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Survey on Pedestrian Detection and Collision Prevention

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ABSTRACT: These days there is a rise in road accidents and the pattern seems to be regular either due to the drivers' negligence or the pedestrians' negligence. The main purpose of this survey paper is to determine whether these patterns can be learned or processed such as to know beforehand if there is a possibility of some mishap. The system defined in this paper proposes the use of embedded systems to overcome such problems due to human error or negligence. The system proposed will detect obstacle if any and will alert the user. The pedestrians or any other obstacle will be detected by a camera the images captures by the camera will be processed for obstacle detection. If the system finds that the object (pedestrian in our case) is in proximity or may cause collision, then the user or the driver will be alerted for any possible casualty.

KEYWORDS: Raspberry Piobstacle detection, image processing

I. INTRODUCTION

While driving the driver needs to be very attentive and focused on the road while keeping an eye for any obstacle or possible obstacle. Thus driving a vehicle needs a continuous evaluation of the environment and driving accordingly. Pedestrians as an obstacle can be still or in motion and thus can be much harder task to predict.
The purpose of this study is to mitigate the risk by pre-processing the data available by means of monitoring the surrounding thus alerting the user about possible human error.

II. LITERATURE SURVEY

1. Vision-based pedestrian detection: The protector system

This paper introduces the consequences of the main vast scale field tests on vision-based person on foot assurance from a moving vehicle. Our PROTECTOR framework consolidates passer-by location, direction estimation, hazard appraisal and driver cautioning. The paper seeks after a "framework approach" identified with the discovery part. An advancement plot models the framework as a progression of individual modules and finds a decent generally parameter setting by joining singular ROCs utilizing a curved structure procedure. On the test side, we present a technique for the approval of the passer-by recognition execution in a genuine vehicle setting. We trust this test system to contribute towards the foundation of benchmark testing, empowering this application to develop. We approve the PROTECTOR framework utilizing the proposed philosophy and present intriguing quantitative outcomes dependent on a huge number of pictures from long periods of driving. Despite the fact that outcomes are promising, more research is required before such frameworks can be set because of normal vehicle drivers.

2. An adaptive driving assistance system for electric vehicle

In this paper, a versatile driving help framework for electric vehicle (EV) charging controlling was developed. With the end goal to ensure EV driving without coming up short on battery, chargeable driving area was intended to show a sheltered driving district. EV was permitted to achieve any situations inside the proposed chargeable driving locale and was ensured to reach somewhere around one accusing station of adequate battery control. When all is said in done, a

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customary charging controlling framework for the most part evaluated the greatest driving extent to demonstrate a reachable driving locale. However, just considering reachable driving area may result coming up short on battery a while later. It was not ensured that the reachable area was likewise chargeable. In this way, the proposed versatile driving help framework evaluated a chargeable driving area. The chargeable driving locale not just evaluated the required battery control from the present EV position to the limits of the district yet additionally the required battery control from the limits of the area back to an accessible charging station. As such, as long as EV was driven inside the demonstrated chargeable driving district, EV was ensured to reach somewhere around one charging station to charge without coming up short on battery. In the executed framework, current EV position, charging station positions, vehicle weight, street slope and vehicle speed were connected to figure the chargeable driving locale.

3. Collision detection system for vehicles in hilly and dense fog affected area to generate collision alerts

Opportune location of different vehicles in the region is of extraordinary significance to help maintain a strategic distance from mishaps and potential loss of human life, automobile overloads particularly in Hilly territories with barrettes twists and decreased perceivability condition in thick foggy zones. This paper presents a GPS based framework which effectively and persistently sends vehicle area facilitates (scope/longitude) to the eye in the sky server, which forms/investigations information from every single such vehicle and predicts potential crash and sends backs caution to the vehicle to raise visual/sound alarm. We recreate a situation utilizing advanced cells and GPS framework.

4. A real-time visual-based front-mounted vehicle collision warning system

This paper proposes an ongoing impact cautioning framework for the front of a vehicle, which contains three phases: path checking recognition, vehicle location, and vehicle separate estimation. Sobel edge identification and Hough change systems are utilized in the path stamping recognition stage to remove path checking data. In the vehicle identification arrange, two altogether different circumstances are considered: daytime and evening time. In the daytime, two sorts of highlights, vehicle shadows and level edges, are extricated to identify the areas of vehicles. These two highlights can separately be gotten by Otsu's strategy and a flat edge discovery technique. For the evening time or in long periods of poor perceivability, vehicle tail light highlights are utilized to identify the area of vehicles. These highlights can be gotten from the Cr segment of the YCrCb shading model and the tone part of the Hue, Saturation and Intensity (HSI) shading model separately. In the vehicle remove estimation organize, the framework evaluates the separation between the host vehicle and the front vehicles utilizing exponential capacities. Some notice messages will be yield to the drivers if fundamental. In this examination, a recorder is determined to the front windscreen to get the info successions. The test results demonstrate that the proposed technique has incredible strength and ease of use. We expect for the proposed technique to be inserted into driving help frameworks and introduced in vehicles later on.

5.Pedestrian detection andDriver attention

This paper suggests learning pedestrians behaviour and pattern and interpreting for possible danger. The paper suggestsbuilding a system which can learn how humans think about a cue for any casualty. Human behaviour follows a specific pattern in specific conditions. These patterns can be learned and used as a base for predicting probable casualty.

