

General Guidelines for Presentation

- Slides should not be too heavy with content. Better to create point wise.
- If you require more than one slide for any point, right click on that point slide then select duplicate slide and modify the duplicated slide.
- Diagrams must be aligned at centre and clearly visible with caption.
- All the mentioned fonts, font size, title content, etc should not change and strictly as per the given format and guidelines.



Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE
(All Programs Accredited by NBA)

Department of Information Technology



Road Lane Line Detection

Group No:

Dhrru Ahuja 18104048

Prerana Kanawade 18104053

Shubham Sakpal 18104071

Guided by

Prof. Yaminee Patil

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1. Introduction

As there is an inscrease in tranportation the Lane Line detection can be used as one of the critical component for vehicles. The objective of this project is to build a machine learning project to detect lane lines in real-time.

- Problem Identified :
 - Increase in numbers of accidents including vehicles due to rash and undisciplined drivers
- Solution Proposed :
 - The concept is to describe the path for self-driving cars and to avoid the risk of getting in another lane.

2. Literature Review

Sr. No	Authors	Paper Tittle	Methodologies	Findings
1	Suvarna Shirke and C. Rajabhushanam	A study of lane Detection techniques and lane departure system	-	This paper gave a brief comparisons of other lane detection techniques. It helped to understand the approach of lane detection and lane departure.
2	Mehdi Feniche and Tomader Marzi	Lane Detection and Tracking For Intelligent Vehicles: A survey	Image Cleaning, Features Detection, Tracking Integration, Model Application and Coordinates Translation.	This literature briefed about the aspects that allows the vehicle sensing its environment like road perception modules as road edges, traffic lane, etc
3	Xianwen Wei, Zongjun Chai, Zhaojin Zhang and Wei Feng	Research on lane Detection and Tracking Algorithm Based on Improved Hough Transform	Image Pre-processing, Extraction Lane Line, Lane line detection based on Hough	Basic operations for automatic cruise driving, lane keeping and vehicle overtaking. The safety of vehicle is also explained in it.

2. Literature Review

Sr. No	Authors	Paper Tittle	Methodologies	Findings
4	Bubly Barua, Shuva Biswas and Kaushik Dev	An Efficient Method of Lane Detection and Tracking for Highway Safety	Capturing image, Camera Calibration, RGB to Grayscale conversion, Noise removal, Edge Detection, Hough Transform, Region of interest and curve fitting	The thesis paper solved a few doubts and discrepancies regarding the lane detection with taking the affects of environment in account.
5	Abdulhaka m.AM. Assidiq, Othman O. Khalifa, Md. Rafiqul Islam and Sheroz Khan	Real time lane detection for autonomous vehicles	Image Capturing, Conversion to Gray scale, Noise reduction, Edge Detection, Line Detection, Line boundary Scan and Hyperbola fitting.	Forming a series of different frames for the image segmentation and removal of shadows. Use of Hough Transformation with restricted search area.

3. Objectives

1. To detect the line and determine the approximate position and shape of the lane.
2. To prevent collisions and generates an alarming conditions.
3. To detect lane markings on the road by giving the video of the road as an input to the system.
4. To prevent the occurrence of accidents due to error in lane judgement.

4. Scope

1. Seeing the future development in the infrastructure of the world, Road lane line detection could be adapted in cars in order to provide better lane judgement.
2. Improved accuracy and consistency in machine learning and real-time systems it can help overcome some current problems faced in Road lane line detection.
3. Lane and road understanding as unsupervised data in large quantities of supervised data can be gathered with some effort by driving with additional sensors.

5. Technology Stack

Hardware

- 1.Processor type: Intel Pentium 3/ Pentium 4
- 2.Processor speed: 2.1Ghz or more
- 3.Hardware: 5GB
- 4.Memory: 1GB RAM

5. Technological Stack

Software

1. Operating System: Windows XP/2000/Vista or Linux
2. Language use: Python
3. Tools and Libraries: OpenCV

5.1.Algortithm

1.Hough Transformation: The Hough transform is a feature extraction technique used in image analysis, computer vision, and digital image processing. The purpose of the technique is to find imperfect instances of objects within a certain class of shapes. The classical Hough transform was concerned with the identification of lines in the image.

2.Frame Masking: 'masking' refers to the practice of using a mask to protect a specific area of an image. Masking an area of an image protects that area from being altered by changes made to the rest of the image. This area is usually the area that is required in the software/ process.

