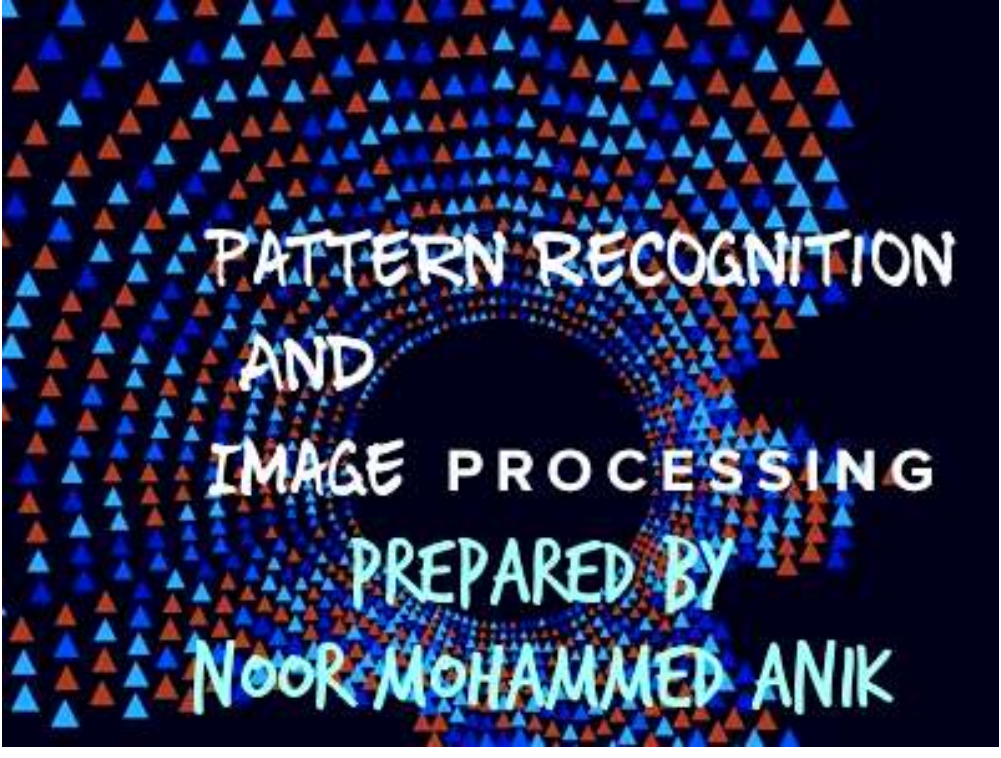

Midterm

PATTERN RECOGNITION AND IMAGE PROCESSING

Segment - 1

Prepared by —
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20-12-2016

1 What is Image processing?

Ans: The term "image processing" means modifying images. Image processing is a process which takes an image input and generates a modified image output.

2 what is computer vision?

Ans: Computer vision is the science that aims to give a similare, if not better, capability to a machine or computer. Computer vision concerned with the automatic extraction, analysis and understanding of useful information from a single image or a sequence of images.

3 Define Machine vision.

Ans: Machine vision is a method which provides an intensive introduction to the process of generating a symbolic description of an environment from a image.

[4] What is Image compression ?

Ans: Image compression is the process of encoding or converting an image file in such a way that it consumes less space than the orginal file.

[5] What is digital image processing ? Give some example of DIP (Digital Image Processing).

Am: Digital image processing is the use of computer algorithms to perform image processing on digital images.

Some example of digital image processing—

1. Improve image quality
2. Remove noise from image.
3. Fingerprint recognition
4. Number plate recognition
5. Enhancement of CCTV images.

[6] What are the components of general purpose image processing systems.

Ans: 1. Image displays
2. computers
3. Mass storage
4. Hard copy
5. Specialized image processing hardware.
6. Image processing software.
7. Image sensor.

[7] What is the main difference between gray level image and binary image?

Ans: ⊞ Gray image represented by black and white shades or combination of levels. For 8-bit gray image means total $2^8 = 256$ levels from black to white.

⊞ On the other hand, a binary image has only two values for each pixel, 0 and 1 corresponding to black and white.

[8] Write down the areas of application of image processing.

Ans: 1. Industrial machine vision applications

(i) Process control
(ii) Parts identification.
(iii) Automated visual inspection.
(iv) Robotic guidance and control.

