AI Courses by OpenCV

OPENCV FOR BEGINNERS

Module 1 : Getting Started with Images

1. Image Basics
    - Geometry of Image Formation
    - Digital Image Formation
    - Image Formats
2. Getting Started with Images
    - Reading, Displaying and Saving images
    - Color Images
    - Basic Image Manipulations
    - Annotating Images

Module 2 : Basic Image Operations

1. Arithmetic Operations on Images
    - Arithmetic Operations on Images
    - Thresholding in Images
    - Logical Operations on Images
2. Alpha Channel
    - Understanding and Using the Alpha Channel
3. Applications
    - Application 1: Creating Watermarks

- Application 2: Creating Digital Signature

Module 3 : Histograms and Color Segmentation

1. Histograms and Color Segmentation
    - Histograms
    - Color Segmentation
2. Applications
    - Deforestation using Color Segmentation
    - Analyzing Satellite Imagery using GeoTIFF Images

Module 4 : Video Processing and Analysis

1. Video Processing
    - Reading and Streaming Videos
    - Writing Videos
    - Motion Detection in Videos

Module 5 : Contour and Shape Analysis

1. Contour and Shape Analysis
    - Finding and Drawing Contours
2. Applications
    - Application: Intruder Detection
    - Notification using a Telegram Bot

Module 6 : Playing Games Using CV (HCI)

1. PyAutoGUI Overview
    - Introduction to HCI with PyAutoGUI
2. Applications

- Playing Online Games with Faces

Module 7 : Building and Deploying Web Apps with Streamlit

1. Creating Web Applications using Streamlit
    - Introduction to Streamlit
    - Face Detection Web App using Streamlit
2. Deploy Streamlit Applications to cloud
    - App Deployment using Streamlit Share
    - App Deployment using Heroku

Module 8 : Image Filtering and Enhancement

1. Introduction to Image Filtering
    - Basics of Image Filtering
    - What is Convolution
2. Image Smoothing and Sharpening
    - Image Smoothing and Sharpening using Convolution
3. Edge Detection
    - Edge Detection Methods: Sobel and Canny
4. Application: Build Photoshop-like Filters
    - Photoshop-like Artistic Filters
    - Build a Web App for Artistic Filters

Module 9 : Lane Detection using Hough Transform

1. Lane Detection using Hough Transform
    - Detecting Lines using Hough Transform in images
    - Lane Detection in Videos

Module 10: Image Restorations Techniques

1. Image Restorations using Filtering and Inpainting
    - Noise Reduction using Filtering and Inpainting
    - Fix Images using Inpainting
2. Application: Image Restoration App

Module 11: Image Registration Techniques

1. Geometric Transformations and Image Features
    - Color Photography and Image Alignment
    - Affine Transformations
    - Homography / Perspective Transform
    - Image Features
2. Image Registration using Homography and Feature Matching
    - Image Alignment Demo
3. Applications
    - Virtual Billboard
    - Creating Panoramas

Module 12: ArUco Markers for Augmented Reality

1. Introduction to ArUco Markers
    - ArUco Markers Overview
2. Application: Augmented reality using ArUco Markers

Module 13: Deep Learning with OpenCV

1. OpenCV DNN Module
    - Introduction to Deep Learning with OpenCV
    - Image Classification using OpenCV DNN Module
2. Application: Build A Web App to Classify Images

Module 14: Face and Landmark Detection

1. Face Detection in OpenCV
    - Face detection using OpenCV DNN Module
2. Detecting Facial Landmarks
    - Facial Landmark Detection using OpenCV
    - Application: Blink Detection

Module 15: Object Detection

1. Object Detection in OpenCV
    - Object detection using SSD MobileNet
    - Object detection using YOLOv4
    - Object detection using YOLOv5
2. Application
    - Social Distance Monitoring

Module 16: Object Tracking

1. Object Tracking in OpenCV
    - Introduction to Object Tracking
    - Analyzing Object Tracking methods

Module 17: Human Pose Estimation

1. Human Pose Estimation using Mediapipe
    - Introduction to Mediapipe for Human Pose Estimation
2. Application: Sport Analysis
    - Golf Swing analysis and Training

Module 18: Person Segmentation

1. Person Segmentation using Mediapipe
    - Implementing Portrait Mode and Color Pop

Module 19: Text Detection and OCR

1. Text Detection and Recognition
    - Text Detection using OpenCV DNN
    - Text Recognition using Natural Scenes
2. Application: Build a Language translation App
    - Translate language in images

Module 20: Super Resolution

1. Super Resolution in OpenCV

Module 21: Deploying Applications on the Cloud

1. Google Cloud Deployment
    - GCP Account Setup
    - Deploy Web App on AWS
2. Amazon Web Services
    - AWS Account Setup
    - Deploy Web App on AWS
3. Microsoft Azure
    - Azure Account Setup
    - Deploy Web APP on Azure