

# AI Courses by OpenCV

# COMPUTER VISION I

## Module 1 : Getting Started with OpenCV

1. Introduction to computer vision
2. Basic image operations
3. Mathematical operations on images
4. Sunglass filter : A simple application
5. Bitwise operations
6. Image Annotation
7. QR code detection

## Module 2 : Video IO and GUI

1. Video IO using HighGUI
2. Keyboard as input device
3. Using the mouse for image annotation
4. Adding trackbar controller to your OpenCV application

## Module 3 : Binary Image Processing

1. Thresholding
2. Erosion / Dilation
3. Implementing morphological operations from scratch.
4. Opening and Closing
5. Connected Component Analysis
6. Contour Analysis
7. Blob Detection
8. Coin Detection

## Module 4 : Image Enhancement and Filtering

1. Color Spaces
2. Color Transforms
3. Image Filtering
4. Image Smoothing
5. Image Gradients
6. Autofocus Application

## Module 5 : Advanced Image Processing and Computational Photography

1. Hough Transforms
2. High Dynamic Range Imaging
3. Seamless Cloning
4. Image Inpainting

## Module 6 : Geometric Transforms and Image Features

1. Affine Transform
2. Homography
3. Image Features
4. Feature Matching
5. Image Alignment
6. Creating Panoramas
7. Finding known objects in an image
8. Selfie Application 1:
  - Instagram Filters
  - Blemish Removal
  - Green Screening

## Module 7 : Image Segmentation and Recognition

1. Image segmentation using GrabCut
2. Introduction to AI
3. Object Detection
4. Image Classification

## Module 8 : Video Analysis

1. Motion Estimation using Optical Flow
2. Object Tracking
3. Kalman Filtering
4. Meanshift and Camshift

## Module 9 : Deep Learning with OpenCV

1. Image Classification
2. Object Detection
3. Face Detection
4. Human Pose Estimation
5. Selfie Application
  - Skin smoothing
  - Sunglass filter
6. Document Scanner
7. Detection and Tracking