



Bleed AI

Bringing Computer Vision to the masses

Computer Vision & Image Processing with Python



This Computer Vision Course is designed for beginners & professionals to start a career in Computer Vision, In just 3 months you will be building real world Vision Applications. you learn from the ground up what the image is and how to manipulate it at the lowest level and then you gradually built up from there and learn to work with powerful algorithms.

Prerequisite: Some programming experience in any language.

Knowledge of Python is a Plus, although not required as we will go through a Crash course In python

Duration: 3 Months (12 Weeks)

Contents: Inside this course you'll find about **125** Video Lectures, Over **100** Tutorial style Jupyter notebooks, **11** Quizzes, Discussion forums, Optional Assignments & **more.**

SYLLABUS

WEEK 0: COURSE INTRODUCTION

- 0.01 Welcome to the course
- 0.02 Course Structure
- 0.03 (a) What is Computer Vision
- 0.03 (b) An Overview of Computer Vision Sub Fields
- 0.04 Computer Vision Vs Image Processing
- 0.05 About Opencv & learning resources
- 0.06 Resources to learn Python



WEEK 0: COURSE INTRODUCTION (CONTD)

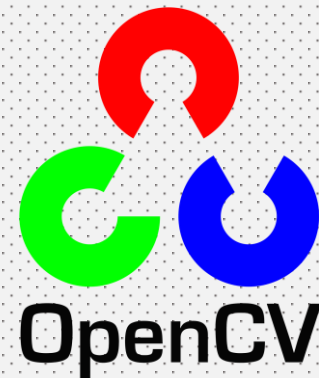
- 0.07 Anaconda & Why we need Virtual Environments
- 0.08 Installing Anaconda and checking it
- 0.09 Creating Python Scripts and Running it
- 0.10 How to use a Jupyter notebook
- 0.11 Installing OpenCV and testing installation.
- 0.12 Troubleshooting Installation problems
- 0.13 Setting up the working directory
- 0.14 How to Solve Programming Errors



WEEK 0: COURSE INTRODUCTION (CONTD)

0.16 Using Google Colab

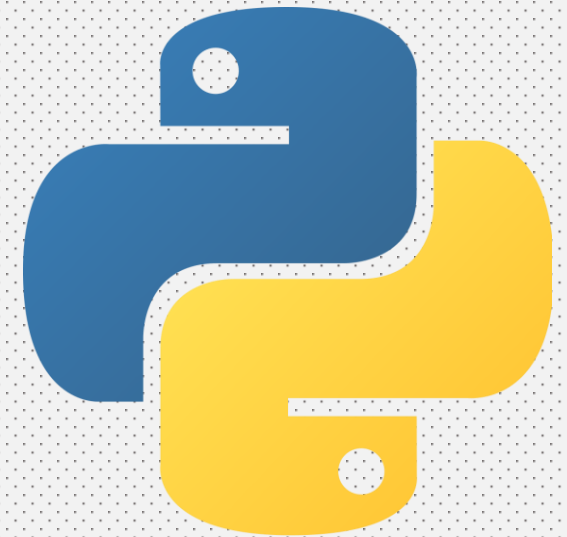
0.17 Creating a Virtual Environment &
Installing a notebook



WEEK 1: PYTHON CRASH COURSE

- 1.00 Week 1 Introduction
- 1.01 Datatypes, Variables, Strings, Printing
- 1.02 Input, Eval, Lists, Dict
- 1.03 Booleans, tuples, sets, operators, Conditional statements
- 1.04 Loops, Enumerate, List Comprehension
- 1.05 Functions, Lambda, Map, Filter, Methods
- 1.06 Interospection, Try-Except, Help, Import, OOP

