PANTECH SOLUTIONS®
Technology Beyond the Dreams

AI Master Class series — Day 7

Face recognition using Computer Vision

Installing Libraries

OpenCV-Contrib: pip install opencv-contrib-python

```
C:\Windows\system32>pip install opencv-contrib-python
Collecting opencv-contrib-python
  Using cached opencv_contrib_python-4.4.0.44-cp37-cp37m-win_amd64.whl (40.1 MB)
Requirement already satisfied: numpy>=1.14.5 in c:\program files (x86)\microsoft visual studio\shared\pyth
te-packages (from opencv-contrib-python) (1.19.2)
Installing collected packages: opencv-contrib-python
Successfully installed opencv-contrib-python-4.4.0.44
```

Face recognition.

Face recognition is a method of identifying or verifying the identity of an individual using their face. Face recognition systems can be used to identify people in photos, video, or in real-time.

- Preventing crime
- Unlock device
- Blind assistance
- Attendance system
- Payments

Fisherface Recognizer.

- Fisherfaces algorithm extracts principle components that separates one individual from another. So , now an individual's features can't dominate another person's features.

- Fisherface method will be applied to generate feature vector of facial image data used by system and then to match vector of traits of training image with vector characteristic of test image using euclidean distance formula
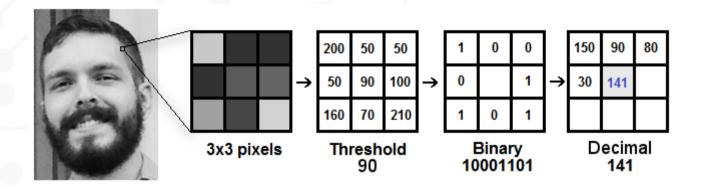
LBPHFaceRecognizer.

Local Binary Pattern (LBP) is a simple yet very efficient texture operator which labels the pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number.
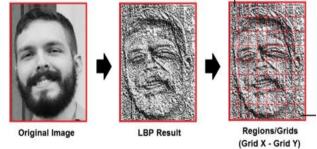
It doesn't look at image as a whole, but instead tries to find its local structure by comparing each pixel to its neighboring pixels.
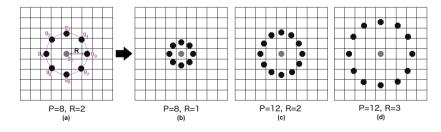
LBPH uses 4 parameters

- **Radius** – to build the circular local binary pattern and represents the radius around the central pixel. It is usually set to 1.
- **Neighbors** – : The more sample points you include, the higher the computational cost. It is usually set to 8
- **X Grid** – the number of cells in the horizontal direction.
- **Y Grid** – the number of cells in the vertical direction.

200	50	50
50	90	100
160	70	210

3x3 pixels

→

1	0	0
0		1
1	0	1

Threshold 90

→

Binary 10001101

150	90	80
30	141	

Decimal 141

Original Image → **LBP Result** → **Regions/Grids (Grid X - Grid Y)**

Circular LBP

P=8, R=2
(a)

P=8, R=1
(b)

P=12, R=2
(c)

P=12, R=3
(d)
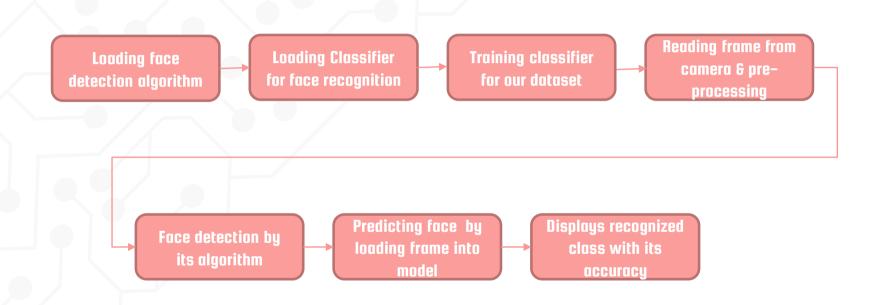
Block Diagram — Workflow of Face recognition.

Loading face detection algorithm → Loading Classifier for face recognition → Training classifier for our dataset → Reading frame from camera & pre-processing

Face detection by its algorithm → Predicting face by loading frame into model → Displays recognized class with its accuracy

Practical session

Creating Dataset

Face Recognition

Today's Short Bytes — Tech News

AI Art – Kolkata Exhibition to Showcase Artworks Created With Assistance of A.I

Thanks!

Connect with me on **Linkedln:**
 link in Description

Product & Project:
www.pantechsolutions.net

Course:
Learn.pantechsolutions.net

Tomorrow session

Face Emotion using OpenCV