IET SMP 2021-Computer Vision

Welcome Guys!!!

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Course Plan

The following are the topics that we will cover in this SMP over the next 8 sessions.

Prerequisites:

1)Basic Understanding of Python

2)Eagerness to learn new stuff :)

Session no.	Topics to be covered
1	Introduction to CV, Colab, Numpy, Matplotlib, OpenCV Basic operations on images using OpenCV
2	Click Events, Bitwise Operations, Colour detection, Thresholding
3	Morphological transformations, Image Smoothing, Image Gradience, Edge detection
4	Contours, Motion detection and tracking
5	Face Detection using Haar Cascades (OpenCV)
6	Introduction to Neural Networks in CV
7	More about Neural Networks
8	Face detection using CaffeModel (OpenCV), MTCNN
9	Object detection using YOLO (Project)

Tasks and Perks of taking this SMP

Tasks will be given at times during this course. Don’t worry they will be fun and exciting to do.These tasks will be used to grade you guys towards the end.

You might ask what is the use of the grades?

Next year during Club recruitments, these grades will enable you to skip the first round of the recruitment where many people get filtered out.So you have that advantage over the others :).

Introduction

Computer vision is a field of artificial intelligence that trains computers to interpret and understand the visual world. Using digital images from cameras and videos and deep learning models, machines can accurately identify and classify objects — and then react to what they “see.”

Introduction contd

There are many types of computer vision that are used in different ways:

- Image segmentation
- Object detection
- Facial recognition
- Edge detection
- Pattern detection
- Image classification
- Feature matching

Google Colab

Colaboratory, or “Colab” for short, is a product from Google Research. Colab allows anybody to write and execute arbitrary python code through the browser, and is especially well suited to machine learning, data analysis and education.

Jupyter is the open source project on which Colab is based. Colab allows you to use and share Jupyter notebooks with others without having to download, install, or run anything.

https://colab.research.google.com/

MatPlotLib,Numpy and OpenCV Libraries

Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in *Python*.

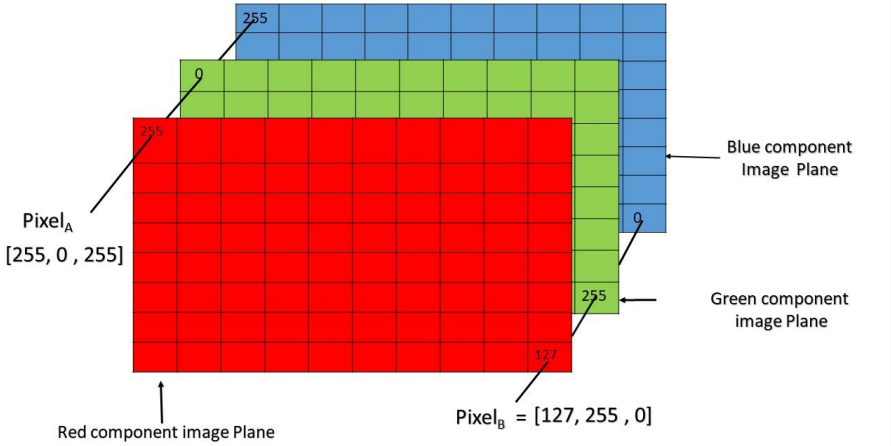
NumPy is a Python library used for working with arrays.It also has functions for working in domain of linear algebra, fourier transform, and matrices.

OpenCV is a cross-platform library using which we can develop real-time computer vision applications.

Let’s head over to Google Colab

How is a Image is Stored

It is stored as a m x n x 3 array .The color of each pixel is determined by the combination of the red, green, and blue intensities stored in each color plane at the pixel's location.Levels of R, G, and B can each range from 0 to 100 percent of full intensity. Each level is represented by the range of decimal numbers from 0 to 255.



Pixel of an RGB image are formed from the corresponding pixel of the three component images

Let’s head over to Google Colab

Thank You Guys!!