How to Run the Online Exam Cheating Detection Application

This guide provides a detailed step-by-step process to run the Online Exam Cheating Detection System. Follow each step carefully to ensure the application works correctly.

1. Requirements

Before running the application, make sure you have the following:

- **Python 3.x** installed on your system.
- **Webcam and microphone** for live video and audio monitoring.
- **Internet connection** (required for loading the MobileNetV2 model weights).
- **Compatible Operating System:** The code supports both **Windows** and **macOS**.

2. Install Necessary Dependencies

The application relies on several Python libraries. Open a terminal (Command Prompt on Windows or Terminal on macOS) and run the following commands to install the required packages:

pip install opencv-python-headless numpy mediapipe pyaudio tensorflow psutil

```
sunny@Suryas-MacBook-Air DV % pip3 install opencv-python-headless numpy mediapipe pyaudio tensorflow psutil
Defaulting to user installation because normal site-packages is not writeable
Collecting opencv-python-headless
  Downloading opencv_python_headless-4.11.0.86-cp37-abi3-macosx_13_0_arm64.whl.metadata (20 kB)
Requirement already satisfied: numpy in /Users/sunny/Library/Python/3.12/lib/python/site-packages (1.26.4)
Requirement already satisfied: mediapipe in /Users/sunny/Library/Python/3.12/lib/python/site-packages (0.10.20)
Requirement already satisfied: pyaudio in /Users/sunny/Library/Python/3.12/lib/python/site-packages (0.2.14)
Requirement already satisfied: tensorflow in /Users/sunny/Library/Python/3.12/lib/python/site-packages (2.18.0)
Collecting psutil
  Downloading psutil-6.1.1-cp36-abi3-macosx_11_0_arm64.whl.metadata (22 kB)
Requirement already satisfied: absl-py in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from mediapipe
Requirement already satisfied: attrs>=19.1.0 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from med
Requirement already satisfied: flatbuffers>=2.0 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from
Requirement already satisfied: jax in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from mediapipe) (0
Requirement already satisfied: jaxlib in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from mediapipe)
Requirement already satisfied: matplotlib in /Library/Frameworks/Python.framework/Versions/3.12/lib/python3.12/site
Requirement already satisfied: opencv-contrib-python in /Users/sunny/Library/Python/3.12/lib/python/site-packages (
Requirement already satisfied: protobuf<5,>=4.25.3 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (fr
Requirement already satisfied: sounddevice>=0.4.4 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (fro
Requirement already satisfied: sentencepiece in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from med
Requirement already satisfied: astunparse>=1.6.0 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from
Requirement already satisfied: gast!=0.5.0,!=0.5.1,!=0.5.2,>=0.2.1 in /Users/sunny/Library/Python/3.12/lib/python/s
Requirement already satisfied: google-pasta>=0.1.1 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (fr
Requirement already satisfied: libclang>=13.0.0 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from
Requirement already satisfied: opt-einsum>=2.3.2 in /Users/sunny/Library/Python/3.12/lib/python/site-packages (from
Requirement already satisfied: packaging in /Library/Frameworks/Python.framework/Versions/3.12/lib/python3.12/site-
```

opencv-python-headless: For video processing without GUI support.

numpy: For numerical calculations.

mediapipe: For face detection and tracking.

pyaudio: For audio monitoring.

tensorflow: For object detection (e.g., phone detection).

psutil: For active application monitoring on Windows.

Additional Dependencies for macOS

If you're using macOS, install the following package for active application monitoring:

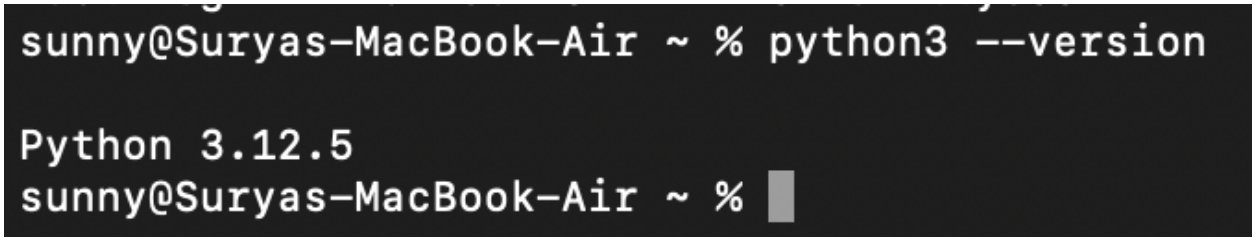
pip install pyobjc-framework-AppKit

3. Verify Python Version

Ensure you are using Python 3.x. Run the following command to check your Python version:

On windows: python --version

On Mac: python3 –version



4. Prepare the Source Code

- Place the source code in a dedicated folder for easy navigation.
- Ensure all the necessary modules are imported at the top of the script.
- Confirm that the MobileNetV2 model weights are loaded correctly from the internet.

