ASSIGNMENT 1(LMS)

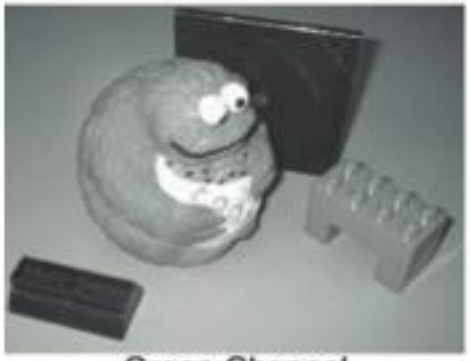
15 marks (weightage 0 to 7)

Question 1

- Choose an RGB image (Image1); Plot R, G, and B separately (Write clear comments and observations)


Original


Red Channel


Green Channel


Blue Channel

Question 2

- Convert Image 1 into HSL and HSV. Write the expressions for computing H, S and V/I.
- (Write clear comments and observations)

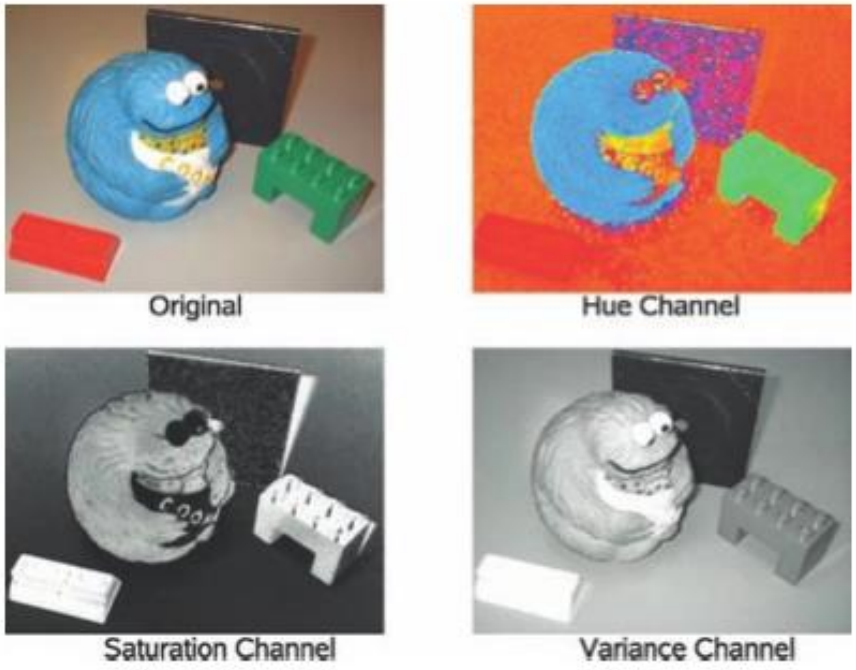


Figure 1.10 Image transformed and displayed in HSV colour space

Question 3

- Convert Image 1 into L*a*b* and plot

Question 4

- Convert Image 1 into Grayscale using the default OpenCV function. Write the expressions used for the conversion.

