RUN-Procedure: Real-Time Drowsiness Detection

# Required Steps to Run the Project

This document outlines the necessary steps, tools, and procedures to successfully run the Real-Time Drowsiness Detection System using hybrid Computer Vision and Deep Learning techniques.

# Required Software

1. Python 3.x (recommended: 3.10+)  
2. CMake (for dlib build configuration) – check via `cmake --version`  
3. Microsoft Visual C++ Build Tools (for building dlib on Windows)  
4. Git (for cloning the repository)  
5. Webcam (for real-time video input)

# Dependencies / Libraries

Install the following Python libraries using pip:  
- numpy  
- imutils  
- scipy  
- dlib (use the provided .whl file)  
- twilio  
- opencv-python  
  
Example commands:  
```  
pip install numpy imutils scipy twilio opencv-python  
pip install path\to\dlib-19.24.99-cp312-cp312-win\_amd64.whl  
```

# Execution Steps

1. Clone or download the repository.  
2. Ensure all dependencies are installed.  
3. Place the following files in the same directory as your `main.py` file:  
 - shape\_predictor\_68\_face\_landmarks.dat  
 - haarcascade\_frontalface\_default.xml  
 - alarm.wav, yawn\_sound.wav, Danger.wav  
4. Update Twilio credentials in the code (`ACCOUNT\_SID`, `AUTH\_TOKEN`, etc.) if using SMS alerts.  
5. Run the application:  
```  
python main.py  
```

# Sample Test Case

Scenario: Driver closes eyes for more than 2 seconds.  
  
Expected Output:  
- Yellow eye contour for short drowsiness  
- Red contour and danger sound after prolonged drowsiness  
- "You are in danger!" message and SMS sent via Twilio (if configured)  
- Live video feed displays EAR, Yawn distance, and drowsy timer on screen

# Troubleshooting

- Issue: dlib installation error  
 Solution: Use the provided .whl file for your Python version and install via pip.  
  
- Issue: Twilio SMS not sending  
 Solution: Double-check API credentials and network access.  
  
- Issue: Webcam not starting  
 Solution: Ensure your camera is connected and not used by another application.  
  
- Issue: No alert sounds  
 Solution: Ensure your system volume is up and WAV files are correctly named and located.