

Code Structure:

The project is organized into three main Python scripts:

tracker.py:

Defines the Tracker class responsible for assigning IDs to tracked objects and updating their positions.

speed.py:

Implements the vehicle speed and counting logic using YOLO for object detection and the Tracker for object tracking. This script includes the main functionality of the project, including counting lines and speed calculation.

main.py:

A simplified version of the speed.py script designed for a different YOLO model (yolov8s.pt). It captures video frames, performs object detection, and displays the video feed with tracked vehicles, IDs, and counting lines.

Dependencies:

- OpenCV
- Pandas
- Ultralytics YOLO (You need to have the YOLO model weights file for object detection)

Usage:

- Ensure that all dependencies are installed.
- Run the script (main.py) to start the video feed.
- Press 'Esc' to exit the program.

Future Improvements:

Real-time Database Integration:

Store tracking and speed data in real-time for further analysis or reporting.

Improved GUI:

Enhance the user interface for better visualization and user experience.

YOLO Model Fine-Tuning:

Fine-tune the YOLO model on a dataset specific to the project requirements for improved object detection accuracy.

Parallel Processing:

Implement parallel processing to enhance the speed of object detection and tracking on high-resolution video feeds.