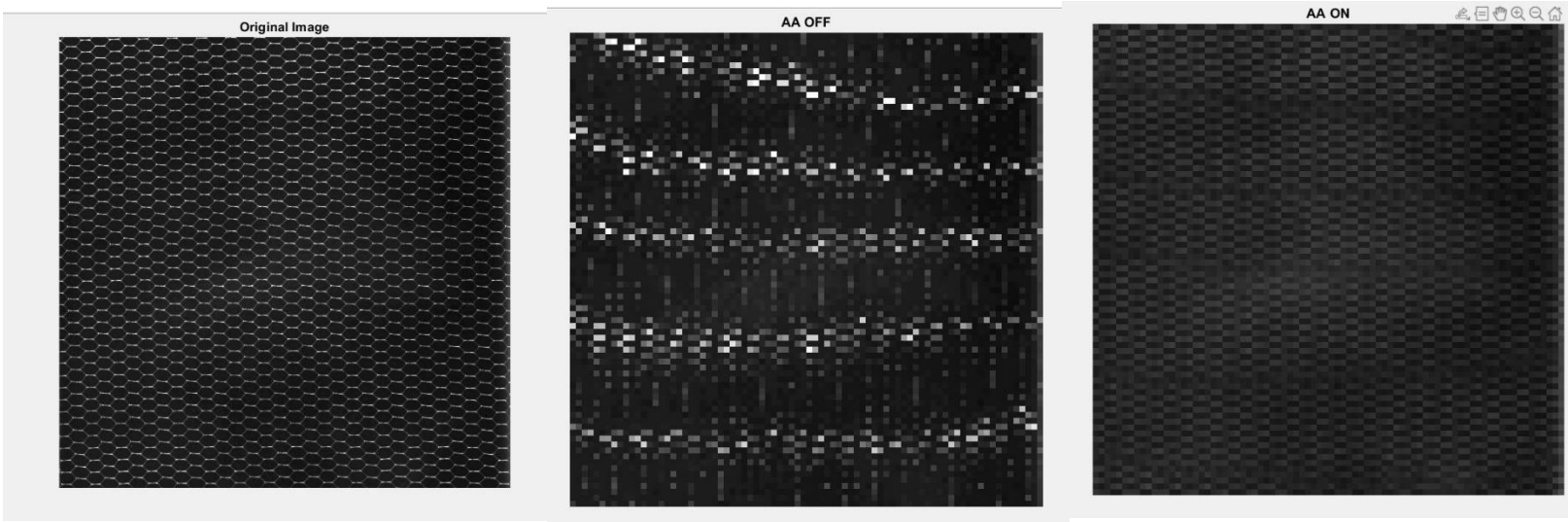
4. We can see that the pictures with more texture, when we don't use the Antialiasing option, then we can notice that artifacts are created in the picture. We can see those result in the following picture:

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10.Error of Antialiasing On with Original Image= 0.74673
Error of Antialiasing Off with Original Image=1.0342
Original image G=0.6752
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