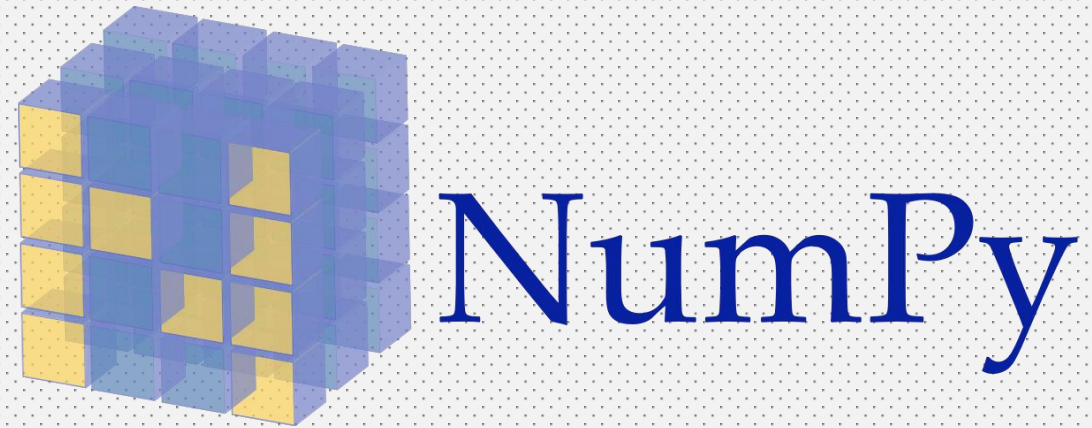
Python Quiz



WEEK 1: NUMPY CRASH COURSE

- 1.07 Numpy Crash Course Pt 1
- 1.08 Numpy Crash Course Pt 2
- 1.09 Numpy Crash Course Pt 3

Numpy Quiz



WEEK 2: OPENCV BASICS

- 2.00 Week 2 Introduction
- 2.01 Opencv Fundamentals
- 2.02 Imshow, Resizing, Imwrite & Conditional Exit
- 2.03 Drawing Shapes & Text On Image
- 2.04 Working with Videos
- 2.05 Using Mouse & Trackbar
- 2.06 Manipulating Image ROI & Channels
- 2.07 Image Addition, Resizing & Blending
- 2.08 Making an Image Transition Application



WEEK 2: OPENCV BASICS (CONTD)

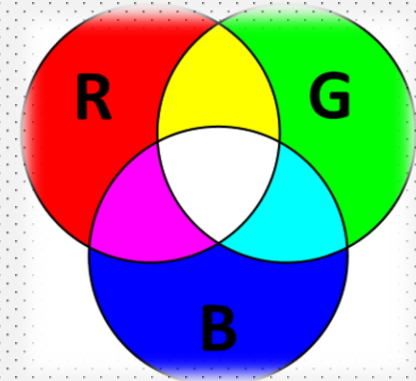
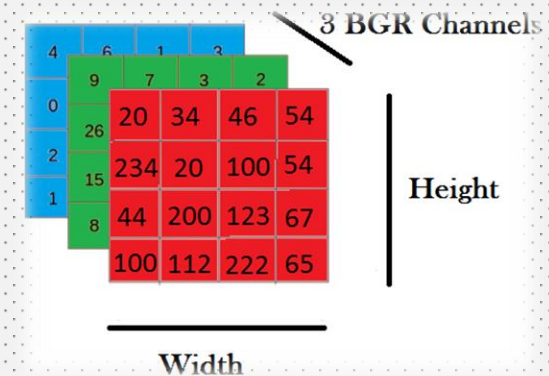
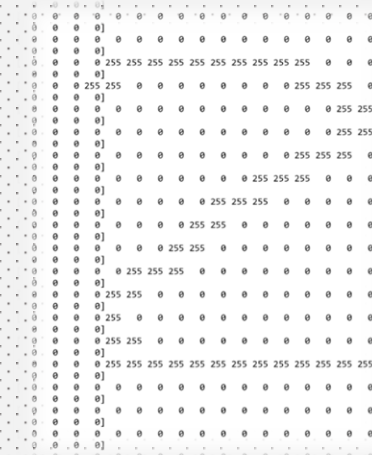
2.08 Making an Image Transition Application

