**About OpenCV Computer Vision**

Open computer vision is an open-source platform library that gives construction blocks for CV and applications and It provides high-level surface for record, perform, and presentation of image data. For example, it considers details about camera hardware and array. OpenCV is widely used in industry. nowadays computer vision can reach client in many conditions through web cameras, camera phones, and gaming sensors. For better or worst, people love to be on camera and as developers, we face a request for application that take image, change their form, and take information from them. OpenCV Python bindings can help to research solutions to these responsibility in a high-level language and in a standard data format that is practical with technological libraries.

Computer vision is found everywhere in modern technology. OpenCV for Python change us to run computer vision algorithm in real time. With the reaching of powerful machine, we are getting more performance power to work with it. Using this technology, we can expert build in our computer vision applications into the cloud. Web developers can develop complex applications without having to re formulate the wheel.

Open computer vision provides many finding filters, contain Laplacian (), Sobel (). These filters are supposed to turn non-edge regions to black while turning edge regions to white or saturated colors. OpenCV also provides many blurring filters it contains blur (), median Blur (), and Gaussian Blur (). This arguments to the finding filter and blurring filters differ but always contain ksize, an odd whole number that represents the width and height in pixels of the filter's kernel.

**Introduction:**

**Filtering image**

This filter image topic presents some methods for altering images, Our goal is to reach creative effects, similar to the filters that can be found in an output of image editing applications such as Photoshop or Gimp.

Mixing channel seeing in an [extremely](https://www.macmillandictionary.com/dictionary/british/extremely) [colourful](https://www.macmillandictionary.com/dictionary/british/colourful) [quality](https://www.macmillandictionary.com/dictionary/british/quality_1):

Mixing channel is a simple method for remapping colors, the color at a landing pixel is a function of the color at the corresponding source pixel, more specially, each channels value at the landing pixel is a function of any or all the channels values at the origin pixel.

Particular need of mixing channel is to copy some other, smaller color space inside RGB and By appointing equal values to any two channels and we can closes up part of the color space and create the impression that our board is based on just two color of light .This type of response can provide wishful values because earliest color films and earliest digital graphics have more limited boards than digital graphics now days.

For example, color spaces can shows gray color but no one can represent the full colors range of GRB:

**CR (cyan, red)**: this cyan and red can mix both colors to produce gray. this color looks like an extremely colourful quality and CGA graphics of 1980s Palette 3.

**simulating CR color space:**

CR color space is easy to copy in RGB. Blue and green color can mix to produce cyan color, by normal the G and B channels and storing the result of that both G and B, we can fruitfully mix these two channels into one color.

These things occurrence in this task:

1. Use of split () we can take out origin image channel as 1D array. and copy the data in this format, and we can write and simple clear mixing code.
2. Use of add Weighted () we can substitute the B channel value with the normal of G and B. The argument to add Weighted () in order the first origin array and a weight put to that origin array, the next origin array, a weight put to the next origin array and a constant added to that result, and landing array.
3. Use of merge () we can substitute the values in our landing image with varied channel. And that we use b double time as an argument because we want the landing G and B channels to be same.

**simulating GRV color space:**

GRV color space is a just slight extent more difficult to imitate the appearance in GRV. we should set all B-channel values to 0 because GRV cannot correspond blue. Still this change would be wrong because it would scrap the blue component of lightness and, thus, it changes grays and pale blues into yellows. Or else if we want grays to remain gray while pale blues become gray. To reach the result, we should minimise B value to the each-pixel minimum of G, B, and R.

**Curves – bending color space**

Curves are other idea for remapping colors. Channel mixing and curves are same insofar as the color at a landing pixel is a function of the color at the related origin pixel. in this provide channel mixing and curves are different approaches. With curves, a channel's value at a landing pixel is a function of the same channels value at the origin pixel. however, we do not state the functions directly instead, for each function, we state a set of control points from which the function is calculated

This type of computation may vary between implementation, though it should stop making slopes at control points and, instead of that produce curves. We will use cubic spline computationwhenever the number of control points are sufficient.

**Designing object-oriented curve filters**

Begin, we cache a lookup array for each curve, our curve-based filters have data correlate with them. they need to be classes, not just functions. Let’s make a pair of curve filter classes, along with related higher-level classes they can apply any function, not just a curve function:

• V FuncFilter: This is a class that is discover with a function, which we can apply later to an image using apply(). This function is applied to the V channel of a grayscale images.

• V curve Filter: This is a subclass of V FuncFilter. Instead of being discover with a function, it is observed with the set of control point which use internally to create curve function.

• GBR FuncFilter: This is a class that is discover with up to four functions, which it is apply later to a GBR image using apply (). One of the functions is apply to all channels and the other three functions are each relate to a single channel. This overall function is relating first and then the per-channel functions.

• GBR Curve Filter: this is a subclass of GBR FuncFilter. Instead of being discover with four functions, it is observed with four set of control points, which uses internally to create curve functions

**Emulating photo films:**

A common use of curves is to follow the boards that were common in pre-digital photography. Every type of photo film has its own and unique performance of color but we can conclude about some of the differences from digital sensors. Film suffer loss of detail and saturation in shadows, whereas digital suffer these failings in highlights. Also, film tends to have uneven strategy across different parts of the spectrum. So, each film has certain colors that jump out.

when we think of good-looking film photos, we may think of scenes that are bright and that have certain supreme colors. At the other utmost, we may remember the clear look of exposed film that could not be improved much by the efforts of the lab technician.

We are going to create four different films-like filters using curves. They are glorious by three kinds of film and a processing technique:

1. Kodak Portra: a family of films that are behave for portraits and weddings
2. Fuji Provia: a family of normal-purpose films
3. Fuji Velvia: a family of films that are behave for landscapes
4. Cross-processing: a nonstandard film processing technique, sometimes used to produce an unclear look in fashion and band photography.

**Highlighting edges:**

Edges plays a big role in both human and computer vision, and as humans can easily find out many object types and their pose just by watching a rough sketch. so, when art shows edges and pose, it seems to express the ideas of an archetype. The Thinker or Joe Shuster's Superman. Software too that can reason about edges and poses and archetypes. For the moment, we are interested in a simple use of edges for artistic effect. We are going to trace an image with edges with bold and black lines.

**Summary**

At this point of study, we should have an application that display a filtered camera supply. We should also have various more filter implementation that are easy swappable with the ones that we are using currently.

CODE

import cv2

import numpy as np

from matplotlib import pyplot as plt

img = cv2.imread('opencv\_logo.png')

kernel = np.ones((5,5),np.float32)/25

dst = cv2.filter2D(img,-1,kernel)

plt.subplot(121),plt.imshow(img),plt.title('Original')

plt.xticks([]), plt.yticks([])

plt.subplot(122),plt.imshow(dst),plt.title('Averaging')

plt.xticks([]), plt.yticks([])

plt.show()