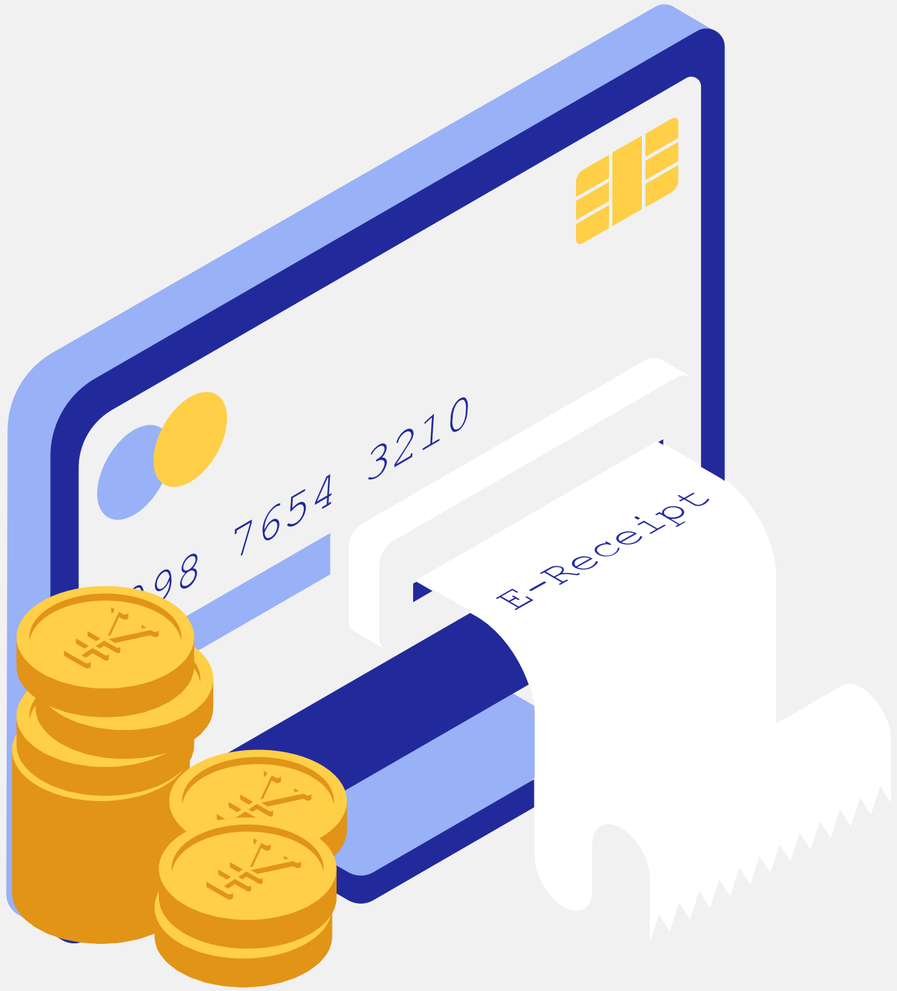

Image processing using openCV

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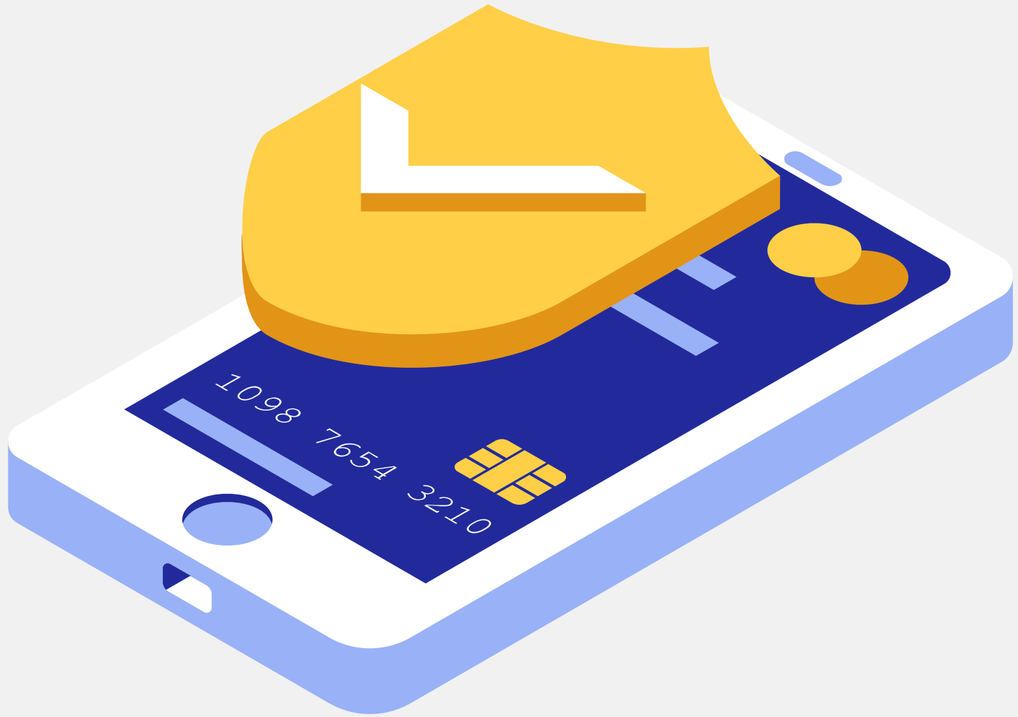
Introduction

