

Image Processing & Computer Vision

Assignment 01

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1.4.

The output images produced through an image processing are either displayed to a human viewer or become a new input of other image analysis algorithm.

1.8.

Computer graphic is about how to produce images from a 3D model, however, computer vision is about how to get a model from images.

1.16

$$(38, 52) \rightarrow i = 52 \cdot 640 + 38 = 33318$$

$$(592, 241) \rightarrow i = 241 \cdot 640 + 592 = 154832$$

$$(33, 0) \rightarrow i = 0 \cdot 640 + 33 = 33$$

$$i = 8092 \rightarrow \text{mod}(8092, 640) = 412 \rightarrow (412, 12)$$

$$i = 24061 \rightarrow \text{mod}(24061, 640) = 381 \rightarrow (381, 37)$$

$$i = 38190 \rightarrow \text{mod}(38190, 640) = 430 \rightarrow (430, 59)$$

1.17

Need to interchange x and y and replace width with height:

$$i = x \cdot \text{height} + y$$

$$y = \text{mod}(i, \text{height}) = i - x \cdot \text{height}$$

$$x = \text{floor}(i / \text{height})$$

1.18

a) The image is described in interleaved format as follows:

$$\begin{bmatrix} (52, 68, 31) & (133, 192, 88) \\ (255, 208, 32) & (233, 161, 25) \end{bmatrix}$$

So, the RGB values at point (1,1) is (233, 161, 25). Which is red25, green161, blue233.

b) The image is described in planar format as follows :

$$\text{red : } \begin{bmatrix} 32 & 233 \\ 161 & 25 \end{bmatrix} \quad \text{green : } \begin{bmatrix} 192 & 88 \\ 255 & 208 \end{bmatrix} \quad \text{blue : } \begin{bmatrix} 52 & 68 \\ 31 & 133 \end{bmatrix}$$

So the RGB values at (0,1) are (31, 255, 161), which is red161, green255, blue31.

The Matlab file and test image are uploaded via canvas.

Please call the function by `[flipim(imread('name of image'))]`