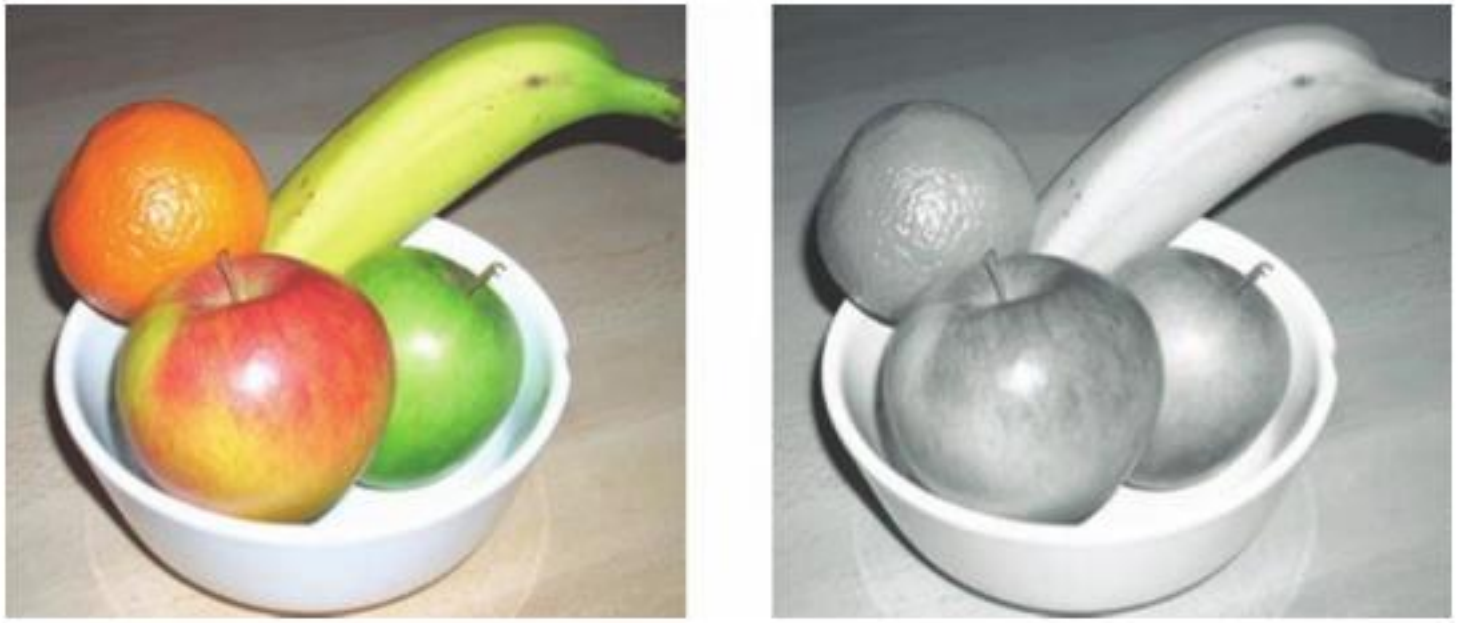


Figure 1.8 An example of RGB colour image (left) to grey-scale image (right) conversion

Question 5

- Take a grayscale image (Image 3) and illustrate
  - Whitening
  - Histogram equalization

Question 6

- Take a low illumination noisy image (Image 4), and perform Gaussian smoothing at different scales. What do you observe w.r.t scale variation?

Question 7

- Take an image (Image 5) and add salt-and-pepper noise. Then perform median filtering to remove this noise.

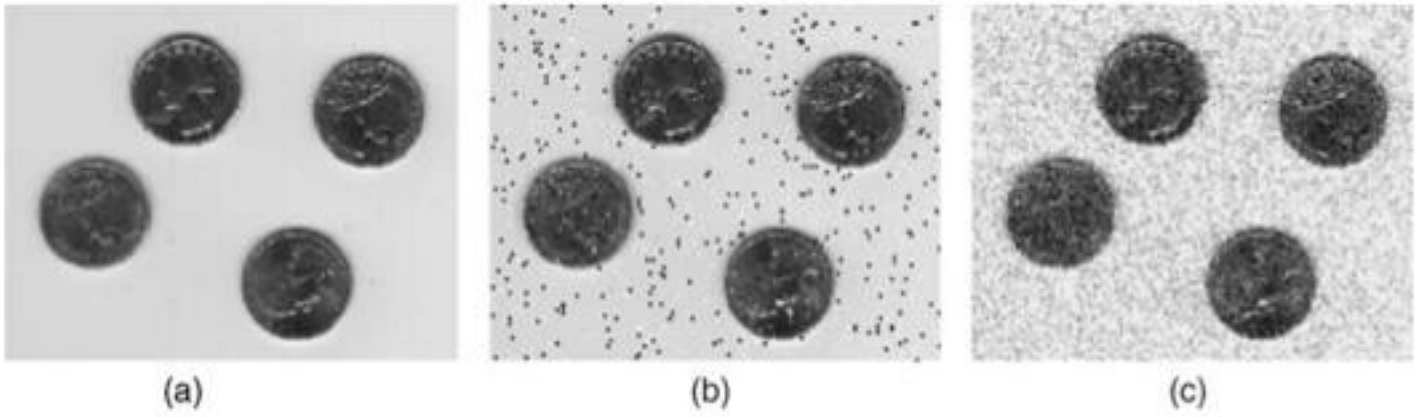


Figure 4.3 (a) Original image with (b) 'salt and pepper' noise and (c) Gaussian noise added

Question 8

- Create binary synthetic images to illustrate the effect of Prewitt (both vertical and horizontal) plus sobel operators (both vertical and horizontal)
  - Clue: check when you have a vertical/horizontal strip of white pixels – vary width of the strip from 1 pixel to 5 pixels
  - What do you observe?

Question 9

- What filter will you use to detect a strip of 45 degrees

starters

Question 10

- Take an image and observe the effect of Laplacian filtering
- Can you show edge sharpening using Laplacian edges

Figure 4.14 Edge sharpening using the Laplacian operator

Question 11

Detect Road land markers

Question 12

Classify modes:
Night; Portrait;
Landscape
Design features, use NN

Instructions

- Write clear comments and observations
- Submit a zip file with PDF, OpenCV code as well
  - Who submits? Team lead
- Terminologies (Group = Team1, Team2); Group Lead, Team Lead (Team - Reporter; Coder)
- Jan 26: Deadline for Team1 to submit to Team2 and LMS
- Jan 29: Review Comments (report, code) to the partner pair and LMS (Write it better - what is not clear; Code it better)
- Feb 1: Final submission on LMS

Next Few classes

- Jan 19 class: 3:45 to 5:15 pm
- Extra class: Jan 25 (Wed: 1:30 – 3:30)

- Assignment 2 – Feb 2 class; ML starts Feb 2 class
- Feb 2, 9, 16 classes => Mid Sem

- OpenCV related queries
  - Neha.Tarigopula@iiitb.org; Praneeth.kumar@iiitb.org; (Python)
  - Chinchu.Thomas@iiitb.org; annapurna.sharma@iiitb.org; (C++)