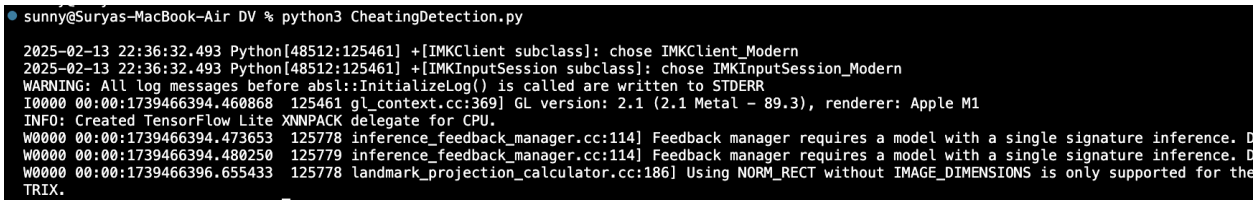
5. Run the Application

Execute the following command to start the application:

python CheatingDetection.py

If you're using macOS and installed Python via Homebrew, you might need to use python3 instead:

python3 CheatingDetection.py



6. Grant Necessary Permissions

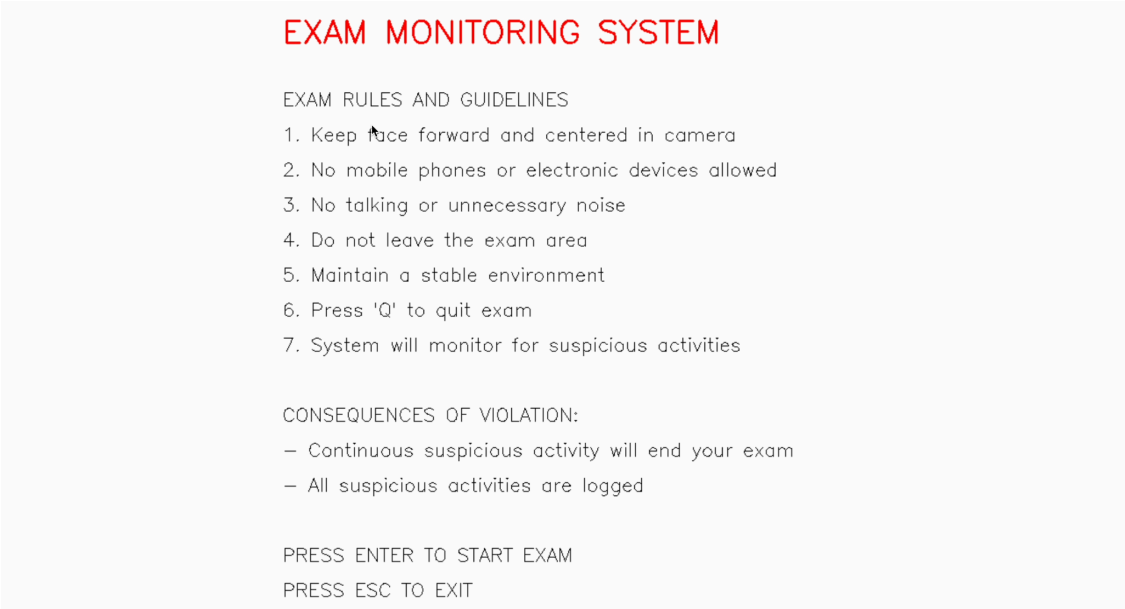
- On **macOS**, you may need to grant permission to access the camera and microphone. Go to **System Preferences > Security & Privacy** and allow camera and microphone access for the terminal.
- On **Windows**, make sure you have the necessary permissions for screen and microphone access under **Settings > Privacy**.

7. Instructions Screen

After running the application:

- The first screen displayed will be the **Exam Instructions** window, showing the rules and guidelines.
- To proceed:

- Press **Enter** to start the exam.
- Press **ESC** to exit the application.



8. During the Exam

The system uses the webcam and microphone to monitor the test-taker's behavior. It checks for:

- **Face Not Facing Front** – If the user looks away from the screen.
- **Person Missing** – If no face is detected for a certain duration.
- **Phone Detection** – If a mobile phone is visible in the camera frame.
- **Loud Noises** – If the ambient noise level is above a certain threshold.
- **Environment Change** – If there are significant changes in the background.

If suspicious behavior is detected, the system displays alerts and starts a countdown timer to end the exam if the activity persists.

9. Stopping the Exam

- You can manually stop the exam by pressing **Q** or the **Tab** key.
- If continuous suspicious activity is detected, the exam will end automatically, and the reason(s) for termination will be displayed on the screen.

10. Cleanup and Exit

Once the exam ends or is manually stopped:

- The application will automatically release the webcam and microphone resources.
- All windows will be closed, and the system will return to the terminal.

11. Troubleshooting Tips

- If the application fails to start, double-check that all dependencies are installed correctly.
- Ensure that the webcam and microphone are not being used by other applications.
- For macOS users, if the application crashes during the active application check, ensure that pyobjc-framework-AppKit is installed.

Conclusion

The Online Exam Cheating Detection System provides a robust and reliable solution for remote proctoring by using advanced computer vision and audio analysis techniques. It effectively detects and responds to suspicious activities to maintain exam integrity.

This detailed guide outlines the steps required to set up and run the application, making it easier for users to operate the system successfully.