2. Security, surveillance and law enforcement.

(i) Varification of identity.
(ii) Monitoring and surveillance.
(iii) Forensic investigations.

3. Diagnostic medical imaging

(i) Medical image processing.
(ii) Medical image reconstruction.

4. Remote sensing

(i) Mateorology.
(ii) Natural resource location.
(iii) Cartography.

5. Telecommunications

(i) Video text
(ii) Video conferencing
(iii) Video calls.

[2] Explain the fundamental steps of digital image processing.

Ans: The steps of digital image processing -

1. Image acquisition:

It is the first steps of otc process of the fundamental image processing.

2. Image enhancement:

Image enhancement is among the simpleot and most appealing areas of digital image processing.

3. Image restoration

Image restoration is an area that also deals with improving the appearance of an image.

4. Color image processing

The significant of color image processing increase in the use of digital images over the internet.

5. Wavelets and multiresolution Processing

It represents image in various degree of resolution.

6. Compression.

It is the process of reducing image size.

7. Morphological processing

It process images based on shapes.

8. Segmentation and representation

It is the process of partioning digital image and simplify the representation of image.

9. object recognition

It is the process of identifying a specific object in a digital image.

10 Explain about the ~~pseud~~ pseudocolor image processing.

Ans: Pseudo-color image processing is a technique that maps each of the grey levels of a black and white image into an assigned color. This color image, when displayed, can make the identification of certain features easier for the observer. The mapping are simple and fast. This makes pseudo color an attractive technique for use on digital image processing system.

[11] Show a model of image degradation/restoration.

Ans: Image restoration is to restore a degraded image back to the original image.

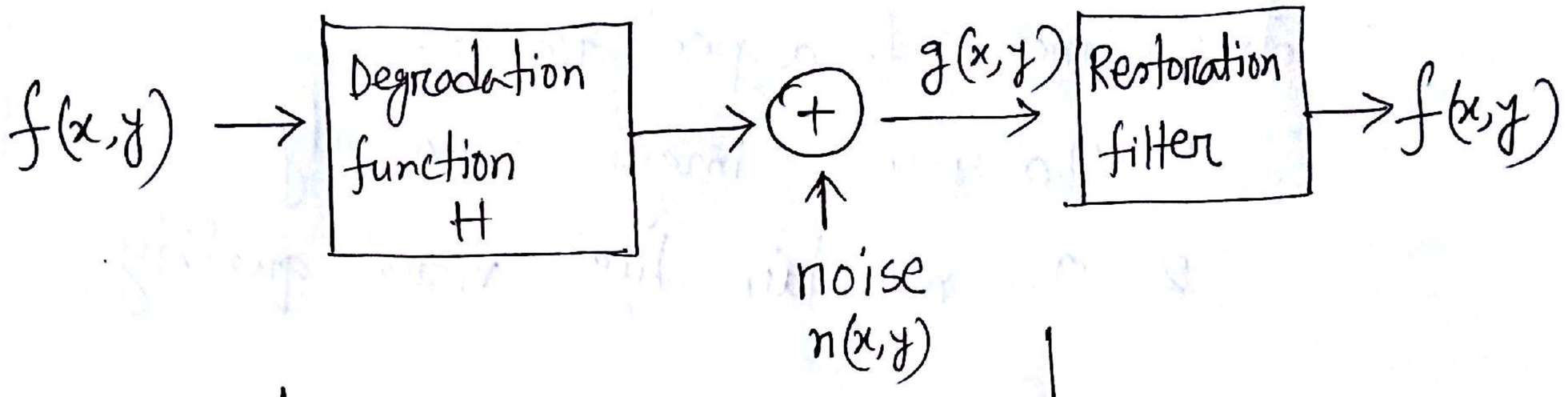

Fig: degradation/restoration model.

$$g(x,y) = f(x,y) * h(x,y) + n(x,y)$$

[12] Define color image and intensity (gray scale) image

Ans: **color image:**

A color image is a digital image that includes color information for each pixel.

Intensity:

The intensity of an image could refer to a global measure of that image, such as mean pixel intensity.

[13] Define aspect ratio. why it is important?

Ans: Aspect ratio of an image describes the proportional relationship between its width and its height.

Importance of aspect ratio -

1) To print image properly.
2) To maintain high visual quality.

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