2.09 Replacing ROIs & Transparent Images

2.10 Bitwise Operations & Basic Thresholding

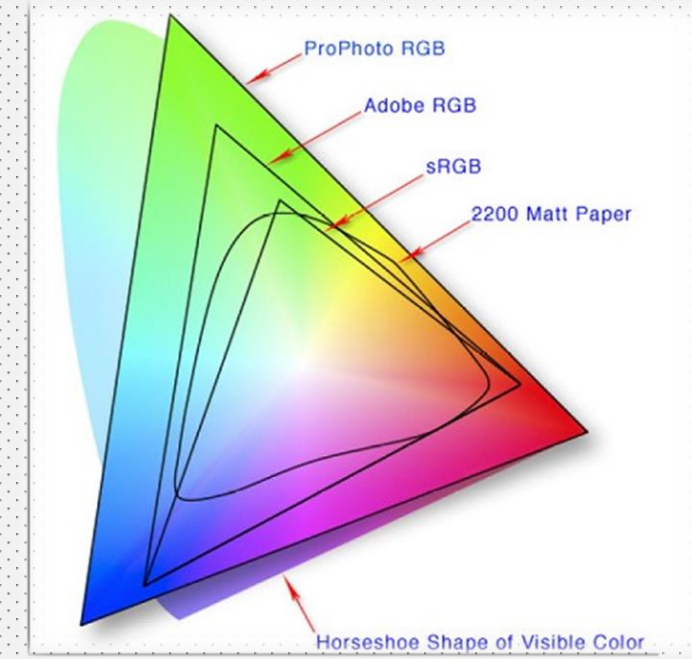
2.11 Overlaying Logo With Removed Background

Week 2 Quiz



WEEK 3: IMAGE PROCESSING PT 1

- 3.00 Week 3 Introduction
- 3.01 Brightness & Contrast Enhancement
- 3.02 Advance Thresholding
- 3.03 Image Filtering & Convolution
- 3.04 Blurring Methods
- 3.05 Cartoonify Photos



WEEK 3: IMAGE PROCESSING PT 1 (CONTD)

3.06 Color Spaces & Color Models Theory

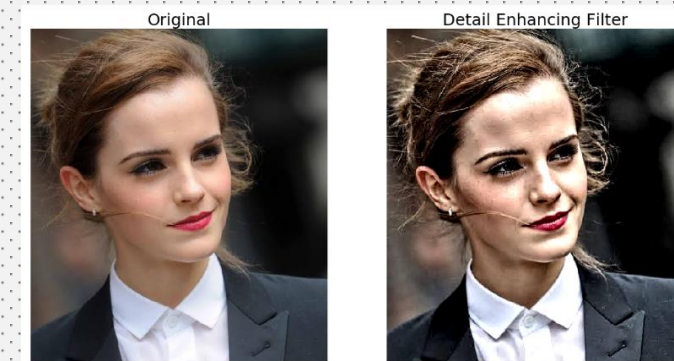
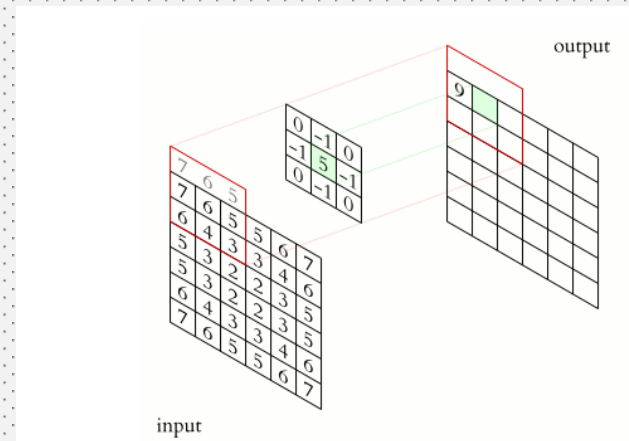
3.07 Image Gradients

