

Report

WiDS project 2024 : Computer Vision

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I started with the revision of numpy and matplotlib then learned the basics of computer vision using OpenCV : which were Reading Images & Video, Resizing and Rescaling Frames, Drawing Shapes & Putting Text, 5 Essential Functions in OpenCV, Image Transformations, Contour Detection, Color, Spaces Color Channels, Blurring, BITWISE Operations, Masking, Histogram Computation, Thresholding / Binarizing Images, Edge Detection starting with the advanced techniques : Face Detection with Haar Cascades, Face Recognition with OpenCV's built-in recognizer, Deep Computer Vision: Classifying Characters from "The Simpsons"

I coded all these functions on my PC and learnt them.

Then started with the projects of OpenCV with the help of pre requisites learnt in first 3 weeks : the projects included making a hand tracking module, pose estimation module , Face Detection Module, Face Mesh Module, Gesture Volume Control, Finger Counter, AI Personal Trainer, AI Virtual Painter, AI Virtual Mouse

In all the projects : we use cv2 library and mediapipe library using the dataset mediapipe is trained on , it can detect 21 key points on the palm and 33 landmarks on the whole body. we can get the coordinates of each point and track any of them to do the required tasks. for example , the gesture volume control project used the distance between index finger and thumb to get the volume change required.

The codes for all the projects and basics of OpenCV that I learnt are submitted by me.