# 車道偏移警示應用系統

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Abstract: This study uses camera installed on the vehicles to record driving image. During driving, if the vehicle departures away from the original lane unexpectedly which caused by abnormal driving such as driver's excessive tiredness, distraction etc., this system will warn driver to correct the lane and then reduce the possibility of car accident.

Keywords: Lane Departure Warning System; Driving Safety Support System; Hough Transform; Kalman Filter.

Ⅰ Introduction

The invention of vehicles have been hundreds of years. The development of vehicle technology is also changing swiftly. According to National Highway Traffic Safety Administration statistics shows that the accident caused by inadvertently shifted lanes account for 41% of all accident rate. To analyze these reasons, those are mainly caused by dozing, dialing the phone, pick items while driving, sudden changes in road conditions. Statistics show that if we can advance 0.1 seconds to correct abnormal driving, we can reduce 90% of driving accidents. Therefore, we can see the importance of lane.

Ⅱ System Architecture and Flow chart
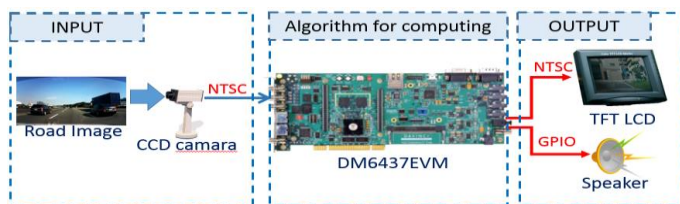
Hardware architecture of the system as shown, the camera captures road in front of the image. The image will be transmitted to the TI-DM6437 digital signal processor which is installed in the car for image processing.
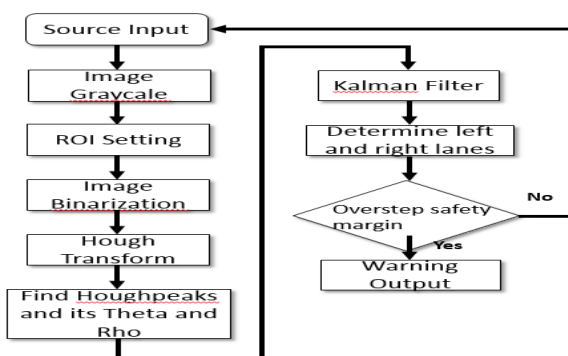
Ⅲ Experiment Details

Each sequence of input images are proceeded by detecting the edge point processing, filtering the noise of edge points. Next, calculate the corresponding lines from the edge points in the images through Hough Transform. Then follow the geometric properties of the lines to proceed filtering, eliminating none-lane objects such as buildings, billboard etc. In the end, integrate the detected lanes of multiple locations in continuous images to output a stable lane detection results.

Ⅳ Experiment Results

The figure shows marking lines after implementing lane detection and uses the variation of offset below to determine whether the vehicle departures.

Ⅴ Conclusion

Implement image processing on DM6437 platform is the popular topic nowadays. How to save effort and lead to better results is the common goal of many scholars. In this experiment, we blend into Simulink attached in Matlab to implement lane departure warning system. Furthermore, we used Kalman Filter to promote the accuracy of lame tracking, and then apply in the daily life.

Reference

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