3.08 Edge Detection with First & Second Order Derivatives

3.09 Canny Edge Detector Theory

3.10 Canny Edge Detector in OpenCV

Week 3 Quiz



WEEK 4: IMAGE PROCESSING PT 2

4.00 Week 4 Introduction

4.01 Morphological Operations

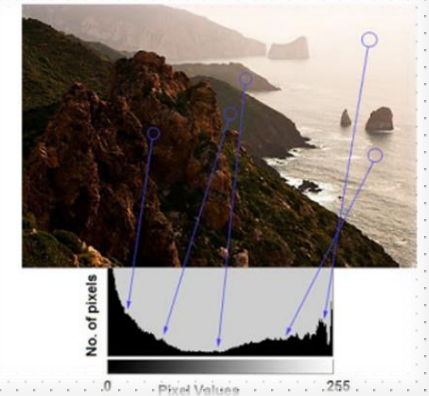
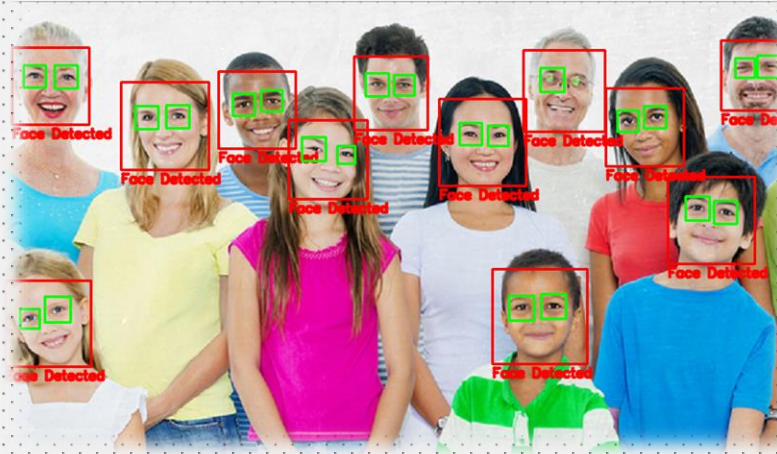
4.02 Blur Detection

4.03 Haar Cascades

4.04 Cat, Car & Pedestrian Detection With Optimization

4.05 Histograms

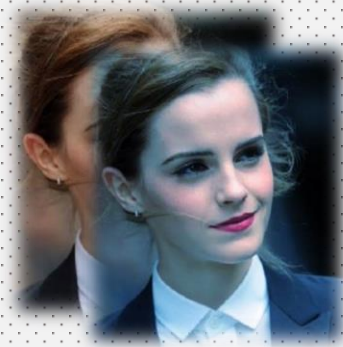
4.06 Histogram Equalization



WEEK 4: IMAGE PROCESSING PT 2 (CONTD)

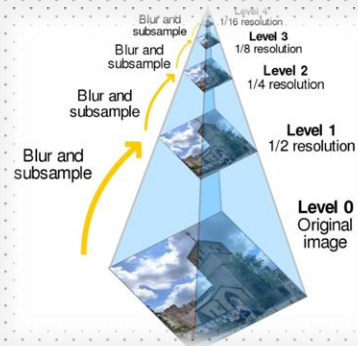
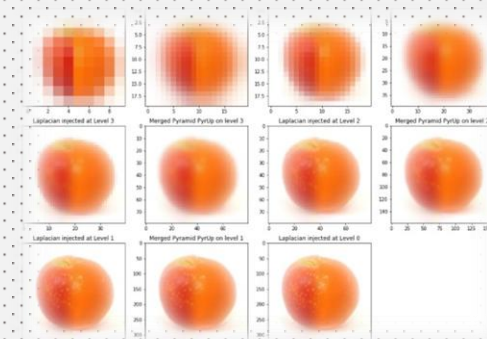
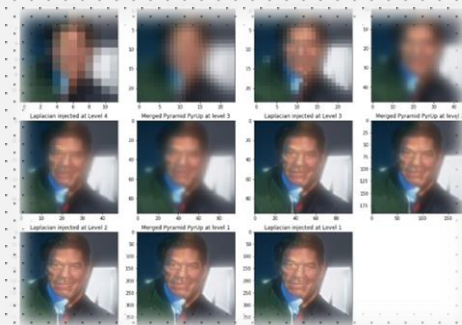
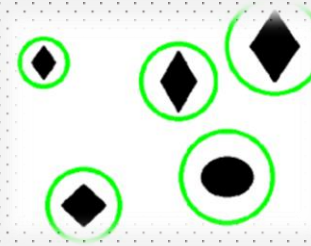
- 4.07 Histogram Backprojection
- 4.08 Finding Dominant Color in Image
- 4.09 LookUpTables & Gamma Correction
- 4.10 ColorMaps
- 4.11 Advance Color Adjustment

