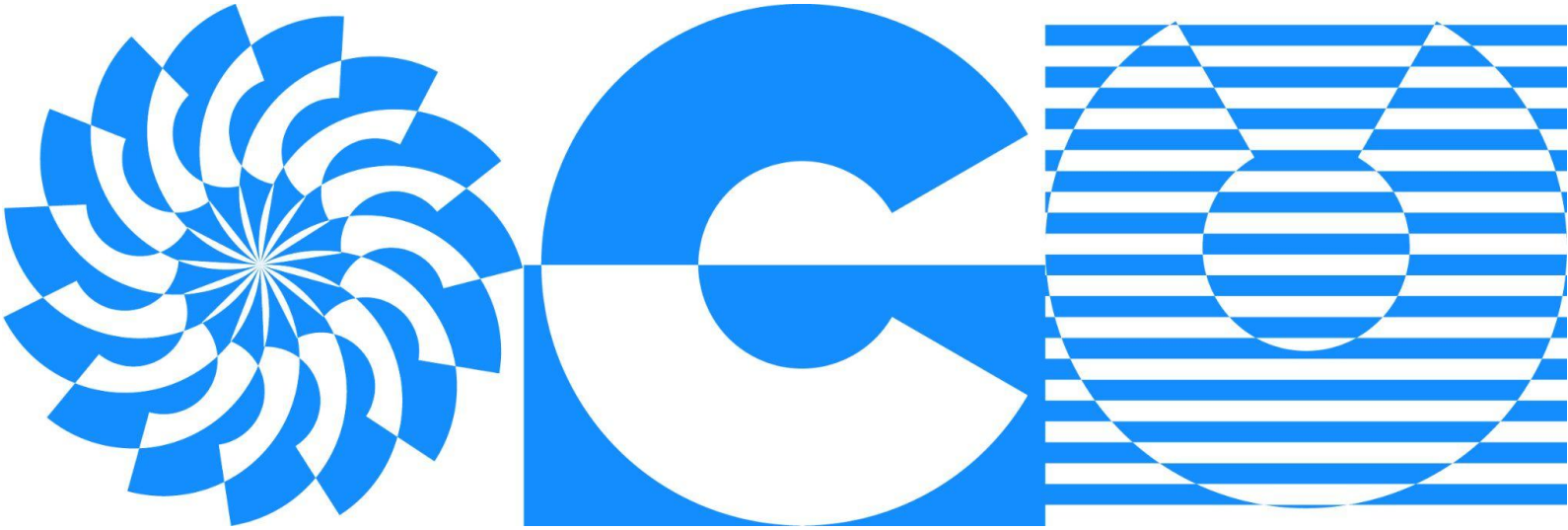
A place where legacy creates future.



MOCV

Mastering OpenCV with Python

Detailed Curriculum

OpenCV University

1. **Getting Started With Images**
   - 1.1. Image Basics (Basics of Image Formation and Image Formats)
   - 1.2. Reading, Display and Writing Images in OpenCV
   - 1.3. Color space conversion and different color spaces
   - 1.4. Basic image manipulation (resizing, cropping, annotating, creating a Region of Interest)

2. **Basic Image Operations**
   - 2.1. Mathematical operations on images (brightness and contrast)
   - 2.2. Image thresholding, bitwise operations and masking
   - 2.3. Image blending and the alpha channel
   - 2.4. Creating Digital signatures using alpha blending

3. **Histograms and Color Segmentation**
   - 3.1. Image histograms and enhancement using Histogram equalization
   - 3.2. Color segmentation on images
   - 3.3. Deforestation analysis using Color Segmentation
   - 3.4. Satellite Imagery analysis using GeoTIFF Images

4. **Video Processing and Analysis**
   - 4.1. Reading and Writing videos using OpenCV
   - 4.2. Motion Detection analysis using Background Subtraction

5. **Contours and Shape Analysis**
   - 5.1. Finding and Drawing Contours
   - 5.2. Intruder detection using Contour Analysis

6. **Human Computer interaction(HCI) using PyAutoGUI**
   - 6.1. Keyboard and Mouse Controls using PyAutoGUI
   - 6.2. Playing Online Games using PyAutoGUI

7. **Building and Deploying Apps with Streamlit**
   - 7.1. Building a Face detection application using streamlit
   - 7.2. Deploying streamlit apps on Streamlit cloud
   - 7.3. App Deployment on Heroku

8. **Image Filtering and Enhancement**
   - 8.1. Image Filtering using Convolution Operations
   - 8.2. Image Blurring and sharpening using convolutions
   - 8.3. Edge Detection using Sobel Filters and Canny algorithm
   - 8.4. Artistic Renderings using Image Filters

9. **Hough Transforms**
   - 9.1. Detecting Lines using Hough Lines
   - 9.2. Lane detection using using Hough Transforms from videos

10. **Image Restoration Techniques**
   - 10.1. Noise Reduction using Median and Bilateral Filters
   - 10.2. Image Inpainting for Image Restoration
   - 10.3. Building a streamlit application on image restoration using Inpainting.

11. **Image Registration Techniques**
   - 11.1. Affine Transforms and Homography
   - 11.2. Image Alignment using Homography and Feature Matching
   - 11.3. Building Virtual billboards and Creating Panoramas

12. **Augmented Reality**
   - 12.1. Overview of ArUco markers
   - 12.2. Application: AR using ArUco Markers

13. **Deep Learning using OpenCV**
   - 13.1. Introduction to OpenCv's DNN Module.
   - 13.2. Image classification using OpenCV DNN Module
   - 13.3. Web application for Image Classification

14. **Face and Landmark Detection**
   - 14.1. Face Detection using DNN Module
   - 14.2. Face Blurring
   - 14.3. Facial Landmarks Detection

14.4. Building a Real-time Blink Detection application

15. Object Detection

15.1. Object Detection using MobileNet SSD, YOLOv4 and YOLOv5

15.2. Building a Social Distance Monitoring Application

16. Object Tracking

16.1. Introduction on Object Tracking Models in OpenCV

16.2. Comparison across multiple tracking models.

17. Human Pose Estimation

17.1. Human Pose Estimation using MediaPipe

17.2. Sports Analytics using MediaPipe

18. Human Segmentation

18.1. Creating selfie-style photos using Person Segmentation through MediaPipe

19. Text Detection and OCR

19.1. Text Detection using EAST and Differentiable Binarization (DB)

19.2. OCR on Natural Images

19.3. Language Translation using OCR

20. Super Resolution

20.1. Image Super Resolution techniques using OpenCV

21. Deploying Web Applications on Cloud Services

21.1. Building web applications using streamlit

21.2. Deploying web applications using AWS, GCP, and Azure

Explore Other Courses