

Highrange or Rural Road Driver Assistance System

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Abstract— Extra alert is required when driving on "thrilling streets" since they are frequently not intended for effective fast travel like urban roadways. Mountain streets are frequently unreasonably thin for two vehicles to pass effectively and have numerous sharp bends that avert seeing moving toward traffic. The framework proposes a technique for the decrease of mishaps on perilous and daze curves. It coordinates a picture preparing innovation with installed framework. Video taken from a camera that is put before the vehicle is persistently prepared a tangle lab programming. Where the video is changed over into twofold structure and the edges are identified utilizing Hough change strategy. Which distinguish the bend of the street and a sign is given to a micro controller unit, where the vehicle speed is diminished by the consolidated activity of microcontroller and ECU unit in the vehicle. The speed decrease of vehicle in bends will lessen the quantity of mishaps.

Keywords—Curve roads, accident prevention, sensor, mountain road, hill roads, alerting the driver. (Key words)

I. INTRODUCTION

The quantity of deadly street mishaps is increasing day by day and has been an extraordinary test put before general wellbeing and concerned offices. Consistently in papers the primary news in the first page is a street mishap. The most unmistakable passing of the present population is a direct result of street mishaps [1]. More than 1, 37,000 individuals were murdered in street mishaps in 2013 alone. This check is more than the quantity of soldiers relinquished their lives on battle fields. There are numerous explanations behind street mishap happenings like inappropriate development and upkeep of the streets, congestion and expanding check of vehicles. Aside from this, the absence of street sense by the drivers and different clients of the street have additionally convoluted the issues. For the most part the adolescents are losing their lives on streets as a result of rash driving, tanked driving and different reasons, which is an incredible misfortune for our country [2]. As per the World Health Organization, street traffic wounds caused an expected 1.25 million passing worldwide in the year 2010 for example one individual is killed in every second [3]. There were 464,000 street mishaps in 2015 in India. The states Tamil Nadu and Maharashtra announced (3,668) and (3,146) for example the biggest number of individuals slaughtered in bike mishaps, while Uttar Pradesh announced biggest number of lives lost because of (5,720) truck mishaps and (2,135) fender benders [4]. A Report on Road Accidents in India 2016, distributed by Transport Research wing under Ministry of Road Transport and Highways, Government of India, has uncovered that the nation recorded at any rate 4,80,652 mishaps in 2016, prompting 1,50,785 deaths. The number recommends that in any event 413 individuals passed on consistently in 1,317 street mishaps [5]. At present India represents 10 percent of worldwide street mishaps with more than 1.46 lakh fatalities every year?

II. RELATED WORKS

A. Sensor Based Accident Prevention System

Since we are discussing mountain streets here opposite side may be led keeping to a precipice. The answer for this issue is alarming the driver about the vehicle originating from inverse side. This is finished by an ultrasonic sensor in one side of the street before the bend and keeping a LED light after the bend, so that if vehicle originates from one end of the bend sensor faculties and LED light shines at the contrary side. By taking a gander at the LED light on/off criteria driver can wind up caution and can hinder the speed of the vehicle. [6]

B. Diminishing Road Accidents On Sharp Curves Using Arduino

The fundamental point of this framework is to decrease mishaps on bumpy and tricky streets. In bend streets the other street end of vehicle can't see by driver. During the night mishaps may occur by force of head light from inverse side of vehicles. Likewise, the light force issue happens both bended streets and mountain streets, Thousands of individuals lose their lives. The answer for this issue is alarming the driver about the vehicle originating from inverse side. This is finished by keeping an ultrasonic sensor in one side of the street before the bend and keeping a LED light after the bend, so that if vehicle originates from one end of the bend sensor faculties and LED light shines at the contrary side estimates proportionately more than is standard. This estimation and others are purposeful, utilizing details that foresee your paper as one piece of the whole procedures, and not as a free archive. Kindly don't amend any of the present assignments.

III. SYSTEM DESCRIPTION

A. PRINCIPLE

The bend is distinguished by consistent assessment of the street utilizing a camera that is put before the vehicle. The video is changed over into edges and prepared inside MATLAB programming. Where the video is changed over into paired picture and the bend is recognized utilizing neural systems administration. A sign from the pc is sent through a remark to the microcontroller unit, where the speed of vehicle is over as far as possible vehicle will consequently back off. The notice is sent through a buzzer and through an LCD display.

picture). We are keen on the area of every pixel which will be essentially moved to another position.

