InsightfulProctor – Documentation

Overview

InsightfulProctor is an AI-powered proctoring solution designed to analyze images and video frames for remote interview or exam monitoring. It detects:

- Identity mismatches
- Suspicious objects
- Multiple faces
- Behavioral violations

using advanced computer vision and deep learning techniques.

Key Features

- **Face Verification**
  Uses DeepFace to match the candidate with their reference image.
- **Object Detection**
  Employs the YOLO model to identify gadgets, phones, screens, and printed materials.
- **Face & Gaze Analysis**
  Utilizes Mediapipe to estimate head pose and gaze direction for attention monitoring.
- **Hand Detection**
  Detects hand gestures and objects held by the candidate.
- **Scoring System**
  Assigns Green, Amber, or Red cards based on detected violations, with score tracking.
- **LLM Summaries**
  Generates concise, human-readable summaries using Azure OpenAI.
- **PDF Reporting**
  Exports violation frames and summaries into a professional PDF report.
- **Streamlit UI**
  Provides a user-friendly interface for uploading images/videos and viewing results.

Main Modules

- **face_verifier.py:** Verifies if two images belong to the same person.
- **detect.py:** Runs detection and analysis (faces, objects, gaze, head pose, hands).
- **scoring.py:** Implements scoring and card issuance logic.
- **pdf_report.py:** Generates a PDF report of violations.
- **app.py:** Streamlit app for user interaction and workflow orchestration.

Usage

- Upload Test Image/Video: Live webcam image or recorded video.
- Run Analysis: System processes frames, detects violations, assigns scores.
- Review Results: View summaries, violation details, and download PDF report.

Installation

Install dependencies using:

- `pip install -r requirements.txt`

How It Works

Each frame is analyzed for:

- Face count
- Identity verification
- Gaze direction
- Head pose
- Prohibited objects
- Violations are scored and summarized.
- Results are presented in the UI and can be exported as a PDF report.

Notes

- Requires Azure OpenAI credentials for LLM summaries.
- For best results, use clear, well-lit images and videos.