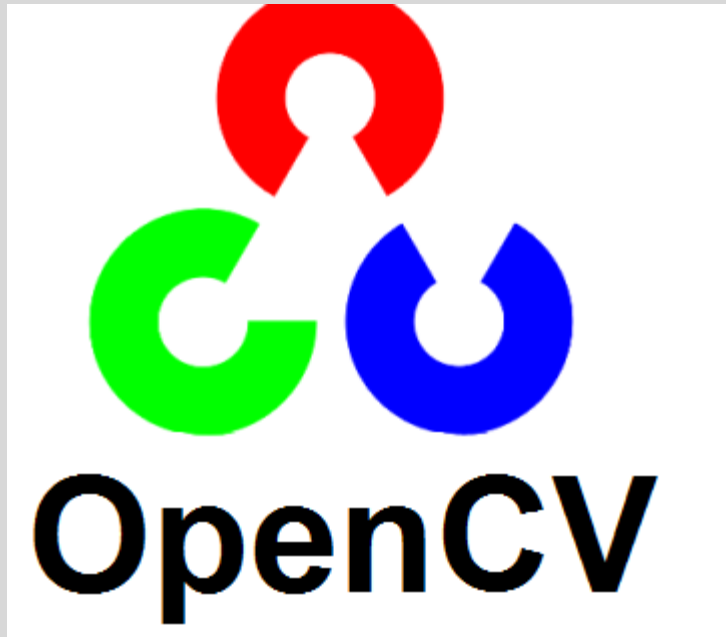# PS1: IMAGE AS FUNCTION

Ali Alrasheed

1- Input Images
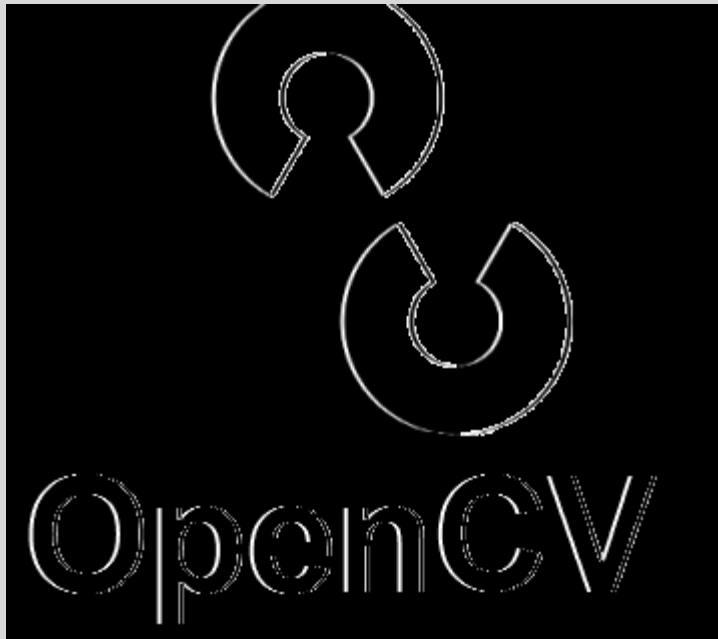

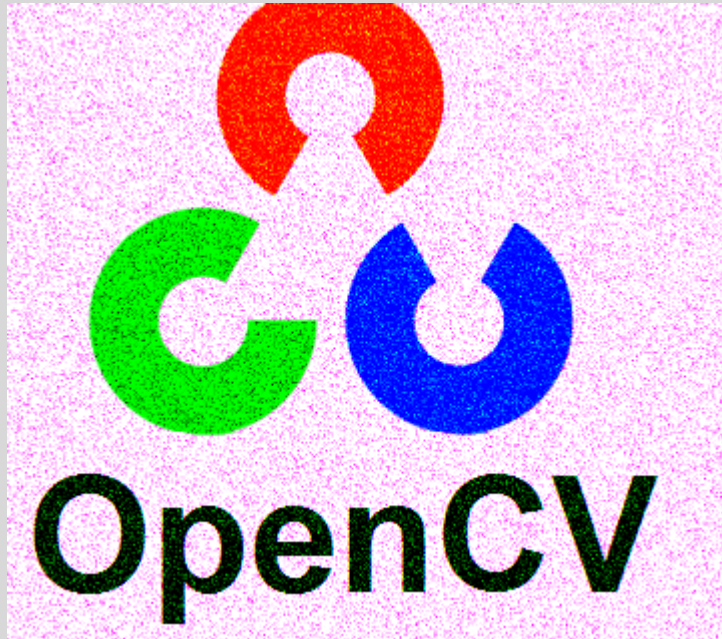ps1-1-a-1.png

ps1-1-a-2.png
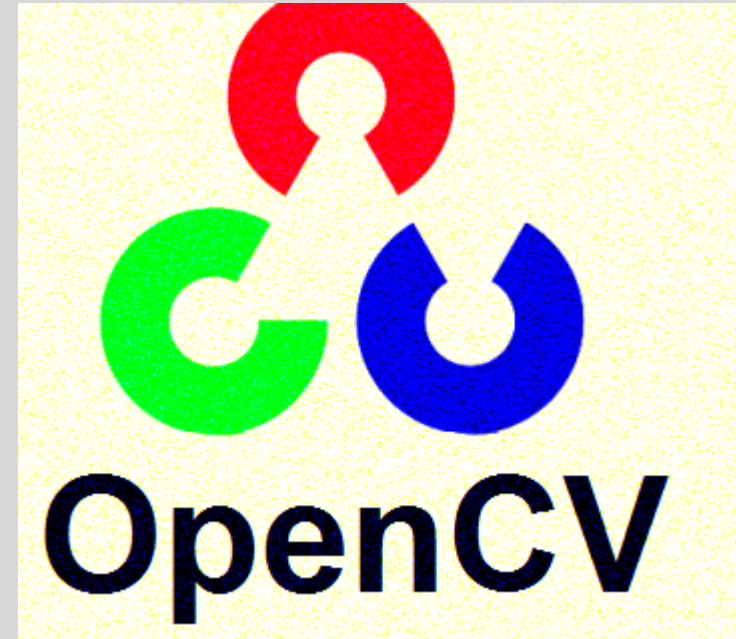
4- Difference Image

ps1-4-d-1.png

5- Add noise

ps1-5-a-1.png
(green channel)

ps1-5-b-1.png
(Blue channel)

6- Discussion

- A:
  - i. Green Channel
  - ii. This is because the grayscale image is converted by giving more weight for the green channel than the rest of the channels.

    RGB[A] to Gray:$Y \leftarrow 0.299 \cdot R + 0.587 \cdot G + 0.114 \cdot B$ (opencv website)

    They are weighted according to their wavelength. Also, the human eye is more sensitive to green than red and blue.
  - iii: No, It doesn't matter, the weighting for the green channel is more than the rest of the channels in all grayscale images.

- B:
