ECE-415 FINAL PROJECT

LANE DETECTION USING EDGE DETECTION

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ABSTRACT

In recent years, an unceasing stream of lane detecting algorithms has arisen, however the benefits and drawbacks of a full comparison of diverse algorithms have resulted in the following issues: To begin with, the robustness of lane line detection is weak, owing to the road's surrounding environment. Second, the real-time nature of the lane line detection is poor, affected by other marking lines on the driveway, or damaged in the lane; third, the impact is greater in traffic-intensive city streets, affected by natural factors such as trees or building shadows around the driveway; and fourth, the impact is greater in traffic-intensive city streets, affected by natural factors such as trees or building shadows around the driveway; and fifth, the impact is greater in traffic-intensive city streets, affected by natural factors such as trees or building shadow When pollution is severe, the system's image of the lane line is fragmentary and of low quality, making it more difficult to analyze and interpret data from the detecting system.

INTRODUCTION

The continued popularity of automobiles and the increase of people's living conditions, practically every family now possesses one or more automobiles, allowing them to travel in luxury and convenience. Despite the fact that we are now in the twenty-first century, the post-modern transportation system has advanced significantly, it is still not proportional to the growing traffic environment requirement of people. Environmental pollution, energy shortages, traffic jams, and traffic safety difficulties have all been brought on by the rapid development of the automotive industry, with traffic safety issues being particularly acute and problematic, and having grown into a major global problem.

The present modern automotive safety technology primarily uses computer, automatic control, and data fusion methods to improve the driver's

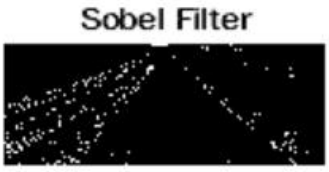
driving safety factor, hence making the car more intelligent in the driving process. As a result, intelligent transportation system research began to take shape. When the driver operates inappropriately based on the intelligent observation of the vehicle's driving environment, the system will immediately alert the driver by voice and other forms to remedy the current erroneous driving operation. In specific conditions, such as the driver's sleep or low mental state, the system will immediately take over operation of the car, preventing traffic accidents.

METHOD DESCRIPTION

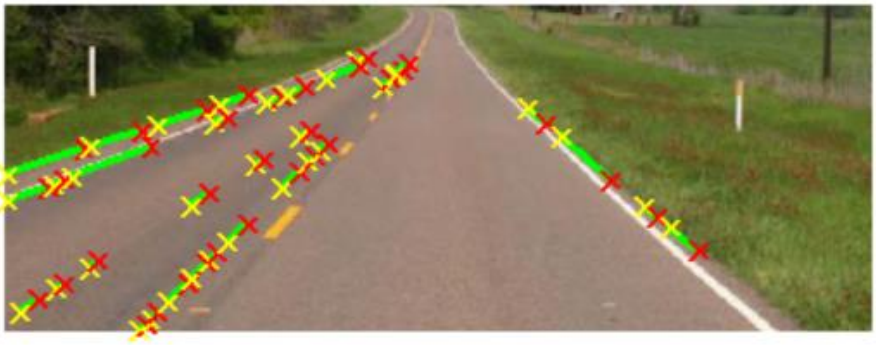
After researching a lot of methods like Canny, Sobel, Kirsch etc., I found Sobel to be accurate and less complicated to implement. At first, we take the image as input and remove any noise by applying rgb2gray function, this process is called pretreatment. After this step we apply black and white filter and come to a image of your liking by incrementing or decrementing the level values. After this we apply Sober filter which will give us the outlines of the lane. Now to extract and mark the information we need we use Hough line transform to extract the lines on to the original image

