Institute of Technology of Cambodia

Department of Information and Communication Engineering

Assignment: Image Processing

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Discussion 1

1) How does the computer display image from the real-world image?

2) What is the difference between analog and digital signal processing?

3) What is the difference between 4 and 8 neighborhood pixels?

4) In your opinion, among Euclidean, Block, and Chess distance algorithm which one is the best? Why?

5) What is the difference between binary, grayscale, and color image?

Answer

1)The computer display image from the real-world image by using sensor. There are many types of sensors such as visual sensors and other sensors. For visual sensors, there are photochemical which is used biological systems and photographic films and photoelectric which is used in CMOS and CCD. And about other sensors, there are medical imaging which is used for scanning body (X-ray) and detecting diseases(cancer). Seismic imaging which is used for finding crude oil and natural gas.

2)The different between analog and digital signal processing is analog signal processing is any type of signal processing conducted on continuous analog signals by some analog means which indicates something that is mathematically represented as a set of continuous value while digital signal processing is the numerical manipulation of signals, usually with the intention to measure, filter, produce or compress continuous analog signals.

3) The difference between 4 and 8 neighborhood pixels is 4 neighborhood pixels take 4 pixels near current pixel $C(x,y)$ while 8 neighborhood pixels take 8 pixels near current pixel $C(x,y)$.

4)In my opinion, the Euclidean is the best algorithm among other 2 distance algorithms Block and Chess because Euclidean distance can measure correct distance and it calculates the shortest way.

5)The difference between binary, grayscale, and color image are:

- Black and white images or binary images

➢ A pixel value is black or white (binary).
➢ It has only 2 values: 0 and 1 (or 255).

- Grey images or grey levels images

  ➢ A pixel value is represented by a scalar (only size, no direction) value.
  ➢ It has 256 values from 0 to 255.

- Color image

  ➢ A pixel value is represented by 3 scalar values (RGB).
  ➢ Each pixel has an intensity which consists of red value, green value, and blue value (eg.: intensity=50 → R=20, G=18, B=12).
  ➢ It has 256 values from 0 to 255