

MARCH 2024

9

Saturday

069-297 / Week 10



LIC

भारतीय जीवन बीमा निगम  
LIFE INSURANCE CORPORATION OF INDIA

# Edge Detection

①. point Detection

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & -8 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

line Hor

$$\begin{bmatrix} -1 & -1 & -1 \\ 2 & 2 & 2 \\ -1 & -1 & -1 \end{bmatrix}$$

45°

$$\begin{bmatrix} 2 & -1 & -1 \\ -1 & 2 & -1 \\ -1 & -1 & 2 \end{bmatrix}$$

ver

$$\begin{bmatrix} -1 & 2 & -1 \\ -1 & 2 & -1 \\ 2 & -1 & -1 \end{bmatrix}$$

-45°

$$\begin{bmatrix} -1 & -1 & 2 \\ -1 & 2 & -1 \\ 2 & -1 & -1 \end{bmatrix}$$

10 Sunday

Robert

Hor

$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

29-25

ver

$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{bmatrix}$$

28-26

MARCH	2024
M T W T F S S	
	1 2 3
4 5 6 7 8 9 10	
11 12 13 14 15 16 17	
18 19 20 21 22 23 24	
25 26 27 28 29 30 31	

NOTES



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# LIC

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MARCH 2024

Monday

11

071-295 / Week 11

pre with  
hor

$$\begin{bmatrix} -1 & -1 & -1 \\ 0 & 0 & 0 \\ 1 & 1 & 1 \end{bmatrix} \quad \text{ver} \quad \begin{bmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{bmatrix}$$

sobel  
hor

$$\begin{bmatrix} -1 & -2 & -1 \\ 0 & 0 & 0 \\ 1 & 2 & 1 \end{bmatrix} \quad \text{ver} \quad \begin{bmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{bmatrix}$$

Average filter /  
box filter

$$\begin{bmatrix} 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \end{bmatrix}$$

Min, Max, Median.



HSI

RGB

$$\text{Intensity} = (R + G + B) / 3$$

$$\text{saturation} = 1 - \frac{3}{R + G + B} (\min(R, G, B))$$

$$H_{\text{eu}} = \cos^{-1} \left[ \frac{Y_2 [(R - G) + (R - B)]}{\sqrt{(R - G)^2 + (R - B)^2 + (G - B)^2}} \right]$$

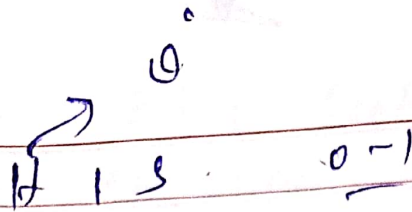
NOTES

APRIL							2024
M	T	W	T	F	S	S	
1	2	3	4	5	6	7	
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	
29	30						



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$$B = P(1 - S)$$

$$R = P \left( 1 + \frac{S \cos H}{\cos(60^\circ - H)} \right)$$

$$G = 3P - (R + B)$$

opening  $\Rightarrow$  Error  $\rightarrow$  Result  
Dilation.

clowny  $\Rightarrow$  Dilation  $\rightarrow$  Result  
Error.

Error

8F - 1

$$\begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 2 & 3 \\ 1 & 4 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

$\min(0, 0, 0, 5) \Rightarrow \text{error} \Rightarrow \begin{bmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

