**PROJECT REPORT**

* **TOPIC:-** Facial Recognition project using LFW (Labelled Faces in the Wild) dataset.
* **OBJECTIVE:-** The objective of the Facial Recognition Project using the Labeled Faces in the Wild (LFW) Dataset is to develop and evaluate a robust facial recognition system that can accurately identify and verify individuals based on their facial features.
* **About the dataset-**

**Purpose and Creation:**

* LFW is a benchmark dataset created to facilitate research in the field of facial recognition and face verification.
* It was introduced in 2007 by researchers at the University of Massachusetts, Amherst.

**Dataset Composition:**

* The dataset contains over 13,000 labeled images of faces collected from the internet.
* These images represent 5,749 distinct individuals, with each image labeled with the name of the person depicted.
* The dataset includes a wide range of variations in terms of lighting, pose, expression, age, and gender.

**Face Verification Protocol:**

* LFW is primarily used for the task of face verification, where the goal is to determine whether two images represent the same person.
* The dataset is often split into training and testing sets, with 6,000 face pairs used for evaluation (3,000 matching pairs and 3,000 non-matching pairs).

**Variability and Challenges:**

* The images in LFW are not taken in controlled environments, making the dataset challenging due to variations in background, lighting, occlusions, and facial expressions.
* The images reflect real-world conditions, making it an excellent benchmark for evaluating the robustness of facial recognition systems.

**Preprocessing Requirements:**

* Researchers often need to preprocess the images to align faces, normalize pixel values, or extract facial features using methods like Histogram of Oriented Gradients (HOG) or deep learning techniques.

**Use in Machine Learning:**

* LFW has been widely used to train and evaluate various facial recognition algorithms, from traditional machine learning methods like Support Vector Machines (SVMs) to modern deep learning models, including Convolutional Neural Networks (CNNs).
* **Phases of Project-**

Here are the key phases of the Labeled Faces in the Wild (LFW) dataset:

1. **Data Collection and Labeling:** Images of faces were collected from the web and manually labeled with the corresponding individual's name.
2. **Preprocessing and Pair Matching:** Faces were detected, aligned, and normalized; the dataset was structured into matched and mismatched pairs for face verification tasks.
3. **Model Training and Development:** Models were trained using various techniques, from traditional machine learning to deep learning, to perform face verification.
4. **Evaluation and Benchmarking:** Model performance was evaluated using verification accuracy, ROC curves, and AUC, establishing benchmarks for facial recognition systems.

* **ROLES AND RESPONSIBILITIES:-**

1.Project Leader-Tanisha Lalwani

Responsibilities:

* Planning and Setup of dataset on 18.08.24
* Define the project's objectives and scope.
* Create a timeline and assign roles to each member.
* Prepared any graphical assets needed.

2.Team Member 1: Aryan Shukla

Responsibilities:

* Repository Creation and Initial Development on 19.08.24
* Created the GitHub repository and added relevant dataset to the repository.
* Gather requirements and outline the content structure (e.g., documentation, code, assets).

3.Team Member 2: Kashish Singh

Responsibilities:

* Development and Collaboration was done on 20.08.24
* Continued developing features and make regular commits to their respective dataset.
* Communicated daily through a group chat or video call to ensure everyone is aligned on progress and next steps.
* Prepared graphical assets (if needed).

4.Team Member 3: Akanksha Pawar

Responsibilities:

* Finalization and Deployment of the project on 21.08.24
* Helped in creating and organizing project documentation and reports.
* Finalizing and uploading of design assets to the repository
* Conducted a final review meeting to gather feedback and make any last-minute adjustments.
* By dividing responsibilities and maintaining clear communication, the group can successfully create a GitHub repository of the project facial Recognition using LFW (Labelled Faces in the Wild) dataset.