Image Processing

Assignment 2

Members:

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Files:

1. Addition.m
2. Subtract.m
3. Resolution.m
4. Average.m
5. Solution1.m
6. Solution2.m
7. Solution3.m
8. Images

Solutions and Observations:

Question 1:
1. The original image named "image.jpg" was imported in 8 bits(256 levels).
2. Further dividing the gray levels as follows:
   1. (Divide by 4 grayimage)*4   ------> for 64 gray levels(6 bits)   image4
   2. (Divide by 16 grayimage)*16   ------> for 16 gray levels(4 bits)   image16
   3. (Divide by 32 grayimage)*32 ------> for 8 gray levels(3 bits)   image32
   4. (Divide by 64 grayimage)*64   ------> for 4 gray levels(2 bits)   image64
   5. (Divide by 128 grayimage)*128 ------> for 2 gray levels(1 bits)   image128
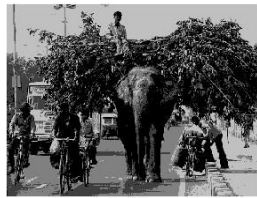
It is has been realized (both subjectively and objectively) that the quality of a gray-level image is dramatically affected by its gray-level resolution. In other words, increasing the number of bits per pixel has a great effect in improving the quality of gray-level images. This is because that a higher number of gray levels would give a smooth transition along the details of the image and hence improving its quality to the human eye.

Question 2:
Image resolution is the degree of discernible detail of an image.The spatial resolution of an image principally determine by Sampling..Zooming and shrinking are the operations of oversampling and undersampling a digital image, respectively.

      1.The original image named "image.jpg" was imported in variable name image.

      2.RGB image was converted to gray level image   ------->   grayImage

      3.Sampled image using resolution function i.e. **deleting alternate rows and columns** -------->newImage

Question 3:
The main aim in image sharpening is to highlight fine detail in the image. It increases   the contrast around the edges of object to increase the image's definition i.e., enhance high frequency components.

Common approach to produce a sharp image-

   I. Taking a blurred version of the original image, subtracting it from the original image and adding the result of subtraction back to original image.

        1.The original image named "image.jpg" was imported in variable name image.

        2.RGB image was converted to gray level image   ------->grayImage

        3.The grayImage is blurred using averaging filter   -------> blurredImage.

        4. blurredImage subtracted from original grayImage   ------->subtractedImage

        5. addition of subtractedImage and the original grayImage ------->sharpenedImage