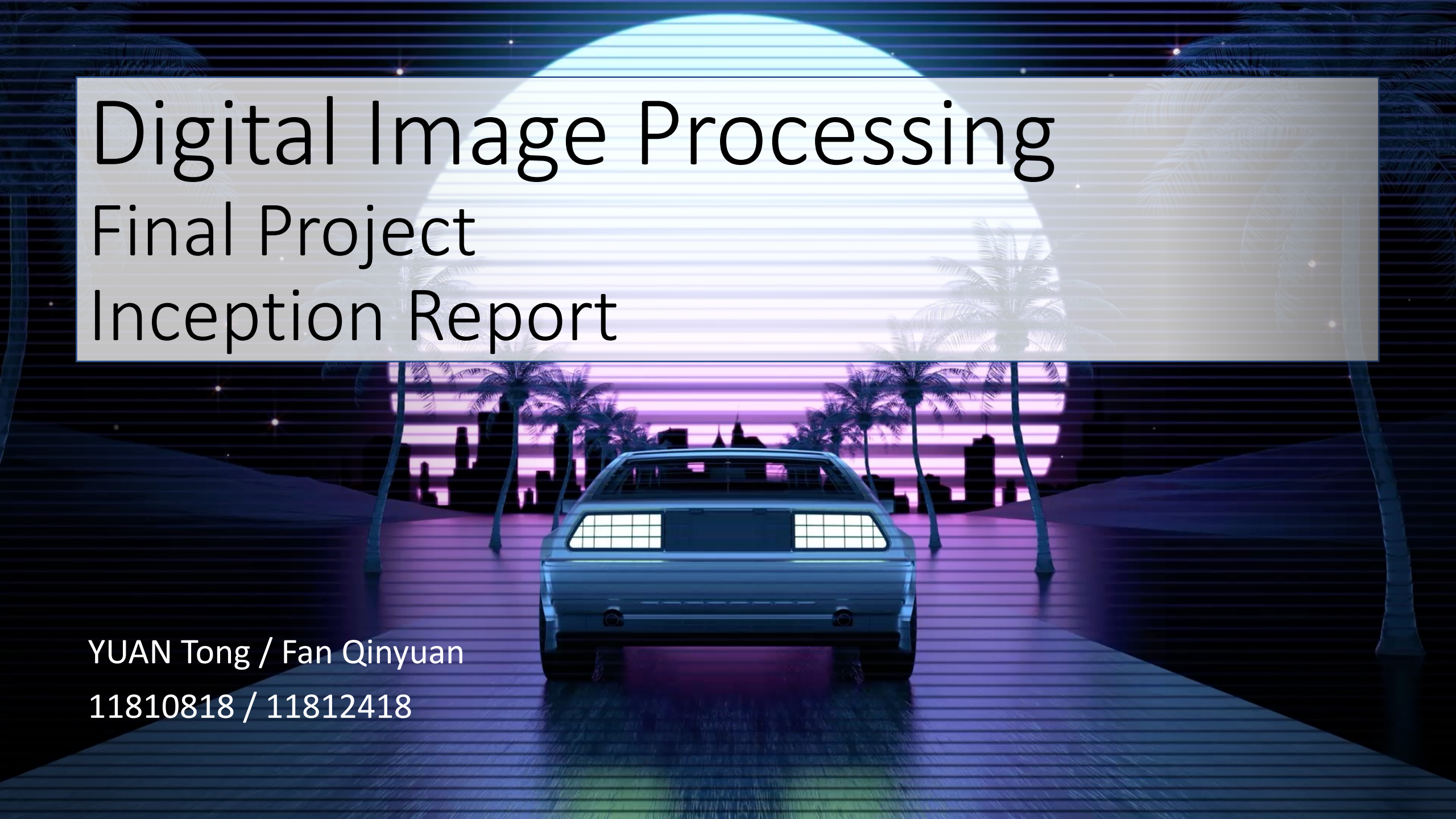


Digital Image Processing
Final Project
Inception Report

YUAN Tong / Fan Qinyuan

11810818 / 11812418

Background

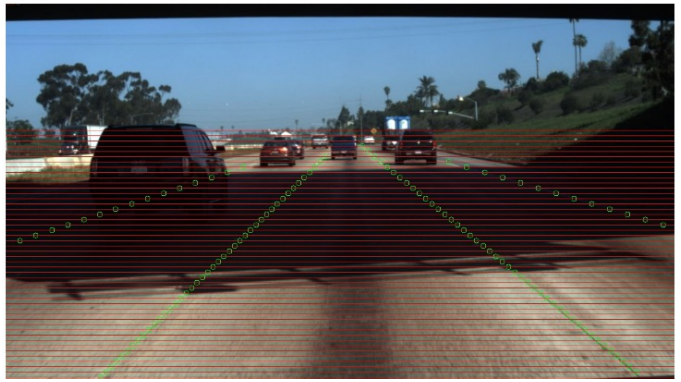
