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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Computer Vision (course)

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Course outline

How does an NPTEL online course work? ()

Week 0 ()

Week 1 : ()

Lecture 01 : Fundamentals of Image Processing Part I (unit?unit=17&lesson=18)

Week 1 : Assignment 1

Assignment not submitted **Due date: 2023-08-09, 23:59 IST.**

1) ***2 points***

Consider the Direct Linear Transform (DLT) algorithm for a point correspondence $x_i' \leftrightarrow x_i$ which involves the following equation using homogeneous coordinate representation of points x_i' and x_i in the transformed and original 2-D projective space where H is a projective transformation.

$x' \sim Hx$

Choose the correct option from the following:

a) Vectors x' and Hx may have similar magnitude but different direction.

b) Vectors x' and Hx may not be equal. They have similar direction but different magnitude.

c) Vectors x' and Hx may be equal. They have similar direction and magnitude.

d) Cross product of x' and Hx is a zero vector.

- [ ] a)
- [ ] b)
- [ ] c)
- [ ] d)

FOR QUESTIONS 2 AND 3

Consider a 3-bit grey scale image with dimension 256×32.

2) ***2 points***

What will be the range of values in its X-axis?

a) 0 to 255

b) 1 to 256

c) 0 to 15

d) 0 to 7

- a)
- b)
- c)
- d)

3) ***2 points***

What will be the minimum and maximum range of values in its Y-axis?

a) 32 and 512

b) 1024 and 8192

c) 0 and 16

d) 32 and 128

- a)
- b)
- c)
- d)

4) ***2 points***

An image taken using a camera can be enhanced different techniques. Suppose, a software is developed which can detect if an image has been enhanced or not with 95% accuracy. A survey is done and it is found that 80% of all images are enhanced. If the software predicts that an image is enhanced, what is the probability that the image is actually enhanced.

a) 0.95

b) 0.987

c) 0.2

d) 0.77

- a)
- b)
- c)
- d)

5) ***2***

Consider two images I_1 and I_2 with dimensions 16×2 and 4×16 respectively. I_1 consists of 16 background pixels and I_2 consists of 4 background pixels. Rest pixels are foreground pixels. Suppose, a pixel is selected at random and is found to be background pixel. What is the probability that the selected pixel is from image I_2?

a) 0.125

b) 0.2

c) 0.6

d) 0.33

- a)
- b)
- c)
- d)

6) ***2 points***

Consider the following 3-bit grey scale image

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

What of the following can be the value when vertical Prewitt operator and horizontal Prewitt operator are applied on the orange colored pixel?

a) 0 and 2

b) 0 and 10

c) 8 and -2

d) 2 and 10

- a)
- b)
- c)
- d)

7) ***2 points***

Consider the following 3-bit grey scale image

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

What of the following can be the value when vertical Snobel operator and horizontal Snobel operator are applied on the orange colored pixel?

a) 0 and 2

b) 7 and 9

c) −5 and 5

d) 5 and 5

- a)
- b)
- c)
- d)

8) ***2 points***

Consider the following 3-bit grey scale image

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

When contrast enhancement using histogram equalization is used, to which intensity is the intensity 5 mapped to?

a) 6

b) 5

c) 4

d) 3

- a)
- b)
- c)
- d)

9) ***2 points***

Consider the following 3-bit grey scale image

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

When contrast enhancement using histogram equalization is used, to which intensity is the intensity 3 mapped to?

a) 6

b) 5

c) 4

d) 3

- a)
- b)
- c)
- d)

10) ***2 points***

A continuous time signal is given by $x(t) = e^{-2t}u(t)$, its fourier transform $X(j\omega)$ is given by

a) $1/(2 + j\omega)$

b) $1/(3 + j\omega)$

c) $1/(1 + j\omega)$

d) $1/(4 + j\omega)$

- a)
- b)
- c)
- d)

You may submit any number of times before the due date. The final submission will be considered for grading.

Submit Answers