Week 4 Quiz



WEEK 5: IMAGE PROCESSING PT 3

- 5.00 Week 5 Introduction
- 5.01 Geometric Transformations
- 5.02 Image Pyramids
- 5.03 Pyramid Blending
- 5.04 Seamless Cloning
- 5.05 Facial Cloning
- 5.06 Blob Detection



WEEK 5: IMAGE PROCESSING PT 3 (CONTD)

5.07 Contours

5.08 Contours, More Functions

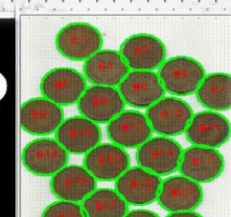
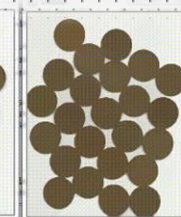
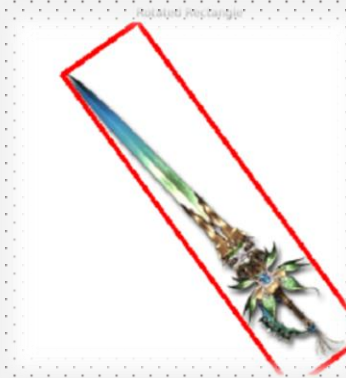
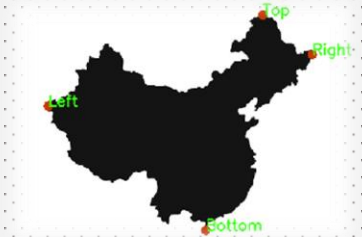
5.09 Contour Analysis

5.10 Static Background Subtraction

5.11 Smart Background Subtraction

5.12 Car detection with Background Subtraction

Week 5 Quiz



WEEK 6: CLASSICAL VISION APPLICATIONS

6.00 Week 6 Introduction

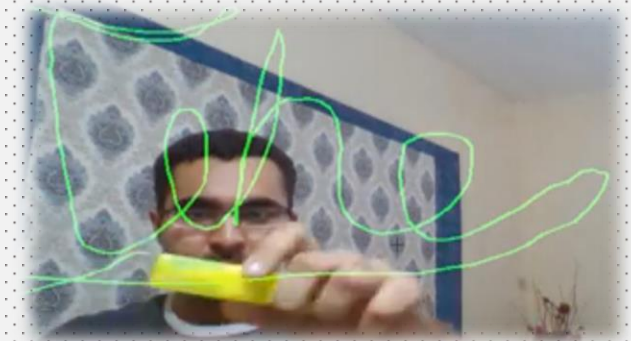
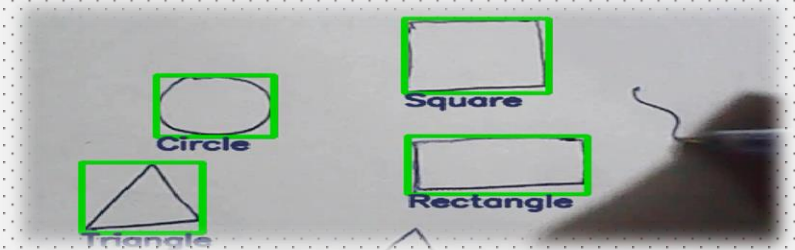
6.01 Shape Detection Application pt 1 (On Images)