Self-driving car

Background

Computer vision: low cost, low rubust

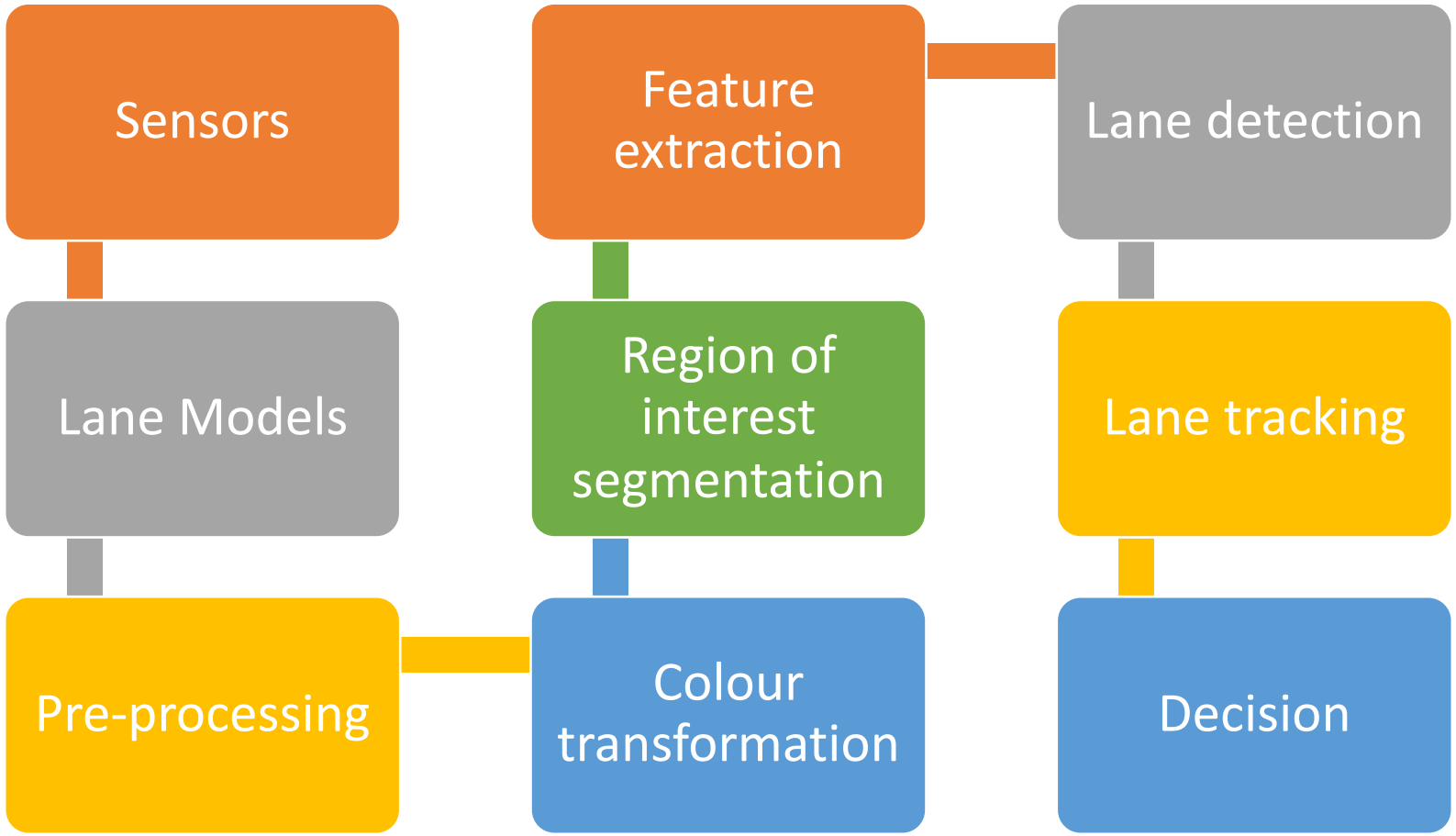
Laser radar: high rubust, extremely high cost, only support obstacles

