Color Conversion

AIM

To perform the color conversion between RGB, BGR, HSV, and YCbCr color models.

Software Required:

Anaconda - Python 3.7

Algorithm:

Step1:

Import cv2 library and upload the image or capture an image.

Step2:

Read the saved image using cv2.imread("filename.jpg").

Step3:

Convert the image into the given color transformation using cv2.cvtColor(image, cv2.BGR2YCrCb) and similarly for other color formats.

Step4:

Split and merge the image using cv2.split(hsv) and cv2.merge([h,s,v])

Step5:

Output the image using cv2.imshow("OUTPUT", image)

Program:

Developed By: **Shafeeq Ahamed. S**
Register Number: **212221230092**

i) Convert BGR and RGB to HSV and GRAY

```
img = cv2.imread('Mikasa.jpeg')
cv2.imshow('original',img)

bgr2hsv = cv2.cvtColor(img,cv2.COLOR_BGR2HSV)
cv2.imshow('BGR To HSV',bgr2hsv)

bgr2gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
cv2.imshow('BGR To GRAY',bgr2gray)

rgb2hsv = cv2.cvtColor(img_rgb,cv2.COLOR_RGB2HSV)
cv2.imshow('RGB2HSV',rgb2hsv)

rgb2gray = cv2.cvtColor(img_rgb,cv2.COLOR_RGB2GRAY)
cv2.imshow('RGB2GRAY',rgb2gray)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

ii) Convert HSV to RGB and BGR

```
cv2.imshow('HSV',bgr2hsv)

hsv2rgb = cv2.cvtColor(bgr2hsv,cv2.COLOR_HSV2RGB)
cv2.imshow('HSVtoRGB',hsv2rgb)

hsv2bgr = cv2.cvtColor(bgr2hsv,cv2.COLOR_HSV2BGR)
cv2.imshow('HSVtoBGR',hsv2bgr)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

iii) Convert RGB and BGR to YCrCb

```
cv2.imshow('RGB',img_rgb)

rgb2YcrCb = cv2.cvtColor(img_rgb,cv2.COLOR_RGB2YCrCb)
cv2.imshow('RGBtoYCrCb',rgb2YcrCb)

bgr2YcrCb = cv2.cvtColor(img,cv2.COLOR_HSV2BGR)
```

```
cv2.imshow('BGRtoYCrCb',bgr2YcrCb)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

iv)Split and Merge RGB Image

```
b,g,r = cv2.split(img)
cv2.imshow("RED MODEL", r)
cv2.imshow("GREEN MODEL", g)
cv2.imshow("BLUE MODEL ", b)

merger = cv2.merge([b,g,r])
cv2.imshow("MERGED IMAGE", merger)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

v) Split and merge HSV Image

```
cv2.imshow("INITIAL_HSV ", bgr2hsv)

h,s,v = cv2.split(bgr2hsv)
cv2.imshow("RED MODEL", h)
cv2.imshow("GREEN MODEL", s)
cv2.imshow("BLUE MODEL ", v)

merger = cv2.merge([h,s,v])
cv2.imshow("MERGED IMAGE", merger)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

Output:

i) BGR and RGB to HSV and GRAY

Original - BGR

BGR to HSV

BGR to GRAY

Original - RGB

RGB to HSV

RGB to GRAY

ii) HSV to RGB and BGR

Original - HSV

HSV to RGB

HSV to BGR

iii) RGB and BGR to YCrCb

Original - RGB

RGB to YCrCb

Original - BGR

BGR to YCrCb

iv) Split and merge RGB Image

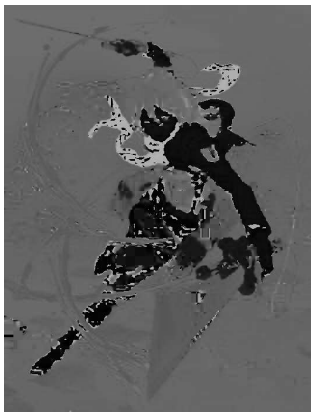
RED Component

GREEN Component

BLUE Component

MERGED Image

v) Split and merge HSV Image

HUE Component	SATURATION Component	VALUE Component	MERGED Image
			

Result:

Thus the color conversion was performed between RGB, HSV and YCbCr color models.