Project 2 : Face Recognition from image

Every Machine Learning algorithm takes a dataset as input and learns from this data. The algorithm goes through the data and identifies patterns in the data. For instance, suppose we wish to identify whose face is present in a given image, there are multiple things we can look at as a pattern:

- Height/width of the face.
- Height and width may not be reliable since the image could be rescaled to a smaller face. However, even after rescaling, what remains unchanged are the ratios – the ratio of height of the face to the width of the face won't change.
- Color of the face.
- Width of other parts of the face like lips, nose, etc.

Clearly, there is a pattern here – different faces have different dimensions like the ones above. Similar faces have similar dimensions. The challenging part is to convert a particular face into numbers – Machine Learning algorithms only understand numbers. This numerical representation of a "face" (or an element in the training set) is termed as a feature vector. A feature vector comprises of various numbers in a specific order.

APPLICATIONS

1. Facial Authentication: Apple has brought in Face ID for Facial Authentication in iPhones. Some of the leading banks are trying to use Facial Authentication for lockers.
2. Customer Service: Some of the banks in Malaysia have installed systems which use Face Recognition to detect valuable customers of the bank so that the bank can provide the personalized service. This way, banks are able to generate more revenues by retaining such customers and keeping them happy.
3. Insurance Underwriting: Many insurance companies are using Face Recognition to match the face of the person with that provided in the photo ID proof. This way, the underwriting process becomes much faster.

LIMITATIONS

1. Poor Image Quality Limits Facial Recognition's Effectiveness.

2. Small Image Sizes Make Facial Recognition More Difficult.

3. Different Face Angles Can Throw Off Facial Recognition's Reliability.

4. Data Processing and Storage Can Limit Facial Recognition Tech.

DIAGRAM

Phase 3: Recognition

Mary ← id = 1

id = 2 → Steve

Phase 1: Data Gathering

id = 1

OpenCV python

Phase 2: Train the Recognizer

dataset

id = 1

id = 2

Recognizer

Trainer