High precision map: Only use as assistance



The car must be able to recognize road lanes

Background


Sensors
Feature extraction
Lane detection
Lane Models
Region of interest segmentation
Lane tracking
Pre-processing
Colour transformation
Decision

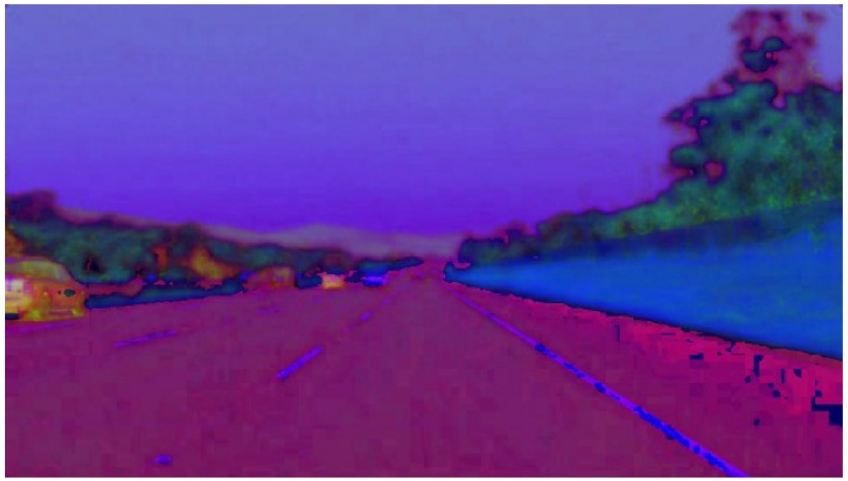
Traditional Method

Original Image

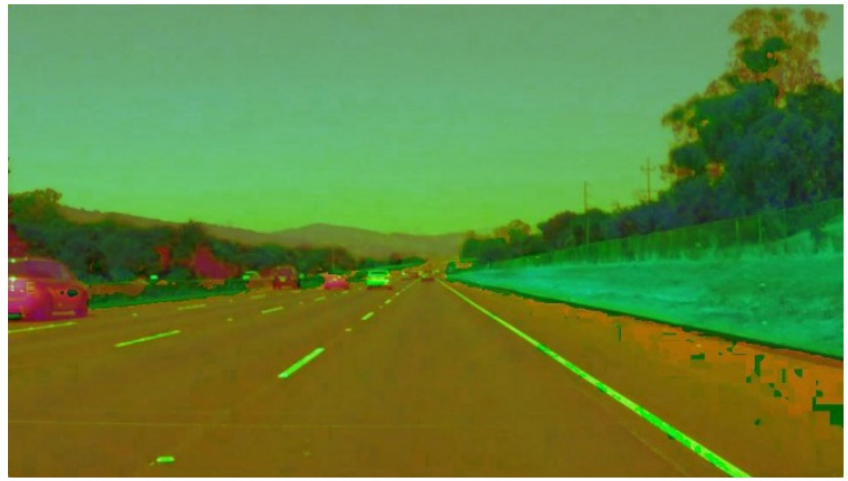
Gray Scale