Image processing is a technique used to manipulate an image through several sets of algorithms resulting in an output image or any feature abstracted from the image.

The manipulations in an image include conversion to grayscale, separating the layers of RGB pixels, blurring an image, edge detection and cat face detection.



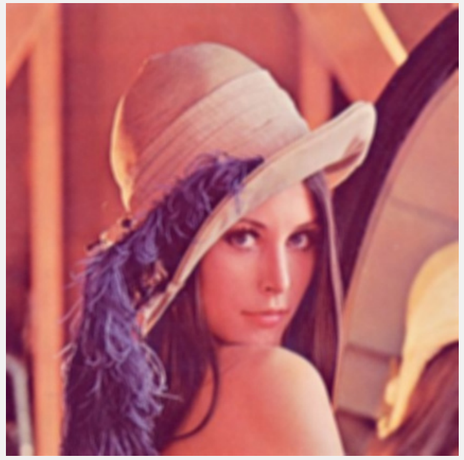
Our project mainly comprises of few basic filters applied on images using OpenCV and NumPy arrays.

It is a fun project which allows us to visualize how images are processed in a computer and the functioning of various inbuilt features in the above-mentioned libraries.

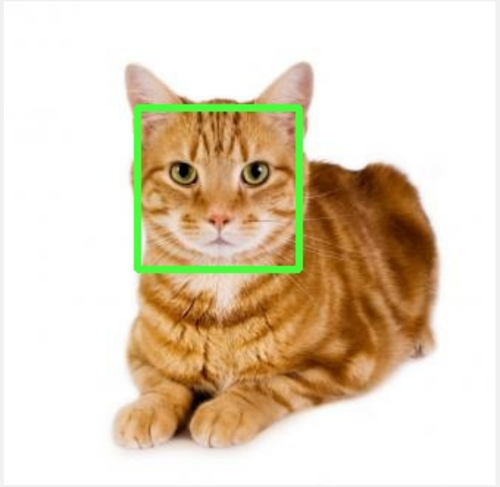
Features

- Grayscale
- Color channel separation
- Edge detection
- Circle detection
- Cat face detection
- Gaussian blur

FUNCTIONS



Negative	Blur effect	Grayscale
For negative transformation of an image then we need to invert the 3 channels (rgb). We do this by subtracting 255 from each of the original image's pixels.	The blur() function traverses through the numpy array of the image and takes the average value of the surrounding pixels and updates the value to create a blur image. This is also called average blur method.	A normal rgb image is a 3-d numpy array to convert it into a grayscale image, we need to remove two layers from the rgb panels. This can be done using in-built functions or manually.



Edge detection	Cat face detection	Circle detection
The canny filter is used to detect the edges in an image, we can adjust the frequence of these edges by giving required parameters.	An xml file is used as reference to predictthe location of cat’s face is present in the image. It is highlighted with a square according the dimension of the face.	Detection of elements in an image is done on gray-scale images. Using HoughCircle function and HoughGradient method, any circle present in the image gets detected and is highlighted .

Resources

- Github
- W3schools
- YouTube
- Research Papers