6.02 Shape Detection Application pt 2 (On GUI & Web cam)

6.03 Creating a Virtual Pen & Eraser

6.04 Building the Harry Potter Invisibility Cloak

6.05 Creating a Virtual Drum



WEEK 7: GUI AUTOMATION, SEGMENTATION & HOUGH TRANSFORMS

7.00 Week 7 Introduction

7.01 Template Matching

7.02 GUI Automation with PyAutoGUI

7.03 Making Computer Vision Game Bots

7.04 Image Inpainting

7.05 Image Segmentation with GrabCut Algorithm

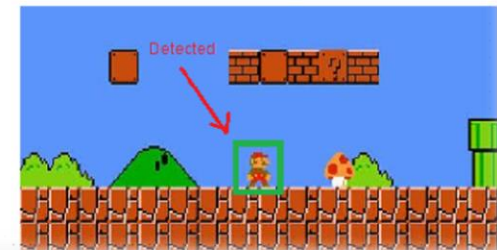


Searches the template image in the main image using a sliding window

Template Image



Main Image



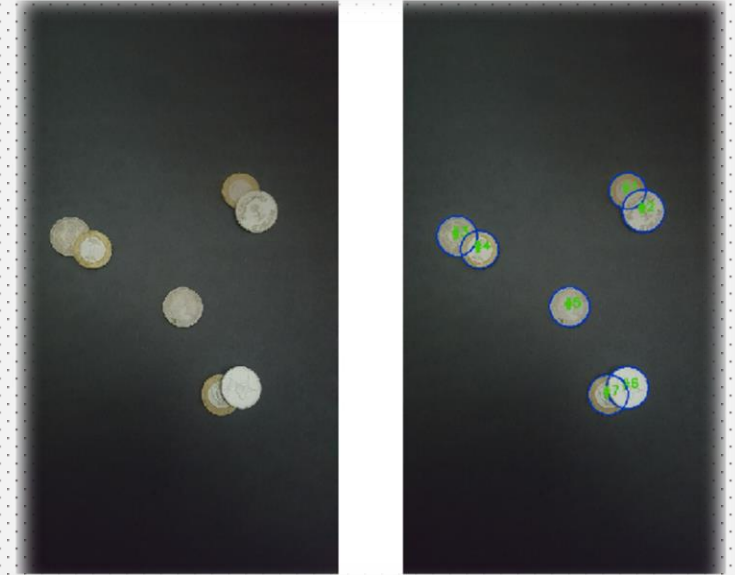
WEEK 7: GUI AUTOMATION, SEGMENTATION & HOUGH TRANSFORMS (CONTD)

