**Information**

The OneDrive link contains two folders: one is the main system that runs the road accident detection program, and the other is the image classification model folder. The image classification folder includes the dataset used during model training and testing. Inside, there is a main dataset folder structured into train, valid, and test subfolders. Additionally, two separate test image folders are provided.

The model has undergone two training phases, including fine-tuning. Therefore, a fineTuneDataset folder is also included, which was used for the fine-tuning process. Model training was performed using a Kaggle notebook, and the notebook file is attached as well.

To start running the system, follow the instructions below.

[**README**](https://github.com/jmwongg/CP2_RoadAccidentDetection?tab=readme-ov-file)

**🚗 Road Accident Detection System**

This project is a road accident detection system using computer vision and deep learning models. It detects and tracks vehicles and accidents from video input.

**⚙️ Setup Instructions**

It is recommended to download the **CP2\_RoadAccidentDetection-main** folder and open it in a code editor like Visual Studio Code. Start setting up the environment by running the commands in your terminal. Note that Python version should be < 3.12 to accommodate the project.

**💻 Terminal Commands:**

**1. Create a Virtual Environment**

**Windows**

*python -m venv venv*

**2. Activate the environment**

**Windows**

*.\venv\Scripts\activate*

Once activated, your terminal will look like:  
(*venv) PS C:\Users\Wong Jia Mien\Downloads\CP2\_RoadAccidentDetection-main\CP2\_RoadAccidentDetection-main>*

**3. Install All requirements**

*pip install --upgrade pip  
pip install -r requirements.txt*

**4. Clone the YOLOv5 Repository and Install Dependencies**

*git clone https://github.com/ultralytics/yolov5.git   
cd yolov5  
pip install -r requirements.txt*

**5. Return to Root Directory and Run the Program**

*cd ..  
python main.py*

**✏️ Drawing Violation Area**

When the system starts, it will prompt you to draw a restricted area on the screen. This area is used to detect vehicle violations. If a vehicle enters this area, a violation message will be displayed.

**To draw the area:**

1. Click 4 points in clockwise order starting from the top-left corner of your desired polygon.
2. After drawing, close the window to proceed.
3. A confirmation window will show the drawn area.
4. Close it again to start video analysis.

[](https://private-user-images.githubusercontent.com/125172250/470683917-30f75a59-faf5-40e6-af90-3df995df2afa.png?jwt=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpc3MiOiJnaXRodWIuY29tIiwiYXVkIjoicmF3LmdpdGh1YnVzZXJjb250ZW50LmNvbSIsImtleSI6ImtleTUiLCJleHAiOjE3NTM0MzkwODMsIm5iZiI6MTc1MzQzODc4MywicGF0aCI6Ii8xMjUxNzIyNTAvNDcwNjgzOTE3LTMwZjc1YTU5LWZhZjUtNDBlNi1hZjkwLTNkZjk5NWRmMmFmYS5wbmc_WC1BbXotQWxnb3JpdGhtPUFXUzQtSE1BQy1TSEEyNTYmWC1BbXotQ3JlZGVudGlhbD1BS0lBVkNPRFlMU0E1M1BRSzRaQSUyRjIwMjUwNzI1JTJGdXMtZWFzdC0xJTJGczMlMkZhd3M0X3JlcXVlc3QmWC1BbXotRGF0ZT0yMDI1MDcyNVQxMDE5NDNaJlgtQW16LUV4cGlyZXM9MzAwJlgtQW16LVNpZ25hdHVyZT04ZThhZWVjMjNlYWExOWI2YzZiMGNlMjE4ZGIyZWNhNzU0OTFjNGI4MmQxMGZhNDdhOGQ5YTEwZTUwZjY5NTJjJlgtQW16LVNpZ25lZEhlYWRlcnM9aG9zdCJ9.HsIPrB0OwFpf0GiWTBVs43R4LNYN2qUWFUPS29UAlsw) [](https://private-user-images.githubusercontent.com/125172250/470685152-e6479ec3-e90f-4978-bc23-d9c26903ff8b.png?jwt=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpc3MiOiJnaXRodWIuY29tIiwiYXVkIjoicmF3LmdpdGh1YnVzZXJjb250ZW50LmNvbSIsImtleSI6ImtleTUiLCJleHAiOjE3NTM0MzkwODMsIm5iZiI6MTc1MzQzODc4MywicGF0aCI6Ii8xMjUxNzIyNTAvNDcwNjg1MTUyLWU2NDc5ZWMzLWU5MGYtNDk3OC1iYzIzLWQ5YzI2OTAzZmY4Yi5wbmc_WC1BbXotQWxnb3JpdGhtPUFXUzQtSE1BQy1TSEEyNTYmWC1BbXotQ3JlZGVudGlhbD1BS0lBVkNPRFlMU0E1M1BRSzRaQSUyRjIwMjUwNzI1JTJGdXMtZWFzdC0xJTJGczMlMkZhd3M0X3JlcXVlc3QmWC1BbXotRGF0ZT0yMDI1MDcyNVQxMDE5NDNaJlgtQW16LUV4cGlyZXM9MzAwJlgtQW16LVNpZ25hdHVyZT0yYTYwNTRmN2YzNjQ2OTgxYjI3ZjFkY2ZlZWJlYjM4Y2MzZDQ3MmY5ZWY4OTdmNWExNmJhY2Q1ZjM5YzcyODNiJlgtQW16LVNpZ25lZEhlYWRlcnM9aG9zdCJ9.aCefjY2xXCoDZP6INYcsU8GEgzNnfu331GnYKwlw3qw)