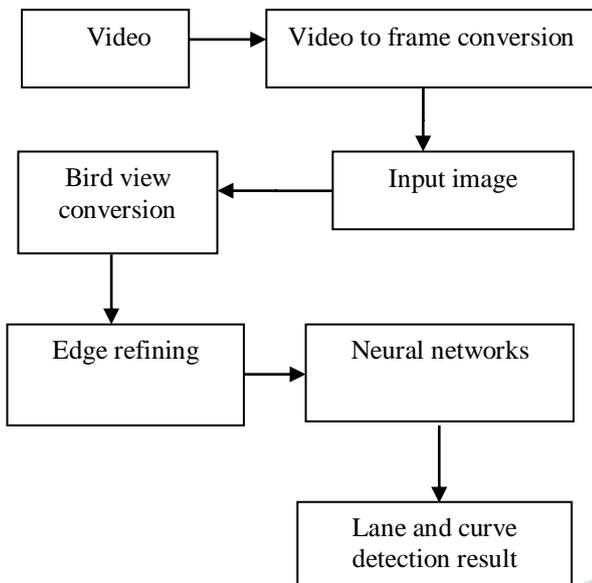


Fig 1. Block diagram for video processing

C. PREPROCESSING

Image preprocessing is a typical name for activities with pictures at the most reduced dimension of reflection. Its information and yield are power pictures. The point of pre-preparing is an improvement of the picture information that smothers undesirable bends or upgrades some picture highlights significant for further handling. Picture rebuilding is the task of taking a corrupted/noisy picture and evaluating the spotless unique picture. Debasement may come in numerous structures, for example, movement obscure, commotion, and camera miscues. Picture reclamation is not quite the same as picture upgrade in that the last is intended to underline highlights of the picture that make the picture all the more satisfying to the eyewitness, yet not really to deliver reasonable information from a logical perspective. Picture improvement systems (like difference extending or de-obscuring by a closest neighbor methodology) given by Imaging bundles utilize no from the earlier model of the procedure that made the picture. With picture upgrade commotion can be viably be expelled by yielding some goals, yet this not worthy in numerous applications. In a Fluorescence Microscope goals in the z-course is awful all things considered. Further developed picture handling procedures must be connected to recuperate the article. De-Convolution is a case of picture rebuilding strategy. It is able to do Increasing goals, particularly in the axial direction evacuating noise and expanding contrast.

D. BIRD EYE CONVERSION

S Eye View change strategy is to produce a top view viewpoint of a picture as appeared in Figure. This method can be characterized under computerized picture handling as geometrical picture change. Fundamentally, the bird's eye view change can be partitioned into three stages. To begin with, we need represent the image in a shifted coordinate system, next perform rotation of image, and then project the image on a two-dimensional plane. The square chart for change is given in Figure 2. Picture by and large is spoken to as two-dimensional grids, where every area speaks to a pixel esteem which is between 0 to 255 (for an 8-bit grayscale

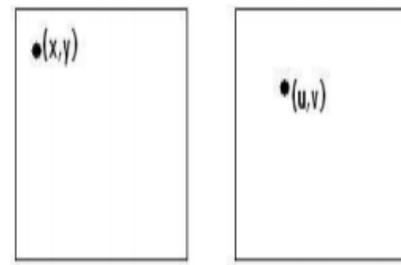


Fig 2. Block diagram for transformation

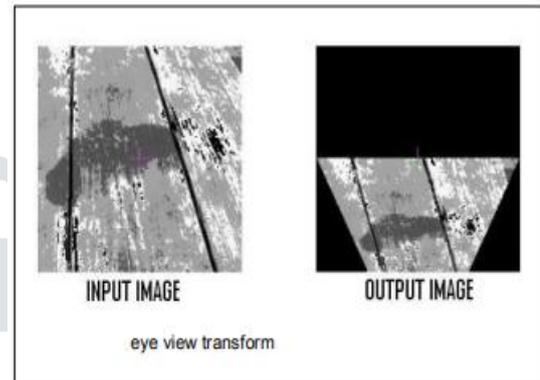


Fig.3. Top view perspective of a image

E. COORDINATE SHIFTING

Image is commonly represented as a two-dimensional plane for example x and y plane. Along these lines, in the event that the extent of a picture is 100 × 100, at that point every pixel area is spoken to as appeared in Fig.4. To perform revolution of picture first we have to apply an adjustment in facilitate position with the end goal that the picture Center is situated at (0, 0), in this manner in a 100 × 100 picture beginning stage is (- 50, - 50) and summation point at (49, 49) as appeared in Fig. 2. In the event that (x, y) speak to the directions of a picture at that point moved arrange is given by (X, Y) as appeared in fig 1 and fig 2.

$$X = x - (\text{IMAGE SIZE} / 2) \text{ -- (1)}$$

(-50,-50)(-50,-49)(-50,-48) ---- (-50,48)(-50,49)
 (-49,-50)(-49,-49)(-49,-48) ---- (-49,48)(-49,49)

(49,-50)(49,-49)(49,-48) ----- (49,48) (49,49)

