Digital Image Processing 2021-2 Exam. Check: 이용반

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1. Explain digital image processing.

It refers to all fields related to Images that process digitaled image or image information using a computer

2. Draw output image based on Input Image using Mosaic sized 2*2 mask.

(Input Image) (Output Image)

0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	100	10	10	10	0	0
0	0	10	10	100	10	0	0
0	0	10	10	10	100	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	25	27.5	5	5	2.5	0	0
0	27.5	32.5	32.5	32.5	5	0	0
0	5	10	32.5	55	27.5	0	0
0	2.5	5	5	27.5	25	0	0
0	0	0	0	0	0	0	0

3. Input Image-A will imitate Image-B that has each pixel with 3 bits(0-7 intensity) and 4X4 image resolution.

A) Calculate the precedure and *B)* draw *output images and histogram of those*.

C) Explain meaning of them.

Image-A

0	1	2	3
0	1	2	3
4	5	6	7
4	5	6	7

Image-B

6	6	4	5
6	6	4	5
7	7	7	5
7	7	7	5

Output image

0	4	4	5
0	4	4	5
6	6	6	7
6	6	6	7

ref.) 7*(1/16)=0.4, 7*(2/16)=0.9, 7*(3/16)=1.3, 7*(4/16)=1.8,
7*(5/16)=2.2, 7*(6/16)=2.6, 7*(7/16)=3.1, 7*(8/16)=3.5,
7*(9/16)=3.9, 7*(10/16)=4.4, 7*(11/16)=4.8, 7*(12/16)=5.3,
7*(13/16)=5.7, 7*(14/16)=6.1, 7*(15/16)=6.6

C)

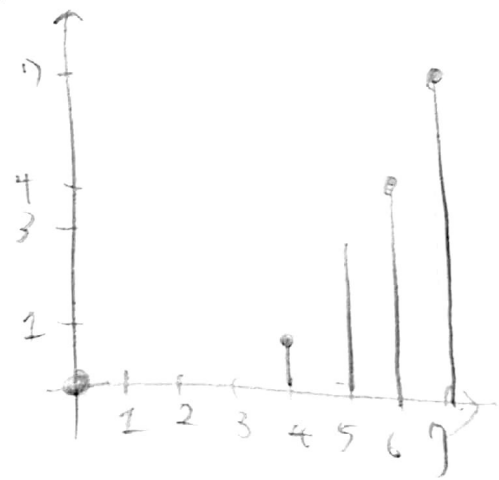
A: B's histogram — the original is Image-B so we should see histogram of it

intensity	frequency	accumulate first	normalization	new intensity
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	2	2	$\frac{2}{16}$	$\frac{2}{16}\times 7 = 0.9 \doteq 1$
5	4	6	$\frac{1}{16}$	$\frac{6}{16}\times 7 = 2.6 \doteq 3$
6	4	10	$\frac{10}{16}$	$\frac{10}{16}\times 7 \doteq 4.4 \doteq 4$
7	6	16	$\frac{16}{16}$	$\frac{16}{16}\times 7 = 7$

C. we have to copy (imitate) B to A so we should reverse intensity

intensity	new intensity
0	0
1	0
2	0
3	0
4	1
5	3
6	4
7	7

B)



reverse

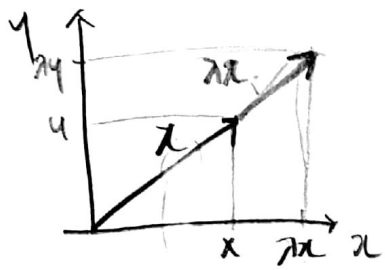
0	0
1	4
2	4
3	5
4	6
5	6
6	6
7	7

4. We have 3,000 data with 2 dimension.

A) Explain Eigen value and Eigen Vector and draw graph of them. *B)* Suggest any idea when you can reduce dimension.

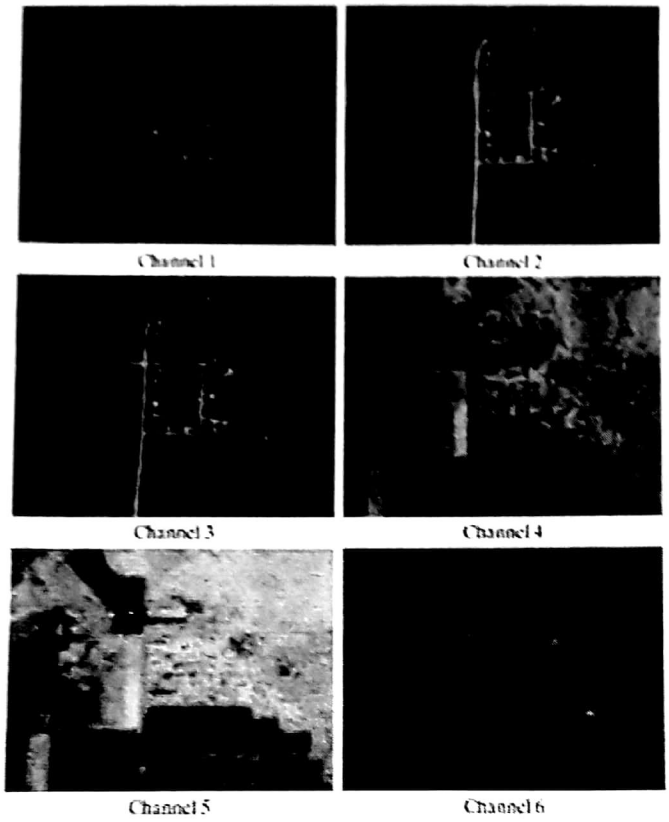
A. Eigen vector is a vector whose magnitude changes but its direction does not change.

Eigen value is a magnitude value that converts size



B. If we set Eigen vector, it will be one-dimensional if we only collect the data in that direction

5. We have six satellite images of size 512*512, corresponding to six spectral bands: from visible blue to thermal infrared. Suggest a method that improve contrast detail of image.



The contrast of satellite image is low

I think histogram equalization is good method for improving detailing of image.

6. Explain your role in the final team project including team name and number.

team #2 Franko

I'm team leader, and presenter.

I almost led the communication between Korean students and French students

All of the team member participated for report, project and ppts.