**📊 Sample Video Analysis**

[](https://private-user-images.githubusercontent.com/125172250/470686285-6eef4f8c-2f66-4a04-b630-24239aebf1e0.png?jwt=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpc3MiOiJnaXRodWIuY29tIiwiYXVkIjoicmF3LmdpdGh1YnVzZXJjb250ZW50LmNvbSIsImtleSI6ImtleTUiLCJleHAiOjE3NTM0MzkwODMsIm5iZiI6MTc1MzQzODc4MywicGF0aCI6Ii8xMjUxNzIyNTAvNDcwNjg2Mjg1LTZlZWY0ZjhjLTJmNjYtNGEwNC1iNjMwLTI0MjM5YWViZjFlMC5wbmc_WC1BbXotQWxnb3JpdGhtPUFXUzQtSE1BQy1TSEEyNTYmWC1BbXotQ3JlZGVudGlhbD1BS0lBVkNPRFlMU0E1M1BRSzRaQSUyRjIwMjUwNzI1JTJGdXMtZWFzdC0xJTJGczMlMkZhd3M0X3JlcXVlc3QmWC1BbXotRGF0ZT0yMDI1MDcyNVQxMDE5NDNaJlgtQW16LUV4cGlyZXM9MzAwJlgtQW16LVNpZ25hdHVyZT1iODNiMmJlYzQ1OTJhZmY0ZDg4YzVlMjExNWZlMTc1MGE0MGMxMWVkNWFkMTZkNzQ2ZTEwNThmYTI0MmUzOTE2JlgtQW16LVNpZ25lZEhlYWRlcnM9aG9zdCJ9.5GUzeOxLnC-QbNB_3UV4PRhrVt8RmIIJl27GHTR2WMs)

**🎞️ Changing Test Cases**

There are a total of 10 sample videos available for testing, organized into the following structure:

RoadAccidentDetection/

├── TC1

│ ├── video1.mp4

│ ├── video2.mp4

│ ├── video3.mp4

├── TC1\_output

│ ├── video1\_output.mp4

│ ├── video2\_output.mp4

│ ├── video3\_output.mp4

├── TC2

│ ├── video1.mp4

│ ├── video2.mp4

├── TC2\_output

│ ├── video1\_output.mp4

│ ├── video2\_output.mp4

├── TC3

│ ├── video1.mp4

│ ├── video2.mp4

├── TC3\_output

│ ├── video1\_output.mp4

│ ├── video2\_output.mp4

├── TC4

│ ├── video1.mp4

│ ├── video2.mp4

├── TC4\_output

│ ├── video1\_output.mp4

│ ├── video2\_output.mp4

├── TC5

│ ├── video1.mp4

│ ├── video2.mp4

├── TC5\_output

│ ├── video1\_output.mp4

│ ├── video2\_output.mp4

**⚠️ Warning: The test videos contain scenes of car crashes that may be distressing to some viewers.**

**📄 Notes:**

For demonstration purposes, all test videos have already been analysed once. Their outputs are saved in the corresponding output folders.  
To analyse a different video, simply modify the input and output paths in the script.