Darken the gray scale image

Original Image



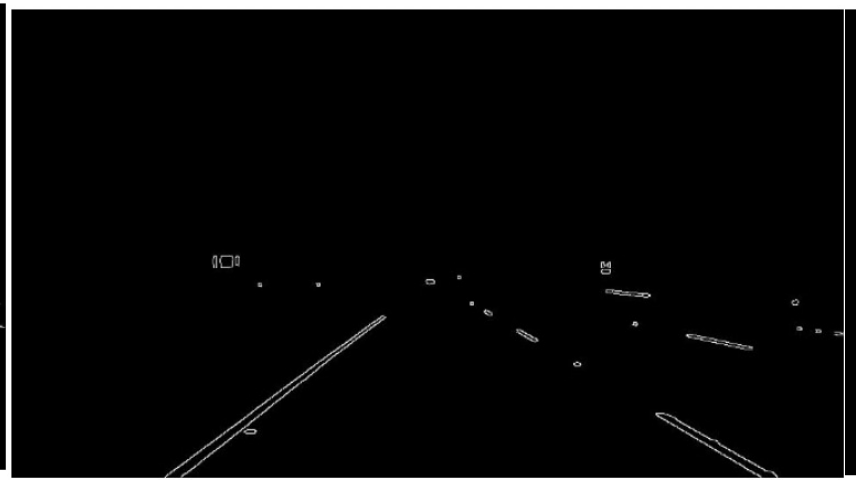
HSV



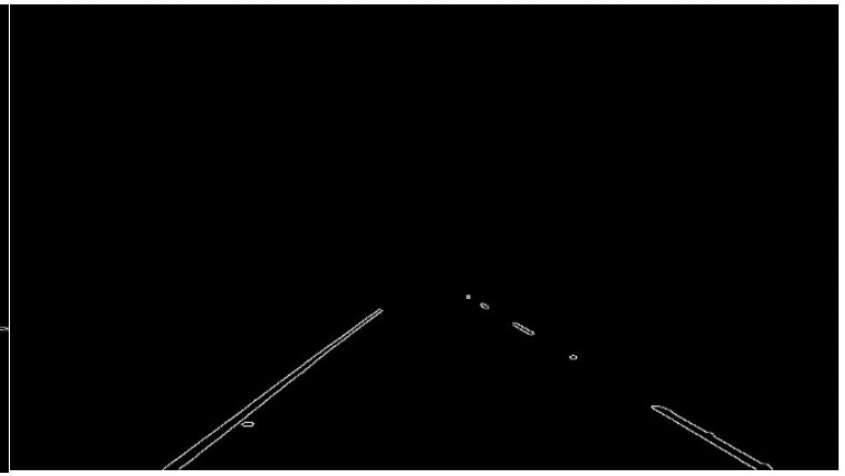
HLS

Traditional Method

Color selection

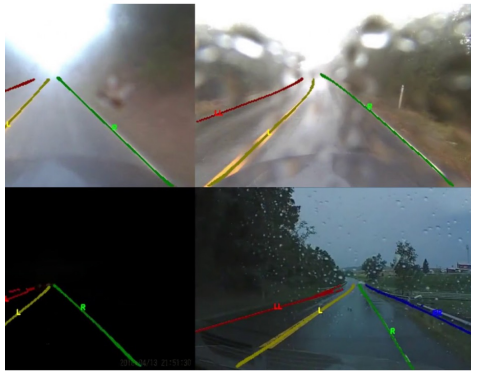


Edge detection



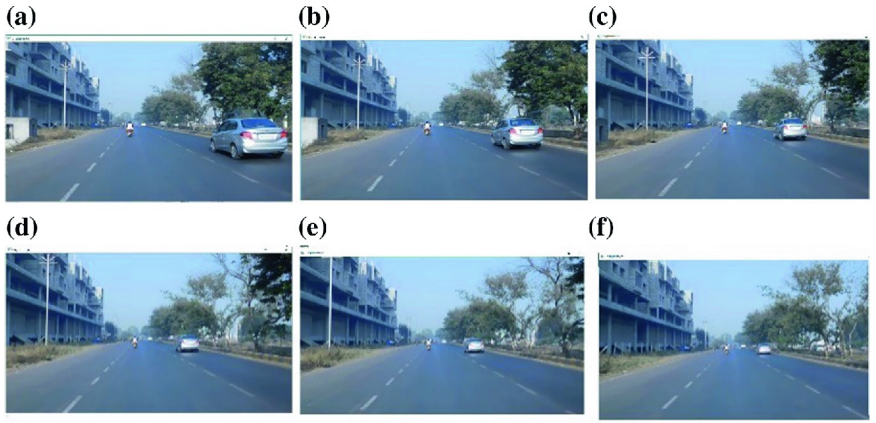
Region Selection

Challenge



Our Plan

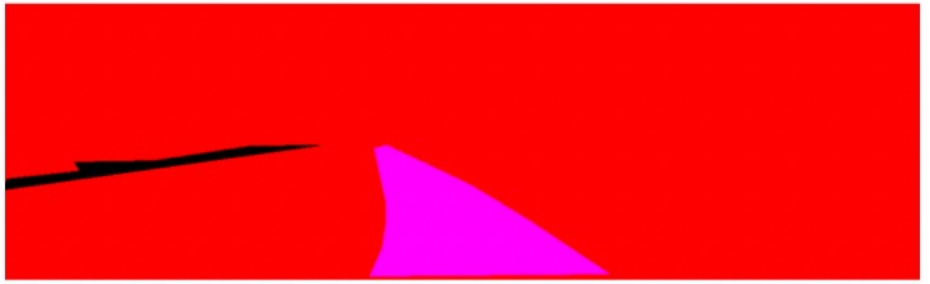
More precise preprocessing
classify
analysis