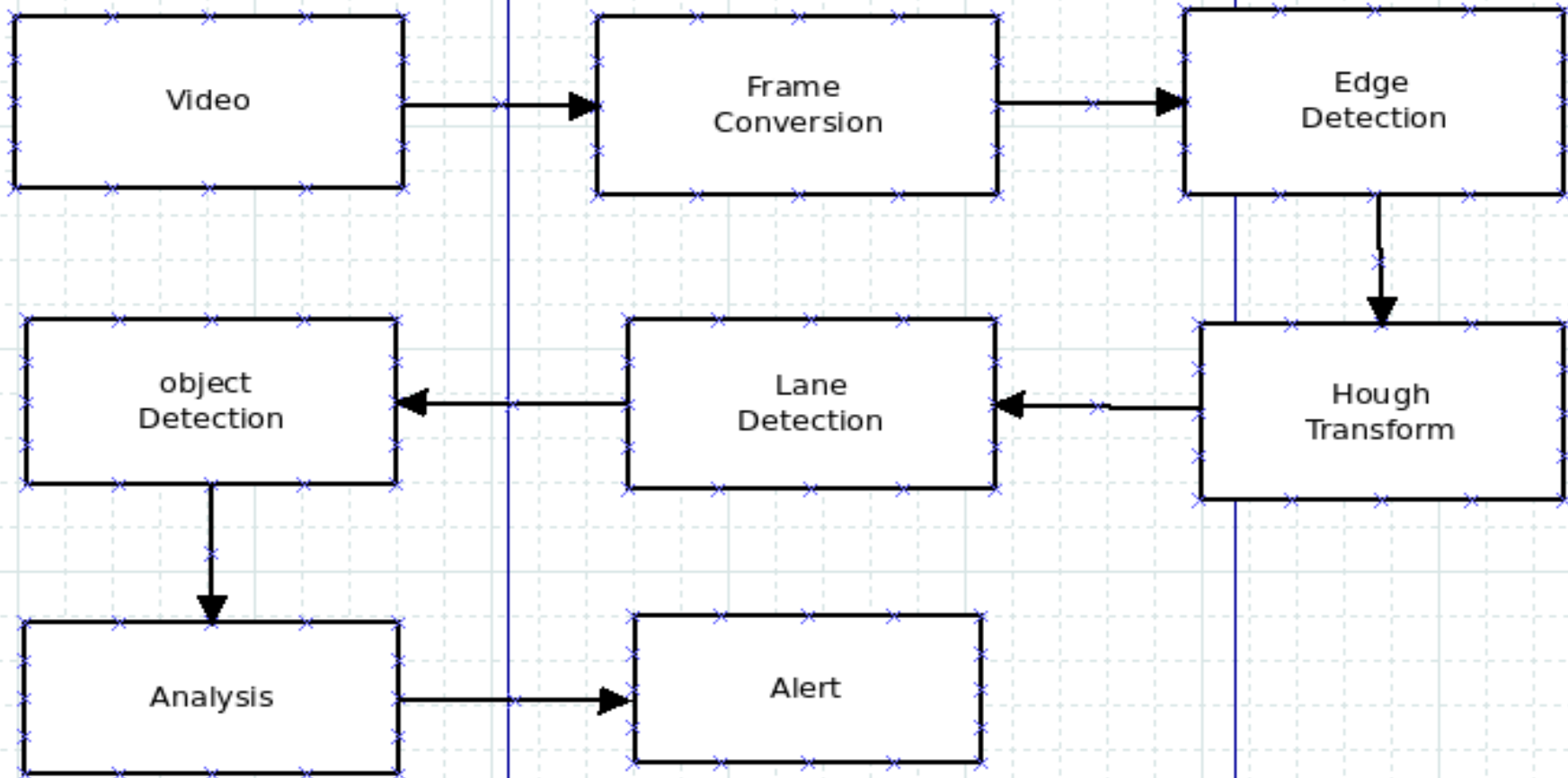
3.Conversion to Gray Scale: The road surface can be made up of many different colors due to shadows, different pavement styles, or age, which causes the color of the road surface and lane markings to change from one image region to another. Therefore, color images are converted into gray scale.

4.Noise Removal: Noise removal is a prerequisite step for edge detection and thus smoothens the image. When detecting edges it is important to accurately catch as many edges in the image as possible. Image noise must be filtered out as it creates false edges and ultimately it affects edge detection.

5.Edge Detection: Edge detection is a very important step in determining the location of lane boundaries as the edge is one of the major information contributors to the lane.

6.The hyperbola pair fitting: this phase uses the two vectors of data points from the lane scan as input. A least-squares technique is used to fit a hyperbola to the data. One hyperbola is fit to each of the vectors of data points; however, they are solved simultaneously since they are a pair model.

6. Block Diagram to propose project Idea



7.Conference

International Conference On Big Data, Machine Learning and Applications

Paper Submission Deadline: September 25, 2021

More Details : <http://bigdml.nits.ac.in/>

5th International Conference on Intelligent Sustainable Systems (ICISS 2022)

Paper Submission Deadline: 10 November 2021

More Details : <http://icoiss.com/2022/index.html>

2nd International Conference on Ubiquitous Computing and Intelligent Information Systems

Paper Submission Deadline: 2 November, 2021

More Details : <http://icuis.in/2022/>

References

1. Bubly Barua, Shuva Biswas and Kaushik Deb, "An Efficient Method of Lane Detection and Tracking for Highway Safety", 2019 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT)
2. Xianwen Wei, Zhaojin Zhang, Zongjun Chai and Wei Feng, "Research on Lane Detection and Tracking Algorithm Based on Improved Hough Transform", 2018 IEEE International Conference of Intelligent Robotic and Control Engineering (IRCE)
3. Wael Farag and Zakaria Saleh, "Road lane lines Detection in real time for driving assistance systems", 2018 international conference on innovation and intelligence for informatics, computing, and technologies (3ICT)

Thank You...!!