EXPERIMENTAL RESULTS

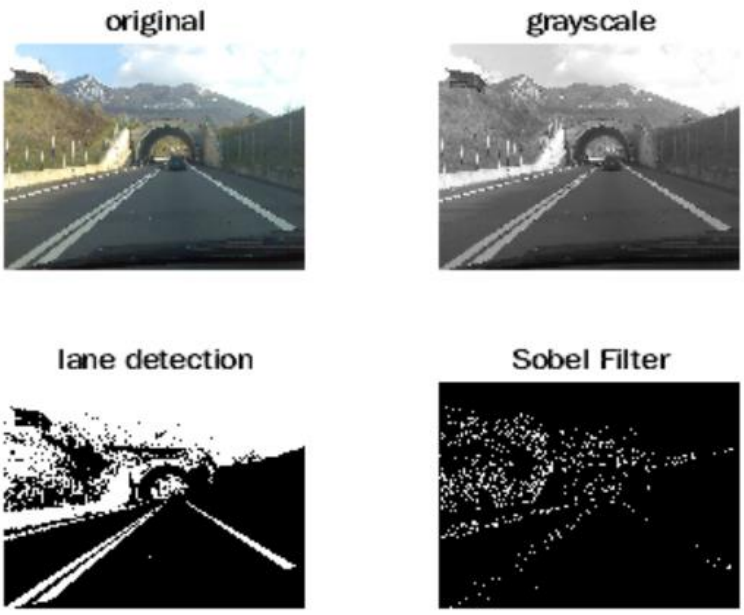
1.



