**Facial Detection and Recognition with Python**

**Objective**

The primary objective of this project is to develop a robust facial detection and recognition system using Python. We aim to accurately detect faces in images and associate them with known identities.

**Problem Statement**

Given an input video stream, our system should be able to:

* Detect faces within the image.
* Recognize and label each detected face with the corresponding identity (if known).

**Solution**

Our solution involves the following steps:

1. **Face Detection**:
   * Utilize pre-trained deep learning models (such as Haar cascades or deep neural networks) to identify regions of interest (ROIs) containing faces.
   * Extract facial features and create bounding boxes around detected faces.
2. **Face Recognition**:
   * Using python libraries to convert facial images into simpler formats. [Numpy ndarray]
   * Use techniques like deep metric learning to learn embeddings for each face.
   * Compare embeddings to recognize faces based on similarity scores.

**Literature Review**

* + Explore existing research papers and articles related to facial detection and recognition.
  + Understand the state-of-the-art methods and algorithms.

**Tools and Libraries**

* + Python: The primary programming language for implementation.
  + OpenCV: For face detection and image processing.
  + Dlib: For face recognition.

**Testing Data**

* + Collect a diverse dataset of labeled face images.
  + Split the dataset into training and validation sets.

**Future Scope**

* + Extend the project to real-time face recognition using webcam feeds.
  + Improve accuracy by fine-tuning the model or exploring ensemble methods.
  + Explore privacy implications and ethical considerations.

**Technology Used**

* + Python
  + OpenCV
  + Dlib
  + Deep Learning

**GitHub Repository Link**

[**https://github.com/AkshatRauthan/PBL\_Final\_Project**](https://github.com/AkshatRauthan/PBL_Final_Project)

**Team Members**

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