(-50,-50)(-50,-49)(-50,-48) ---- (-50,48)(-50,49)
 (-49,-50)(-49,-49)(-49,-48) ---- (-49,48)(-49,49)
 (49,-50)(49,-49)(49,-48) ----- (49,48)(49,49)

Fig 4. Representation of image in pixel location

On the off chance that the camera is mounted at 450 edges to ground and we attempt to pivot the picture by 450 then what we get is the top perspective on the given picture as appeared in Fig. 1. Consequently, our procedure produces an elevated view change dependent on manual perception or by knowing the edge at which camera is mounted, this procedure can likewise be computerized by strategies. After pivot is played out the tallness of the picture diminishes thus, we have to extend the stature of the picture, which is finished by utilizing framework SH. In the event that $S_x = 2$, at that point the stature will turn out to be twice that of unique.

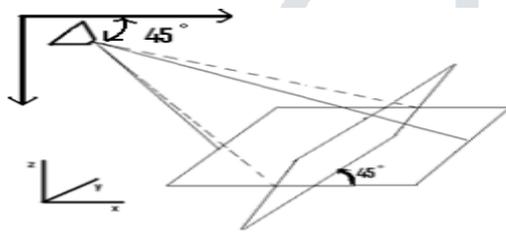


Fig.5. Rotation of image on z axis

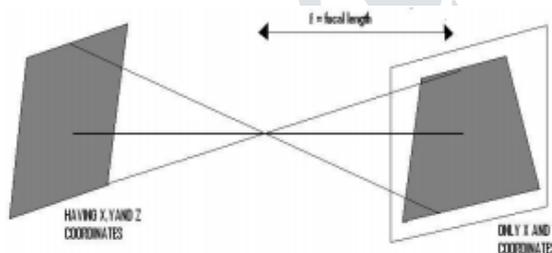


Fig.6. Projection into a 2D image plane

F. PROJECTION OF IMAGE ON TWO-DIMENSIONAL PLANE

The picture must be again spoken to in 2D plane for which the picture must be anticipated from the 3D plane to 2D plane like a straightforward stick opening camera model. A straightforward projection recipe can be composed utilizing comparative triangles, where (p, q, r) are the positional facilitates in 3D plane and (u, v) are the yield picture organizes. Here f speaks to central length as per basic stick entire camera model. Central length can have any discretionary esteem. The positional organize of the yield picture will have whole number qualities henceforth the facilitate moving is connected to get the directions in entire number.

G. NEURAL NETWORKS

Neural systems are prescient models inexactly dependent on the activity of natural neurons. The determination of the name "neural system" was one of the incomparable PR triumphs of the Twentieth Century. It unquestionably sounds more energizing than a specialized depiction, for example, "A system of weighted, added substance esteems with nonlinear exchange capacities". Be that as it may, regardless of the name, neural systems are a long way from "thinking machines "or "artificial brain". A regular counterfeit neural system may have a hundred neurons. In correlation, the human sensory system is accepted to have about 3×10^{10} neurons. We are still light a very long time from "Information". In spite of the fact that the usage is altogether different, neural systems are theoretically like K-Nearest Neighbor (k-NN) models. The fundamental thought is that an anticipated target estimation of a thing is probably going to be about equivalent to different things that have close estimations of the indicator factors. Consider this figure:

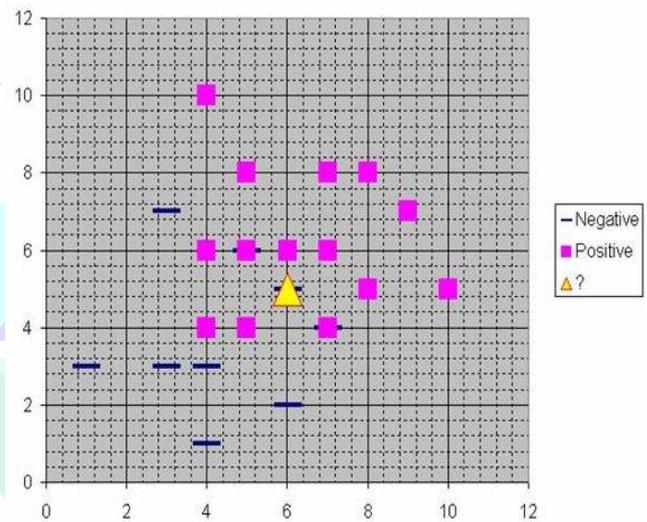


Fig.6. Neural networks

Expect that each case in the preparation set has two indicator factors, x and y. The cases are plotted utilizing their x, y arranges as appeared in the figure. Likewise accept that the objective variable has two classifications, positive which is indicated by a square and negative which is signified by a dash. Presently, assume we are attempting to foresee the estimation of another case spoken to by the triangle with indicator esteems $x=6, y=5.1$. Would it be advisable for us to anticipate the objective as positive or negative? Notice that the triangle is position precisely over a dash speaking to a negative esteem. Be that as it may, that dash is in a genuinely bizarre position contrasted with different dashes which are bunched beneath the squares and left of focus. In this way, it may be the case that the hidden negative esteem is an odd case

