AI-Powered Real-Time Eye Blink Detection and Logging

■ Overview

This project is a computer vision and data science application that detects and logs eye blinks in real-time using **OpenCV** and **MediaPipe**. It leverages eye landmark tracking and calculates the Eye Aspect Ratio (EAR) to classify whether eyes are open or closed. Events are logged into a structured CSV file with timestamps, enabling further data analysis.

■ Features

- Real-time eye state detection (Open/Closed)
- Automatic event logging with timestamps
- Computer Vision + AI integration using OpenCV and MediaPipe
- CSV-based structured output for further data science analysis
- User-friendly real-time visualization through webcam feed

■ Tech Stack

- Python 3
- OpenCV
- MediaPipe
- Pandas
- NumPy

■ Installation & Usage

- Clone the repository and navigate to the project folder.
- Install dependencies: `pip install -r requirements.txt`
- Run the application: `python appp.py`
- Press 'Q' to exit the real-time detection window.
- Check the generated `logs.csv` file for recorded events.

■ Output

The system displays real-time status on screen ('Eyes Open' / 'Eyes Closed') and logs every detected event into `logs.csv` with timestamps for further data science analysis such as fatigue detection, anomaly tracking, or behavior monitoring.

■ Future Improvements

- Integrate drowsiness detection for driver monitoring systems
- Add real-time alerts (sound/vibration) on prolonged eye closure
- Build a dashboard for visual analytics of blink frequency and patterns
- Extend to multi-user eye state detection

■ Author

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