INSTITUTE OF TECHNOLOGY OF CAMBODIA

DEPARTMENT OF INFORMATION AND COMMUNICATION ENGINEERING

I5-GIC(B)

Image Processing

Assignment_Discussion02

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Discussion2

1) Why do we need to know data structure of images?

+ We need to know data structure of images because we want a structure that enables:

- To access to pixel values regarding the coordinates (x, y)
- To browse an image from the first to the last pixel
- To access to pixel (x, y) neighbors 2) How to access all pixels in a 2D image?

+ To access all pixels in 2D image we need

- 1D array: use only one loop, but difficult to access to neighbors.
- 2D array: use two loops and easy to access a neighbor.

3) Why do we need to convert from RGB to other color channels?

+ We need to convert from RGB to other color channels because to store a single-color pixel of an RGB color image we will need 8*3 = 24 bits (8 bit for each color component), but when we convert an RGB image to grayscale image, only 8 bit is required to store a single pixel of the image.

4) If we change the value of luminance, does the color change? Why?

+ The color change is dependent on hue. But changing the saturation and lightness/value changes the intensity and brightness of the color. Because What is the purpose of luminance? It provides the amount of light that passes through, is reflected, and falls within a given solid angle.

5) What is the difference between 2D, and 3D image?

+ The difference between 2D, and 3D image:

- 2D:
  - ✦ A 2D shape has two dimensions- length and breadth.
  - ✦ X-axes, Y-axes.
  - ✦ 2D shapes are used to give simple view of an object.
  - ✦ In 2D shapes, al the edges are clearly visible.
  - ✦ 2D shapes are easy to explain due to the visibility of all its edges.
  - ✦ It is easy to draw details in 2D shapes.

- ✦ It is easy to draw 2D Shapes.
- ✦ Circle, Square, Rectangle or any other polygon, etc.
- 3D:
  - ✦ A 3D shape has three dimensions- length, breadth and height.
  - ✦ X-axes, Y-axes and Z-axes.
  - ✦ 3D shapes are used to give architectural view of an object.
  - ✦ In 3D shapes, some of the edges are hidden.
  - ✦ In 3D shapes, only outer dimensions can be explained.
  - ✦ Detailing becomes difficult in 3d shapes.
  - ✦ Cylinder, Prism, tube, Cuboid, etc.
  - ✦ 3D shapes are complex in drawing.