  - i: Some images' range is between -1 and 1, some are uint8 [0,255], and some are even normalized [0,1]. There are just a pixel convention. However, in some case, they are a result of manipulating the image. For example, in the case of taking the difference between 2 images. In this case, the negative pixels means that the result image was subtracted from a brighter image.
  - ii: If it is not maintained, some information in the image is lost forever. Therefore, the original image cannot be recovery. Also, some images have a natural range of [-1,1].

- C
  - i: green channel
  - ii: humans are more sensitive to green, also green has more weighting in the image.
  - iii: 10 for green, and 50 for blue

7- Hybrid Image
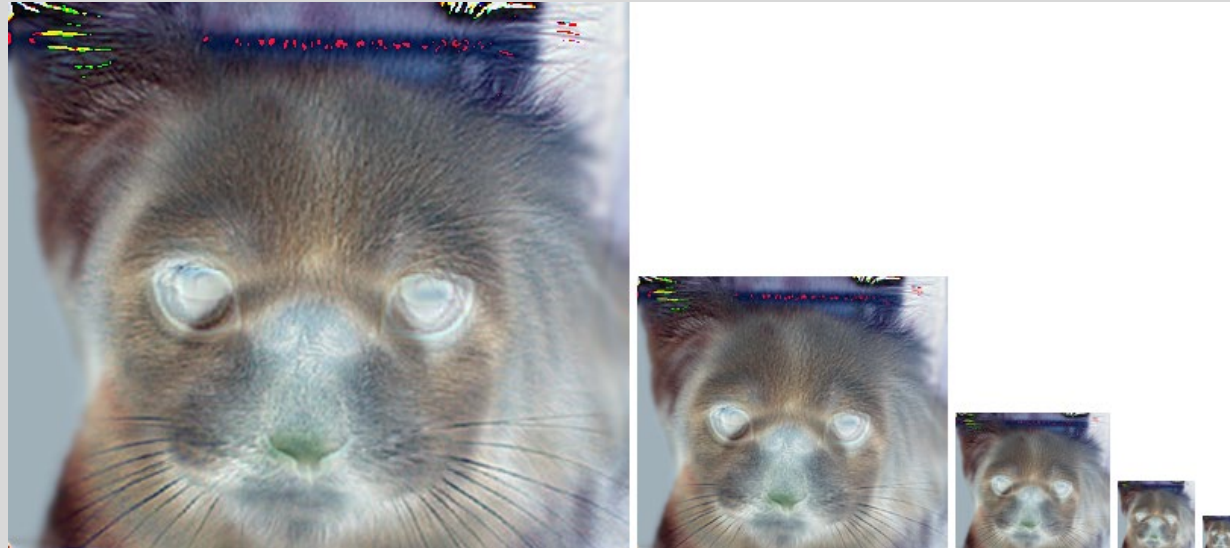
ps1-7-a-1.png (Hybrid Image)

A: Tune value is 3

B: Increasing the cutoff-frequency will make the cat dominate the image, whereas decreasing it will make the dog more visible.