

# 1 Week Image Processing Using OPENCV Python (Course Content)

## ❖ PROJECTS to Covered

- Object Tracking By Color
- Face/Smile/Eyes Detection from Image/Webcam
- BGR Palette with Trackbars
- Image Blending
- Applying Different Filters on Image
- Image Sharpening and Smoothing
- Edge Detection
- Image Blurring

## ❖ Highlights of Training

1. Applying Different Operations on Images
2. Human Face/Smile/Eyes Detection
3. Object Tracking by Color
4. Image Blurring and Sharpening
5. Different Blurring Techniques on Images
6. Different Filters on Images

## Course Content

### ❖ PYTHON

- Knowing Python
- Installing the Environment
- Getting familiar to Python IDE
- Why prefer python over others

### ❖ EXPRESSIONS & OPERATORS

- Python Syntax
- Including Comments, Indentation
- Python Variables
- Operators & Python Keywords

## ❖ PYTHON DATA TYPES

- Data: Numeric - int, float, long, complex
- Strings properties, methods, indexing, sequencing slicing, finding string in strings, finding string in string with numbers . . .
- Lists, Tuples, Dictionary

## ❖ PYTHON FOR DATA ANALYSIS-NUMPY

- Introduction to Numpy
- Numpy Arrays
- Quick Note on Array Indexing
- Numpy Array Indexing and Operations

## ❖ INTRODUCTION TO OPENCV

- What is OpenCV
- Installing OpenCV-Python

## ❖ GETTING STARTED WITH IMAGES

- Image Databases
- Reading an Image with different modes
- Displaying an Image
- Writing an Image to different path

## ❖ IMAGES & NUMBERS

- Understanding Images as Matrices and numbers
- Image Shape & Dimension
- Size of image

## ❖ GETTING STARTED WITH WEBCAM & VIDEOS

- Using Webcam
- Webcam Resolution
- Capture Image Using Webcam
- Capture Video from Camera
- Playing Video from file
- Saving a Video

## ❖ DRAWING FUNCTIONS IN OPENCV

- Creating an Image
- Drawing Line
- Drawing Rectangle
- Drawing Circle
- Drawing Ellipse
- Drawing Polygons
- Adding Text to Images

## ❖ MATPLOTLIB AND COLORMAPS

- Image Plotting using Matplotlib
- Understanding different color maps
- Understanding different color spaces
- Plotting Multiple Images through Matplotlib

## ❖ BASIC OPERATIONS ON IMAGES

- Accessing and Modifying pixel values
- Accessing Image Properties
- Image ROI
- Splitting and Merging Image Channels

## ❖ ARITHMETIC OPERATIONS ON IMAGES

- Arithmetic Operations on Image
- Image Blending
- Bitwise Operations
- Image Transition