Project – Car Tracking

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Step 1: XML Generation and Detection

- Generate XML file with given data. The GTI_Middle close folder was chosen to generate XML with varying parameters for the trainCascadeOperator function. The best results were obtained with a Hog feature detector having 4 stages of cascade training with a false alarm rate of 0.03 and Negative samples factor of 1. The negative samples were taken from the non-vehicles folder.
- The XML was then used to detect the cars in the 1st frame and the following cars were detected.
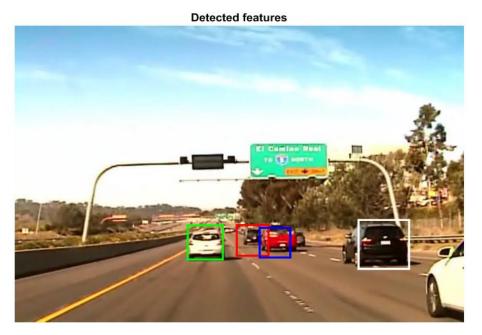

Step 2 : KLT Tracking

- The next step is to track the respective cars for a certain number of frames. The PointTracker function from the CV toolbox was used for this where certain points are chosen (using detectminEigenFeatures) as features which are then matched with the successive frame. The successfully tracked features are shown in the image below

- The false boxes which were present due to false detection from the XML file and which were falsely tracked across frames were eliminated by adding a region of interest and bounding boxes trackers. Additionally an area filter was also added to remove a few false detections.

- The detections are refreshed every 8th frame to prevent the tracked points to stop drifting away as the frames progressed. The bounding box

Detected features

dimensions are also modified with the new detection to enable a tighter tracking.
- The different cars are then marked with their own box colors and are tracked throughout the video

REFERENCES:

1. https://www.mathworks.com/help/vision/examples/face-detection-and-tracking-using-the-klt-algorithm.html