7.06 Image Segmentation with Watershed Algorithm

7.07 Hough Transforms

7.08 Hough Lines & Circles

Week 7 Quiz



WEEK 8: FEATURE DETECTORS & DESCRIPTORS

8.00 Week 8 Introduction

8.01 What Are Image Features?

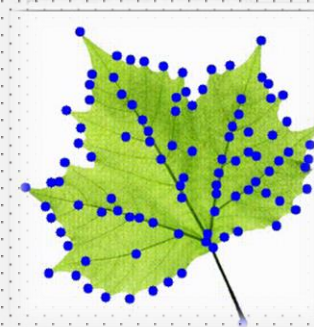
8.02 Corner Detection

8.03 Feature Detectors & Descriptors In OpenCV

8.04 ORB (Object Oriented FAST & Rotated BRIEF) Theory

8.05 Feature Matching

8.06 Real Time Image Classification With Feature Matching



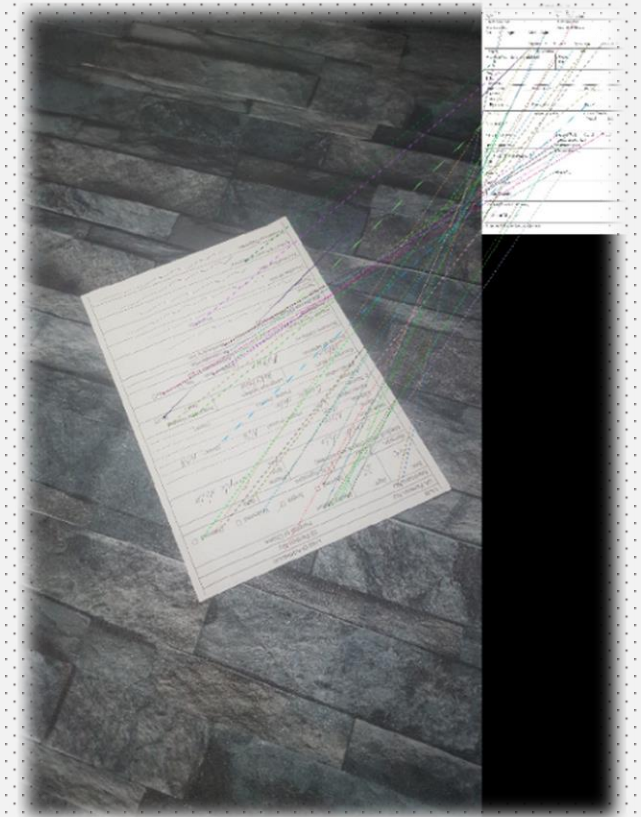
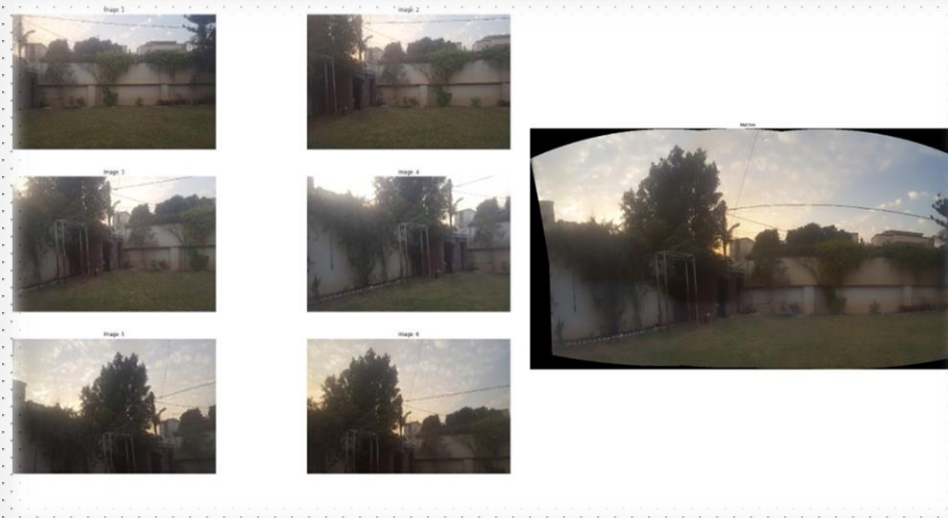
WEEK 8:FEATURE DETECTORS & DESCRIPTORS

8.07 Real Time Object Detection With Image Features

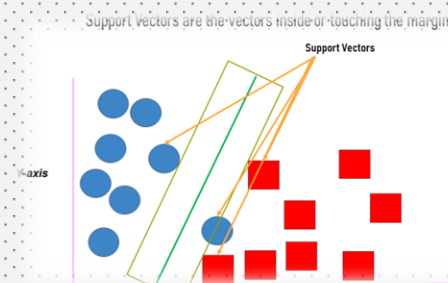
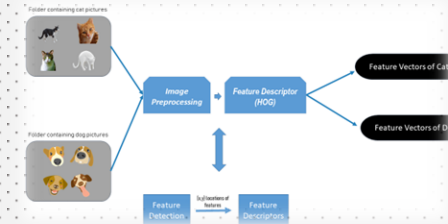
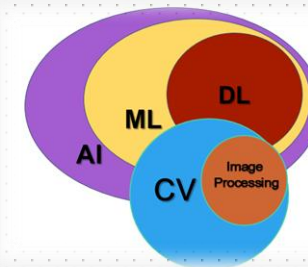
8.08 Creating A Panorama

8.09 Feature Based Image Alignment

Week 8 Quiz



WEEK 9: MACHINE LEARNING



9.00 Week 9 Introduction

9.01 Introduction To Artificial Intelligence

9.02 Image Classification With AI, ML and DL

9.03 Histogram Of Oriented Gradients

9.04 Support Vector Machines (SVMs)

9.05 Image Classification With HOG + SVM

9.06 Training a Custom ASL Classifier

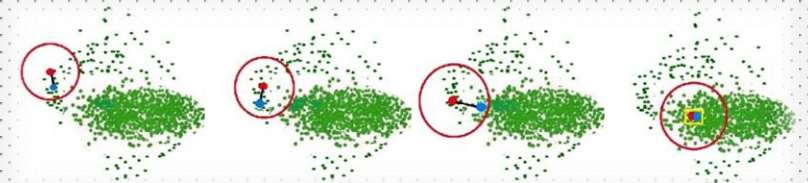
9.07 Training a Pedestrian Detector with HOG+SVM