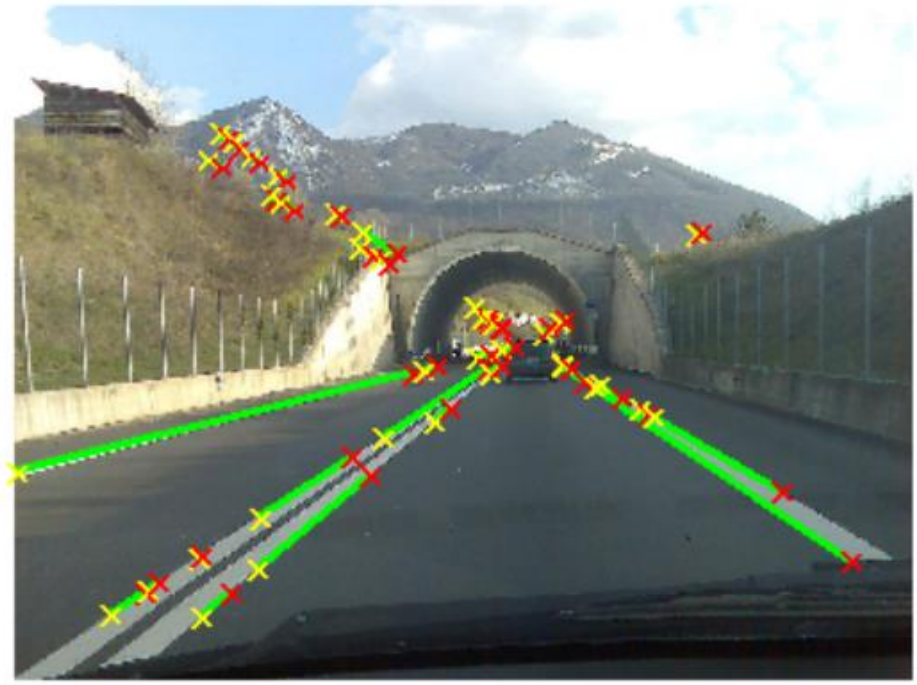
RESULT



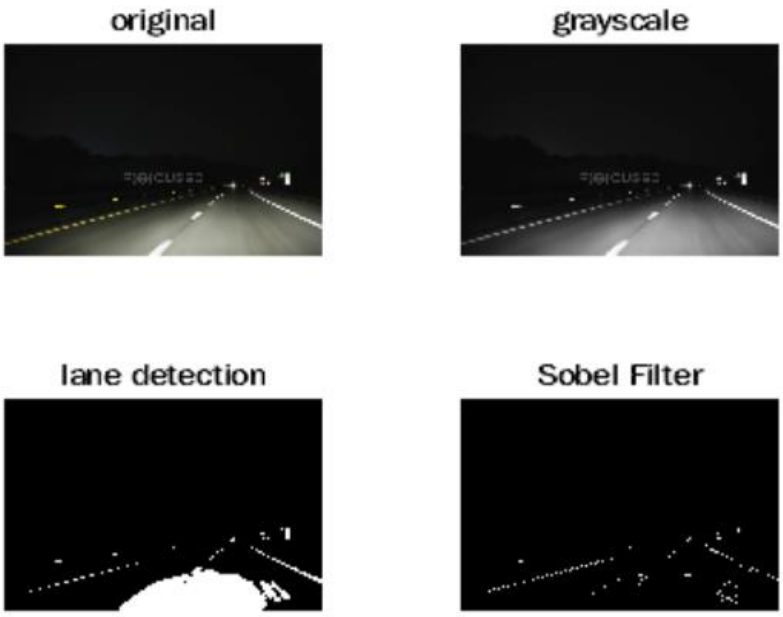
2.



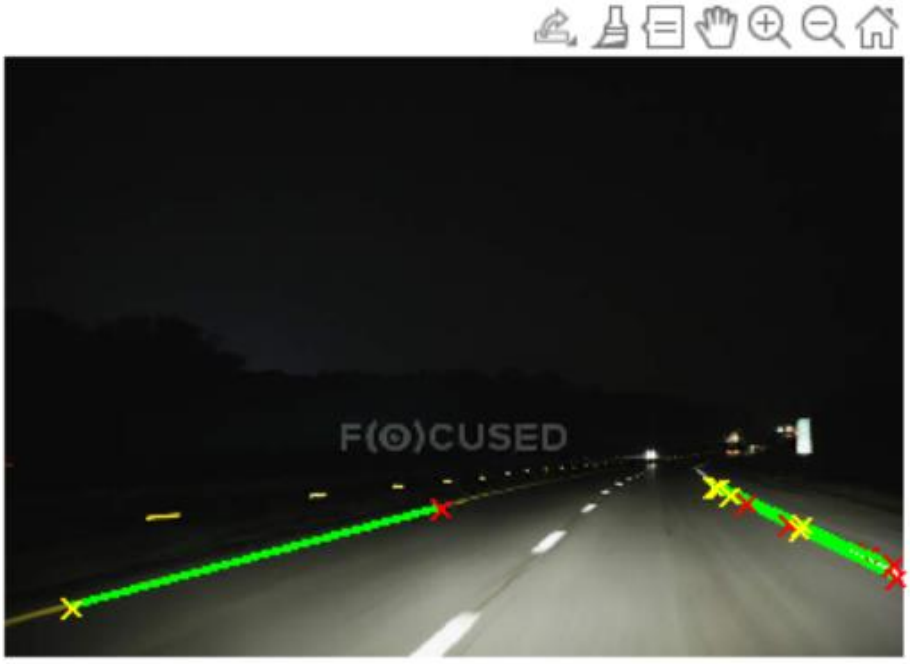
RESULT



3. Night



RESULT



CONCLUSION

The advancement of intelligent transportation has aided lane line detection research and development. There are numerous challenges and flaws in the intelligent development process. This essay is based on these issues and flaws, and it examines the line's reasons and discovers the lane line's edge. The fundamental questions were thoroughly investigated. The robustness and adaptability of the detection results are improved by the improved Hough transform and Kirsch operator, the redundant information of the operator is reduced by the matrix operation, the computational complexity of the algorithm is reduced by the matrix operation, and the detection of lane lines is improved. Real-time speed has been improved. The Internet of Things era will undoubtedly encourage the development of smart automobiles, resulting in new breakthroughs and advances. We anticipate smart automobiles arriving in regular people's homes as soon as possible, providing ease, safety, and comfort to our daily lives**.**

CONTRIBUTION

100% of the project was done by me. I had to run and implement various topics in the code and testing and running the code took a while but, in the end,, it turned out to be good.

REFERENCES

- Week 11 lecture in the blackboard came to help, going to the lecture notes and videos in Edge Detection and Otsu's thresholding gave a clear overview on how to come about the project.
- Also, I researched about different filter regarding image detection in matlab.com.