A framework of vehicle detection using HOG + SVM ...

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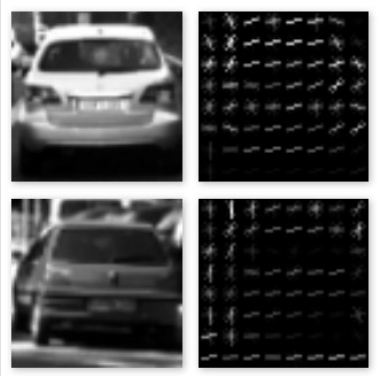
Pipeline

Extract features(Hog, color histogram)

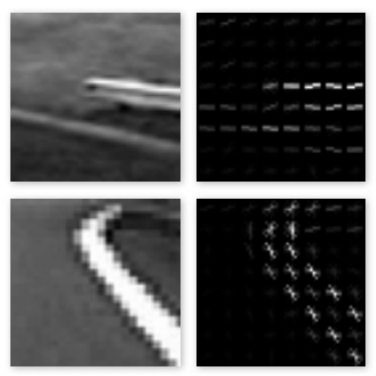
Choose sliding window

Train the classifier(SVM)

Optimize result



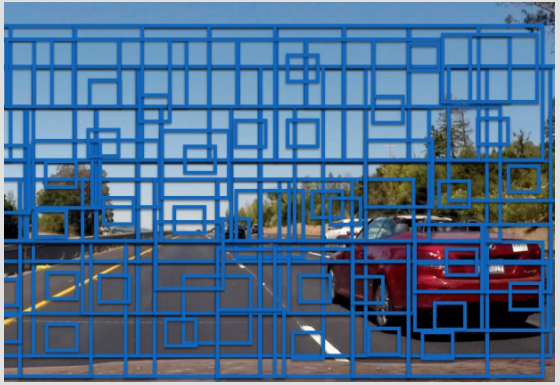
HOG feature of vehicle



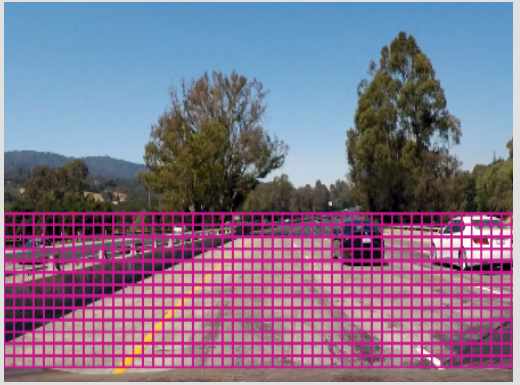
HOG feature of non-vehicle

Feature Selection

1. Shape(Histogram of Oriented Gradients)
2. Color(Histogram)



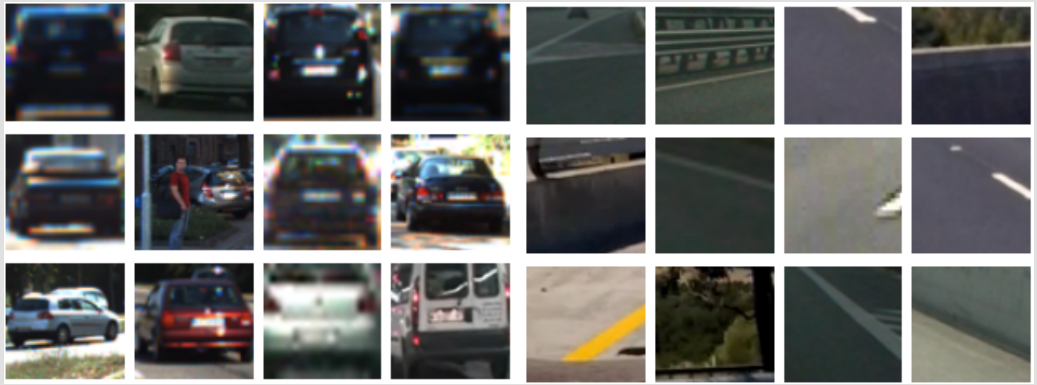
Sliding window



Our detection area

How to choose sliding window?

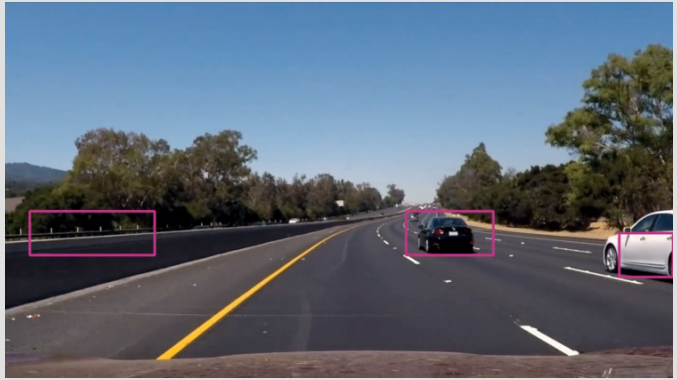
1. Speed
2. Accuracy



Vehicle and non-vehicle samples. Source: GTI vehicle image database

Classifier: linear SVM

Accuracy: 97%



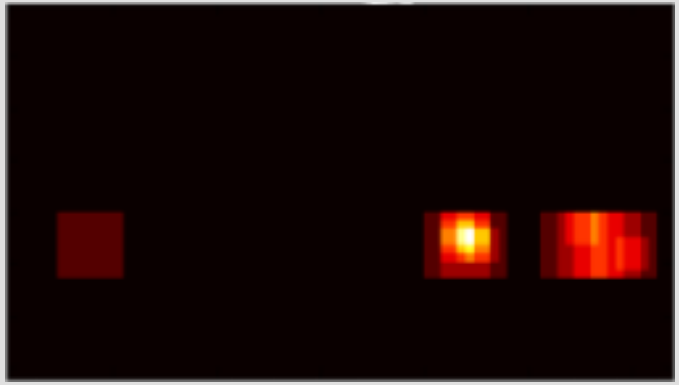
False positives

Multiple detectors

Two problems:

1. False positives
2. Multiple detectors

Multiple detectors



Heat map

Heat map

1. Add heat to pixels in the window
2. Impose a threshold

Experimental Result and Summary