**Cartoonify Image with Machine Learning**

**Project Idea:**

My aim is to transform images into its cartoon. Yes, the objective of this machine learning project is to CARTOONIFY the images. We will build a python application that will transform an image into its cartoon using OpenCV.

### **What is OpenCV?**

OpenCV library used for Computer Vision. It includes applications like **video and image capturing and processing.**

It is majorly used in

* Image transformation.
* Object detection.
* Face recognition.

**Step 1: Importing the required modules**

We will import the following modules:

* **CV2:** Imported to use OpenCV for image processing.
* **Numpy**: Images are stored and processed as numbers. These are taken as arrays. We use Numpy to deal with arrays.
* **Matplotlib**: This library is used for visualization and plotting. Thus, it is imported to form the plot of images.
* **OS:** For OS interaction. Here, to read the path and save images to that path.

#### Step 2: Building a File Box to choose a particular file

#### Label():

#### We created an object “lbl” and called the **label()** function and we passed the required arguments. Root & text arguments are must to pass. Here root means that we want to lace our label on root (which is our default GUI window).

### **Attributes we can use with Labels**

|  |  |
| --- | --- |
| **Attributes Name** | **Description** |
| fg | used to give the color to font |
| bg | used to change the background color |
| font | used for external font styling |
| image | We can also use image as label. |

In this step, we will build the main window of our application, where the buttons, labels, and images will reside. We also give it a title by title () function.

***NOTE:*** Now, all the operation will be done on the button click, thus all the below steps are the part of function Cartoonify (Image Path)

#### Step 3: How is an image stored?

Now, just think, how will a program read an image? For a computer, everything is just numbers. Thus, in the below code, **we will convert our image into a Numpy array.**

***NOTE:*** We resize the image after each transformation to display all the images on a similar scale at last.

**Beginning with image transformations:**

To convert an image to a cartoon, multiple transformations are done.

1. An image is read as a Numpy array then converted to a Grayscale image.
2. the Grayscale image is smoothened,
3. Try to extract the edges in the image.
4. We form a color image and mask it with edges. This creates a beautiful cartoon image with edges and lightened color of the original image.

#### Step 4: Transforming an image to grayscale

#### Step 5: Smoothening a grayscale image

To smoothen an image, we simply apply a blur effect.

#### Step 6: Retrieving the edges of an image

#retrieving the edges for cartoon effect

#by using thresholding technique