

[Introduction]

* Intensity Values ✓

* Pixel ✓

(0-255)

51	32	90
139	75	83
2	50	17

Analog View/Image: Seeing anything through ~~Analog~~ Eyes.

Digital Image: If we capture a picture through camera

► Process to turn Analog to Digital:

* [Quantization and Sampling]

$$I(M, N) \equiv \begin{bmatrix} M \Rightarrow \text{Row} \\ N \Rightarrow \text{Column} \end{bmatrix}$$

Grayscale Images

: Black and White Images

extensions: .jpg .gif

.jpeg .png

For grayscale → 8 different bits required

$$2^8 = 256 \text{ [0-255]}$$

→ .ppm ← (gs)

→ white increases

↑ GIMP

.ppm → $\begin{bmatrix} 51 & 32 & 90 \end{bmatrix}$
R G B

.ppm (for color)

• Type of Processing

- a) low level [I/P: image
O/P: image]
- b) mid level [I/P: image
O/P: features]
- c) high level [I/P:
O/P:]

35	39	43
45	71	73
81	7	24

3x3

41	45	47
49	76	78
86	12	29

(Gaussian Noise)

• Noises: Fluctuations in Images.

↳ Types

- Gaussian Noises
- Salt and Pepper Noise →

↓ Additive of Noise

213	87	224
93	54	219
221	217	224

Dark turns Light

Light turns Dark

4	87	7
93	54	219
7	8	224

PSNR- Peak Signal to Noise Ratio

↳ For judging the quality of an image.

Mid level: I/P: Image

O/P: Features → [Edge detection]

High level: I/P: Feature

O/P: Understanding.

[I/P → Datasets would be processed with various ML algo and give us some insights]

→ SR → Image Processing 3/Aug/22

Image: Two dimensional light intensity function $f(x, y)$

x and y → spatial co-ordinate and the amplitude of f at any point.

Pixel: single value of whole matrix.

Applications of Image Processing:

Processes:

- Image Acquisition: Acquire readable image.
- Image enhancement: Quality improvement
- Segmentation: Feature Extraction by Division
- Color image processing:
- Morphological processing:
- Representation and Description:
- Recognition and Interpretation:

Algorithms Used

Clustering: ~~Unsupervised~~ Unsupervised Learning Algo that gathers similar data together.

$$\text{Color}(i, j) = (R(i, j), G(i, j), B(i, j))$$

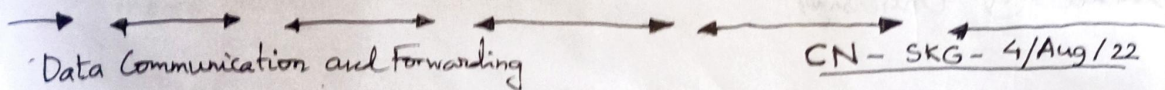
✓ K-means , ✓ Fuzzy

② Lena.jpeg \rightarrow all combos for grayscale image available to be fullest.

Segmentation by Threshold:

```
I = imread('pout.tif');  
figure, imshow(I);  
figure, imhist(I);  
BW = roicolor(I, 110, 255);  
figure, imshow(BW)
```

(Matlab Code for image segmentation)



Internet

William Stollings, fararuchen.

(Kurose, Ross)

⑦ Placed: Responsible 3rd.

① 'Language': English (Spoken - Written)

② C, Python, Java - Mandatory

Capsule ①

③ Technical Subject - (a) DSA (b) DBMS (c) SWE (d) CN-OS- COA (H/W)

(e) AIML - Data Science - ~~Cloud~~ - Cloud - IOT - Cybersecurity

④ Project - Capsule (e)

⑤ Appitude and Programming

- Quant
- Data Sufficiency / Int.
- Verbal English.
- LR

Code Snippets - Error/Output Prediction } Technical Round
↓
Then HR Round

Read - Economic Times, Financial Express.