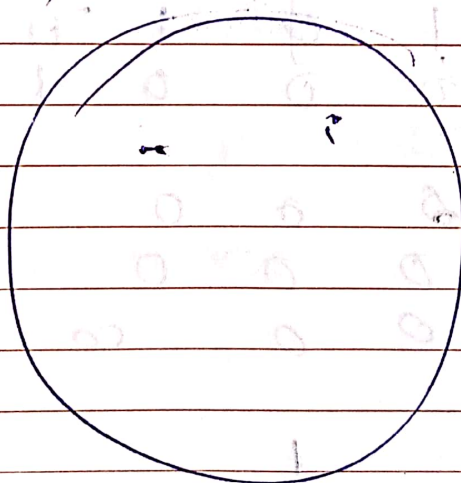
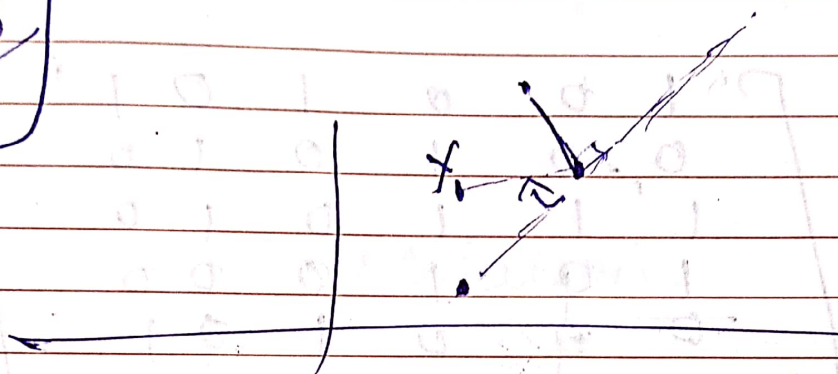
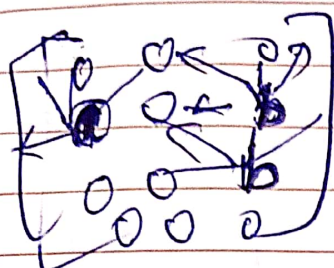
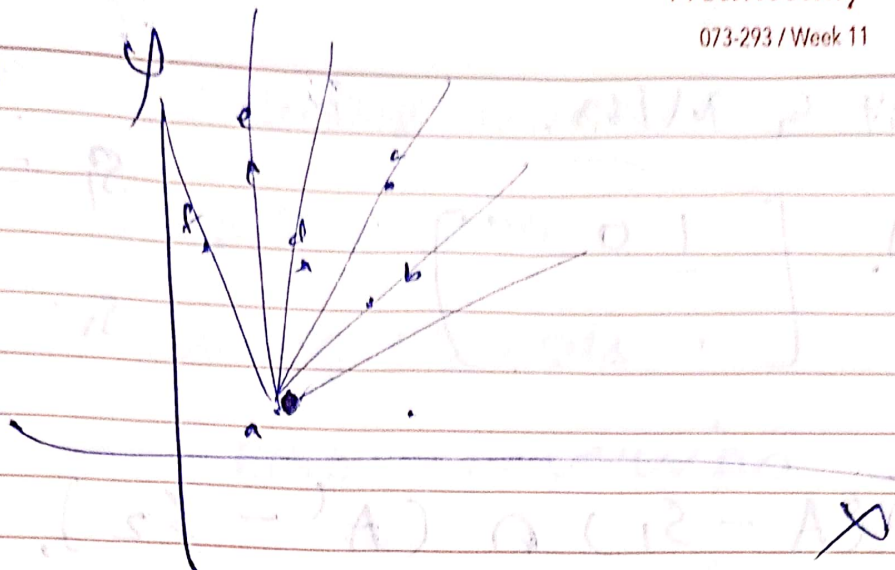
max ( ) Dilation

$$\begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & 1 \end{bmatrix}$$

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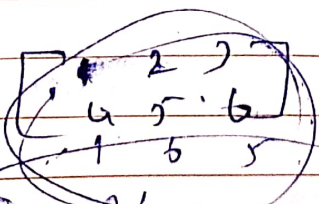
convex hull



Area = max  
 cor - min

hist ex:

NOTES



No. of pixels =  $m \times n$   
 pixel subtr:

After replace

$P(1) = 2/9$

$P(2)$

$P(3)$

$\leq$  Hist of  $P(4)$   $P(5)$   $P(6)$

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29	30					



MARCH 2024

14 Thursday  
074-292 / Week 11

1/27 4 MIN.

$$A = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$$

$$S_1 = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & 1 \end{bmatrix}$$

$$S_2 = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

4  $(A - S_1) \cap (A^T - S_2),$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & & & & & \\ & & & & & 1 \end{bmatrix}$$

MARCH 2024						
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MARCH 2024

Friday

15

075-291 / Week 11

A.C.

## Image Processing

→ Edge Detection

→ Filtering Methods

→ HSI, RGB conversion

→ opening and closing morphological operations

→ convex Hull

→ Histogram Equalisation

→ Hit &amp; Miss operations

→ Focal Length, Image Distance

→ Threshold operations

→ GLCM

→ Connected components

→ Image Segmentation

NOTES

→ Edge Detector methods

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