Video based detection
Link

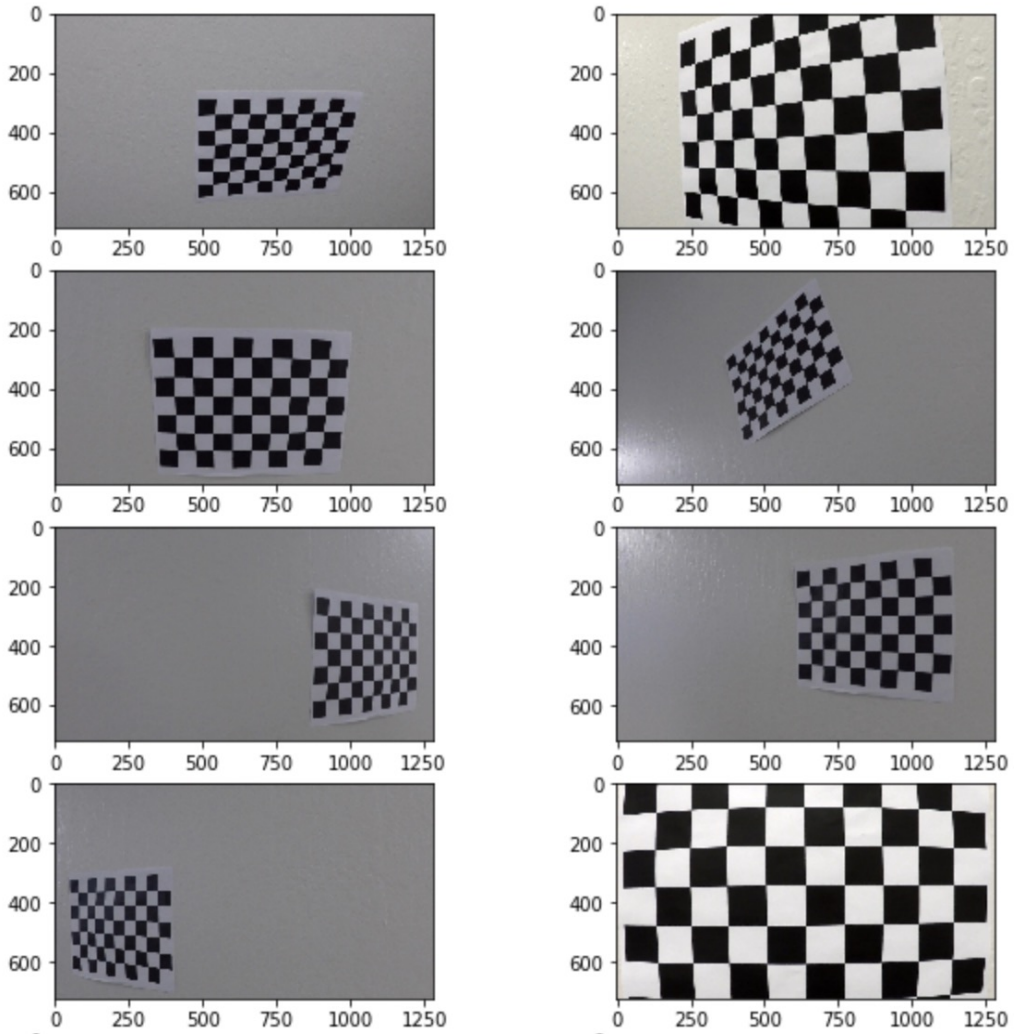
More complex road
Smart analysis

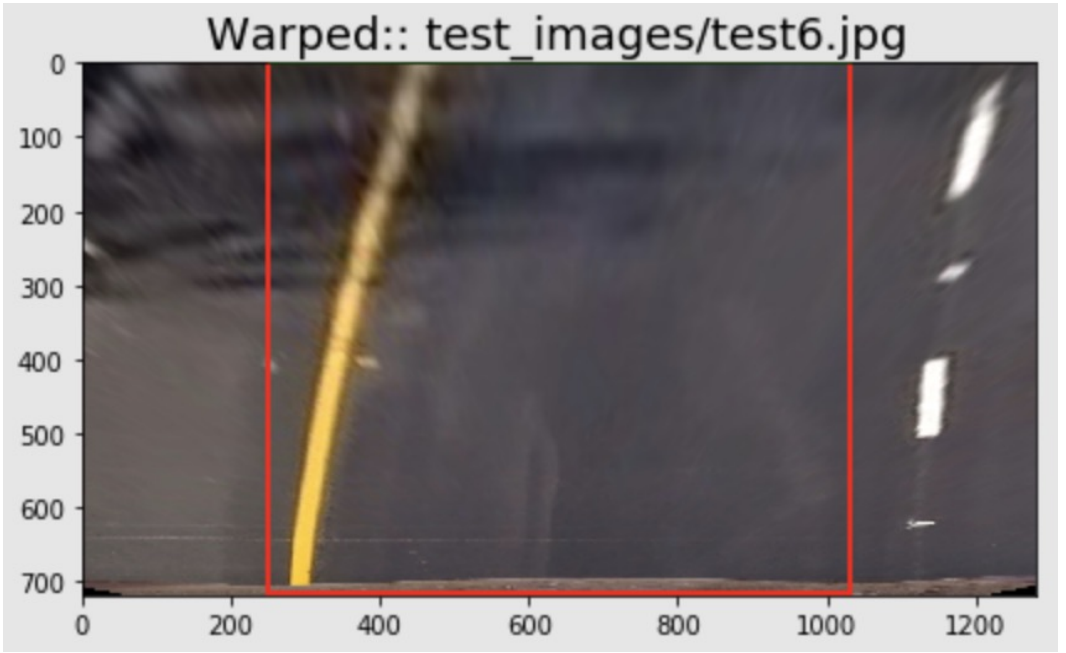
(a) Training dataset of KITTI Vision Benchmark Suite



(b) Testing dataset of KITTI Vision Benchmark Suite

Remove Distortion





Distribution of Tasks

5.1 Qingyuan Fan

Write the filter with conventional methods, pre-precessing the image

5.2 Tong Yuan

Profiling and improve the filter by using techniques like markov model on adjacent frame, extract the road lane from image.