Week 9 Quiz



WEEK 10: OBJECT TRACKING

- 10.00 Week 10 Introduction
- 10.01 Object Tracking Introduction
- 10.02 Meanshift & Camshift
- 10.03 Optical Flow Theory
- 10.04 Optical Flow In OpenCV
- 10.05 Modern Trackers In OpenCV
- 10.06 Object Tracking In OpenCV With Tracker API



WEEK 10: OBJECT TRACKING (CONTD)

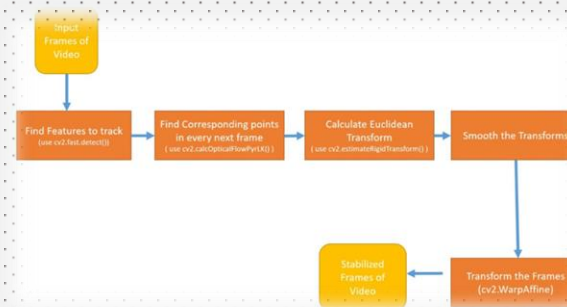
10.07 Multiple Object Tracking In OpenCV

10.08 Comparing Different Trackers

10.09 Video Stabilization In OpenCV

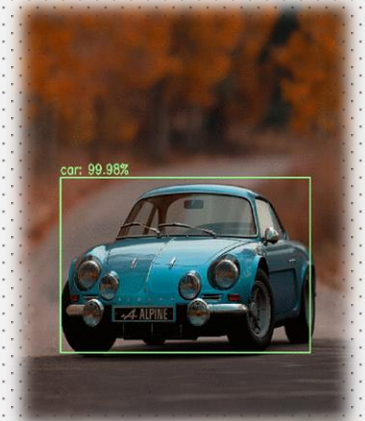
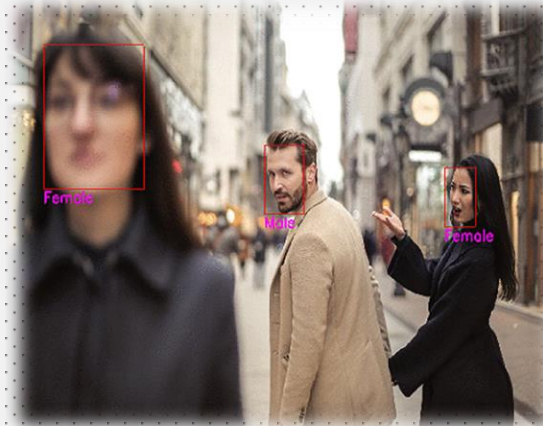
10.10 Video Stabilization With Vidstab

Week 10 Quiz



WEEK 11: DEEP LEARNING WITH DNN MODULE

- 11.01 Image Classification with GoogleNet
- 11.02 Object Detection with SSD (Single Shot Multibox detector)
- 11.03 Object Detection with YOLO (You Only Look Once).
- 11.04 Deep learning based Face Detection
- 11.05 Age Detection
- 11.06 Gender Detection
- 11.07 Hand Keypoints Detection
- 11.08 Text Detection



WEEK 11: DEEP LEARNING WITH DNN MODULE (CONTD)

- 11.09 Pose Detection
- 11.10 Style Transfer
- 11.11 Image Segmentation with Mask-RCNN
- 11.12 Image Colorization
- 11.13 Facial Expression Recognition
- 11.14 Super Resolution

Week 11 Quiz



I'm biased but still I can Confidently say that this is one of the most Practical, Comprehensive & Applied Computer Vision Course out there. Its taken my team more than a year to design all the Jupyter notebooks for this course, making sure that any student with just a descent programming experience can understand all the concepts presented and be able to build Powerful Applications.



Start Now, sometimes later becomes Never

Ready To Start your Journey in Vision:

[Click here to Sign Up for the Course](#)

For any Queries [Contact us here](#) or mail at ***Support@bleedai.com***

