Face Detection Attendance System

This is a Flask-based Face Detection Attendance System using OpenCV. It allows capturing student faces, training a model, and marking attendance based on facial recognition.

🚀 Features

- Real-time face detection using webcam
- Face dataset collection
- Model training using LBPH recognizer
- Attendance marking via face recognition
- Attendance report in CSV format
- Web-based interface
- Integration with Groq-powered LLaMA 3 chatbot (optional)

🛠️ Software Requirements

- **Python 3.8+**
- **pip** (Python package manager)
- **OpenCV**
- **Flask**
- **NumPy**
- **Pandas**
- **Pillow (PIL)**
- **Groq SDK** *(optional, for chatbot integration)*

🔧 Installation & Setup

1. **Download the code**
2. **Set up virtual environment (recommended)**
3. python -m venv venv
4. source venv/bin/activate   # macOS/Linux
5. .\venv\Scripts\activate   # Windows
6. **Install dependencies**

7. pip install -r requirements.txt

8. **Run the app**

python app.py

Then visit: http://127.0.0.1:5000/

🚀 Usage

- **Capture images**: http://127.0.0.1:5000/capture_image

- **Train model**: http://127.0.0.1:5000/train_model

- **Fill attendance**: http://127.0.0.1:5000/fill_attendance

- **Download report**: attendance.csv

📁 Project Structure

```
face-detection/
│
├── static/ ── CSS, JS assets
├── templates/ ── HTML pages
├── train_images/ ── Raw face captures
├── student_recognizer.yml ── Trained model
├── label_map.npy ── ID-to-name map
├── attendance.csv ── Output reports
├── app.py ── Main Flask app
├── requirements.txt ── Python deps
└── README.md ── This documentation
```