Traffic Signal Violation Detection System using Computer Vision

This system uses YOLOv3 and tkinter to detect traffic signal violation. The system uses computer vision, GUI with python library Tkinter and basic opencv. The main idea of the project is to detect and track the traffic signal violators.

The System consists of two main components vehicle detection model and graphical user interface (GUI). When the video footage is selected, the moving objects are detected from the input footage using YOLOv3 object detection model to classify vehicles into respective classes. OpenCV and machine learning software library which is used in this project for image processing purpose. It improved the accuracy with many tricks and is more capable of detecting objects. Tracking the activity of vehicles, system determines if there is any violation or not.

The GUI makes the system interactive for the user to use. User can monitor the traffic footage and get the alert of violation with the detected bounding box of vehicle. (python awesome, n.d.)

A traffic line is drawn over the road in the preview of the given video footage by the user. The line specifies that the traffic light is red. Violation happens if any vehicle crosses the traffic line in red state. The detected objects have a green bounding box. If any vehicle passes the traffic light in red state, violation happens. After detecting violation, the bounding box around the vehicle becomes red.

This system can only detect the signal violation using computer vision. It uses opencv on python and machine learning to detect the object, classify and detect the violation but does not issue the fine or detect speeding vehicles.