6.Detecting Sudden Pedestrian Crossings and Avoiding Accidents Using Arm 11

The use of image processing can be of great use while detecting pedestrians and avoiding collision. The system suggested has a camera mounted on a vehicle which will monitor the surroundings of the vehicle. The images captured by the camera are then processed by a controller which then decides whether there is a possibility of any collision. The proposed system also uses proper classification algorithm for pedestrian detection and furthermore the system tells the positioning for the same, whether the detected object is to left or right of the vehicle.

7.Vision-based human motion analysis: An overview

Marker less vision-based human movement investigation can possibly give a reasonable, non-prominent answer for the estimation of body presents. The critical research exertion in this space has been roused by the way that numerous application regions, including observation, Human–Computer Interaction and programmed comment, will profit by a

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powerful arrangement. In this paper, we talk about the attributes of human movement examination. We partition the investigation into a demonstrating and an estimation stage. Demonstrating is the developmentof the probability work, estimation is worried about finding the undoubtedly present given the probability surface. We talk about sans model approaches independently. This scientific categorization enables us to feature inclines in the area and to bring up impediments of the current condition of the craftsmanship.

IV.PROPOSED SYSTEM APPROACH

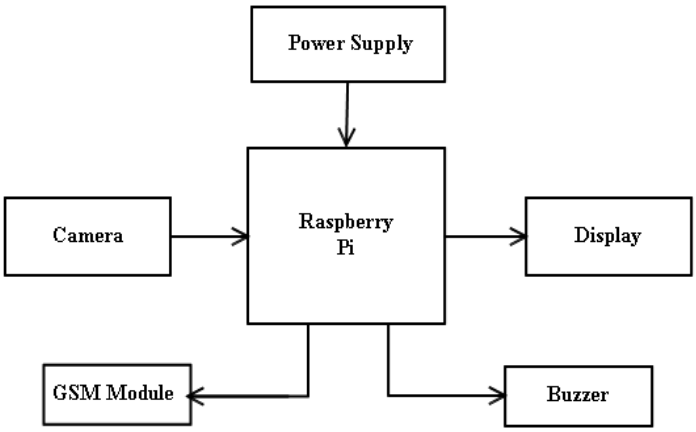

Fig.1 Block Diagram of Proposed System

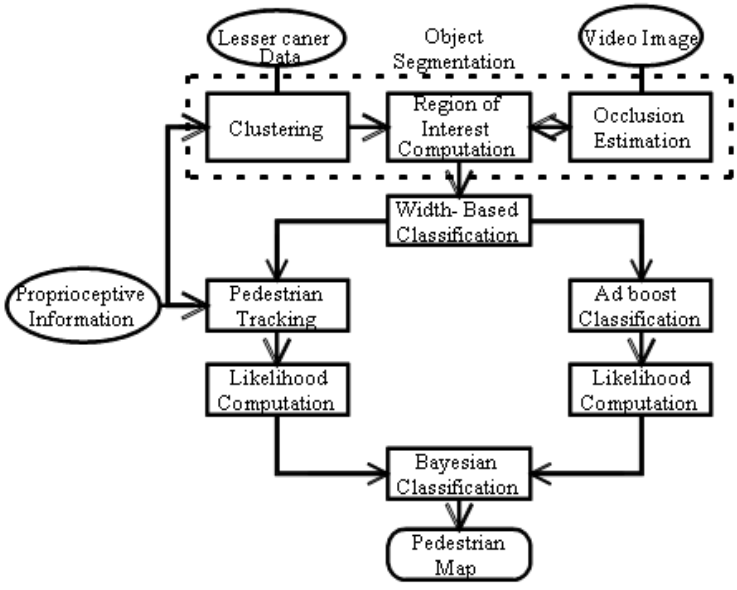

Fig.2Architecture Diagram of Proposed System

The proposed system is developed for detecting pedestrian while a vehicle is in motion. At times the driver may lose focus and may hit a pedestrian or increase the possibility of casualty. This possibility can be minimised by the proposed

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system. The system consists of a mounted camera which monitors the path the vehicle takes. The images from the camera are fed to the controller, which in our case is a raspberry pi, for processing and data cleaning. The system then uses object detection algorithm to detectthe path which the vehicle takes is obstacle free or not. If the system detects an obstacle it will alert the user with a warning buzzer and display it. The algorithm uses image processing and compares the previously fed images and parameter with the new ones thus efficiently differentiating between free path and obstacle. The system can enhance the safety of the whole vehicle as well as the safety of the driver. If in case there is an event of accident the system will send a message to the nearest police station as well as some local hospital, also the system will alert the user's relative in any such event. This is achieved by the GSM module, the system in such cases requires proper network connectivity which is trivial in modern age.

V. CONCLUSION

In this system, a model is created which will detect if an image taken by the system camera contains pedestrians or not. The algorithm extracts feature from a given image, these features are then fetched to the model to detect any obstacle or pedestrian. The system will extract important features which will be more related to the human body thus increasing the detection accuracy. The system will have an alert system to alert the driver and further a vehicle slow down mechanism can also be implemented. In case of any mishap like accident, the system will alert the local police station, hospital and the relatives of the user.

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