

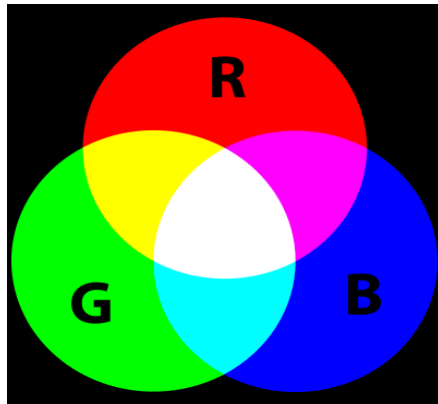
Image Processing-Edge detection



Model to Represent Color

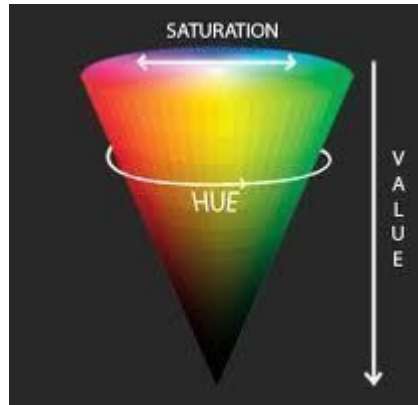
1) RGB

The **RGB color model** is an [additive color model](#) in which [red](#), [green](#), and [blue](#) light are added together in various ways to reproduce a broad array of [colors](#)



2) HSV

Hue, Saturation, Value or HSV is a color model that describes colours (hue or tint) in terms of their shade (saturation or amount of gray) and their brightness (value or luminance).



Format

PPM:

PPM format is an uncompressed file format which are generally smaller and easy to handle. It gives following thing when Image of a file is load:

```
P3
3 2
255
# The P3 means colors are in ASCII, then 3 columns and 2 rows,
# then 55 for max color, then RGB triplets
255 0 0 0 255 0 0 0 255
255 255 0 255 255 255 0 0 0
```

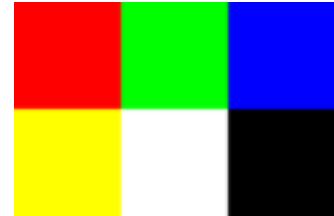


Image detection

Book represents three types of image detection techniques:

- 1) Edge detection
- 2) Texture detection
- 3) Optical flow detection

Edge Detection

- Edges are the straight lines or curves in the image plane across which there is a significant change in brightness.
- The output displays more compact and abstract representation.
- Edges corresponds to loactions in images where the brightness undergoes a sharp change.

$$\nabla I = ((\partial I / \partial x), (\partial I / \partial y)).$$

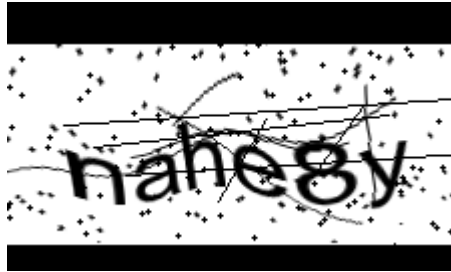
where ∇I shows the gradient. The value of this gradient should be large at the edges.

Also, the direction of direction of the gradient.

for checking for edges, we need to check for some pixels around that are in same direction. I,e their orientations should be same.

Work Done for Project

- 1) Cleared Background noise
- 2) Created Intensity matrix which contain the average of R,G and B values
- 3) Calculated gradient
- 4) Calculated the Direction(theta)
- 5) Set a threshold value for the gradient and the number of neighbours having same orientation.



INPUT



OUTPUT

Texture

Image Detection can be done using texture detection also. The research paper I read used features like brightness, texture and color to detect the image and then they trained a sample data . The data consisted of natural images with human marked boundaries on the images.

Optical Flow

Optical flow can also be used as a measure of edge detection. It basically take into consideration two frames at two different time and the check the difference between them.

Segmentation

Segmentation is the process of breaking an image into regions of similar pixels. Some attributes vary little in same regions. But when you move from one region to another region, the value vary with great extend.