The closest neighbor grouping performed for this precedent relies upon what number of neighboring focuses are considered. In the event that 1-NN is utilized and just the nearest point is considered, at that point obviously the new point ought to be delegated negative since it is over a known negative point. Then again, if 9-NN arrangement is utilized and the nearest 9 points are considered, at that point the impact of the encompassing 8 positive focuses may overbalance the nearby negative point. A neural system

expands on this establishment and sums it up to think about the majority of different focuses. The separation is figured from the fact of the matter being assessed to every one of different focuses, and a spiral premise work (RBF) ((also called a *kernel function*) is connected to the separation to register the weight (impact) for each point. The spiral premise capacity is so named in light of the fact that the sweep separation is the contention to the capacity. The further some other point is from the new point, the less influence it has.

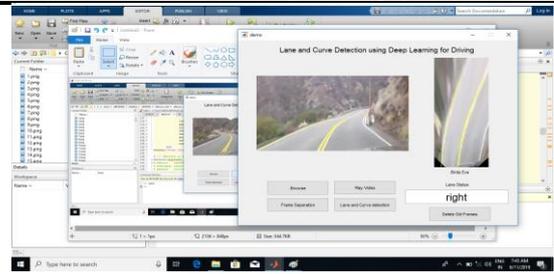


Fig.10. Curved road towards right

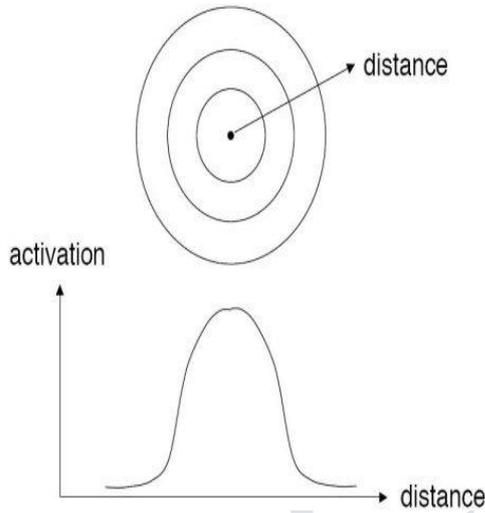


Fig.7. Distance computation of each point

IV RESULT

The matlab results is shown in user interface. The three different road structures are detected using neural networking such as straight road, curved road for both left and right turning. Which is shown in Fig.8, Fig.9 and Fig.10.

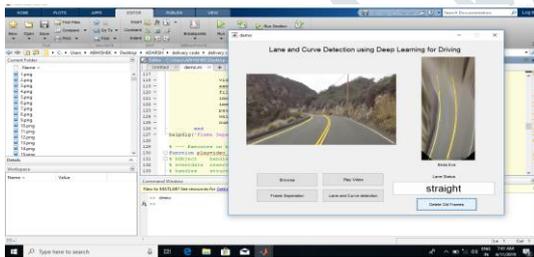


Fig 8. Straight road

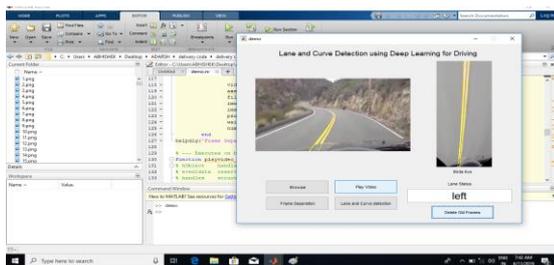


Fig.9. Curved road towards left

V CONCLUSION

They are referred to as “Dead-man’s Curves” in movies and ghost tales, but dangerous roadway curves cause too many car accidents in real life. These types of car accidents are often fatal or cause serious and crippling injuries. Deadly curve-caused car accidents are often the result of speeding or inattentive driving. Driving at high speeds and not realizing the severity of a turn can cause drivers to lose control of their cars, leave the road and slam into a barrier or tree. A drunk driver is also at risk when approaching a deadly curve. The best way to prevent a car accident caused by a dangerous curve is to drive carefully. By driving at the posted speed limit, you will be able to smoothly slow down to a safe speed to navigate the curve. This will prevent the car from rolling over and leaving the road on a sharp turn. Hence by using neural networking we can find out dangerous curves in front of the vehicle. Any form of destruction to the driver will not affect the driver from taking the action to control the vehicle, thereby we can reduce large amount of casualties.

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