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AN IDEAL MODEL FOR RECOGNITION OF TRAFFIC SYMBOL USING COLOR AND MORPHOLOGICAL STRUCTURE

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Abstract - This project introduce due increase in road accident now a days because of some negligence of traffic sign on road.to reduce this road accident people need to see the traffic signs display on road and they need to follow it proporly.in this project we use high resolution camera, java base software etc. many system are exited for traffic sign detection most of them are having performance issues, so this paper introduce us some novel idea to overcome this performance issues for traffic sign detection. This propose system work in flow like it first capture then divide that image in blocks and then with the help of colour, shape identification it will detect that sign image.

Key Words: image block, colour identification, block labelling, edge analysis, shape identification, block correlation, fuzzy, symbol clarification. Symbol identification.

1. Introduction

Vehicles are increase so much now a days and there is also
Increase in road accident. For ex. if a driver drive a car With 50 km/hr and on road there is suddenly road crossing sign. If driver not able to see that sign then there must be chances of accident. So to avoid such kind of road accident, driver need to have some information about the traffic signs on road. hence automation navigation for
Driver is important. These system needs to be very fast and robust for detection of road sign. There are various Sign on road like restriction, warnings etc. to overcome this road accident this propose system get introduce. Vehicles are increase so much now a days and there is also increase in road accident. For ex. if a driver drive a car with 50 km/hr and on road there is suddenly road crossing sign. If driver not able to see that sign then there must be chances of accident.so to avoid such kind of road accident, driver need to have some information about the traffic signs on road. Hence automation navigation for driver is important. These system needs to be very fast and robust for detection of road sign. There are various sign on road like restriction, warnings etc. to overcome this road accident this propose system get introduce.

2. Literature Survey

The authors Keren-Fu, Irene Y.A.Gu,Anders odblom in those paper(Traffic sign recognition using salient region feature: A novel learning base course to fine scheme).
How it is work: they implemented traffic sign detection using following methods
A) Traffic sign detection system method.
1) Image segmentation followed by region analysis.
2) Edge base shape discovery.
3) Sliding window detection.
B) Traffic sign classification schema.
1) Course to fine classification.
C) Performance of sign detection.
D) Performance of sign classification.
E) Combination of category.
Disadvantages
1) Sign in same category share some common attributes and appearance. So there is little difficult to detect sign.
2) This paper will not evaluate the 100% outcome on the test data set it has still 0.3% false positivity.[1]
Traffic Sign Recognition Using Neural Network
This paper contains following step
1)Image extraction: in this stage the video image view has been taken by video camera and the image extraction blocks are responsible for creating images and sign detection and extraction generates the small image called as blocks and such blocks will perform in recognition stage using artificial neural network.

2) Traffic sign pre-processing stage: sign detection and Extraction: - this is the image processing process. The image is taken from video camera. That image reads both in black and white colour mode. Then recording to threshold will be identified. This is traffic sign detection system using neural network technique such as threshold technique. Gaussian filter [2].Recognition of Traffic Sign Using SVM

The object of this paper is traffic sign detection and recognition from the traffic panel board it detect the traffic sign. Image are captured through the camera it is invariant to size then it is scaled. this system work on following method.

1. Edge detection: In this stage intensity variation are detected from and input image. This method using various techniques such as morphological operation, thresholding techniques, gradient mask calculation.
2. Thresholding: This is use for partitioning an image into records partition called as region. Different region are obtain for various thresholding values.
3. Morphological operation: there are various morphological operations are perform to get output in this stage. The connected border are removed to give a needed portion as an output.
4. Extraction of traffic sign: in this stage traffic sign are identified. This system use under special road condition such as entrance to one way street traffic, Sharpe curve and interaction without traffic sign. Identification traffic sign correctly at the right time and right place is very important for vehicle drivers to ensure themselves and passengers safe journey. Sometimes due to the change in whether condition and viewing angles, traffic sign are difficult to see.[3]

3. Proposed System

Intelligent Speed Adaption (ISA) is called as altering and intelligent Authority, is any system that ensures that vehicles speed does not exceed a safe or legally enforced speed. in case of potential speeding, a human driver can be alerted or speed reduced automatically. ISA uses information about road to determine the required speed. Information can be obtained from knowledge of the vehicles position. ISA system are designed to detect and alert a driver when a vehicle has entered different speed. That is the main goal behind the traffic sign recognition for the safety of driver of crossing speed limit of vehicle. Given an input image, we reset scale it to pixel width (since our images are captured in complex street scenes, some signs are really small as compared with the original image). An image pyramid is formed by consequent subsampling (8 scales in each octave). A sliding window 5656 is performed on each scale with stride 4. When a sign is detected, its local image S is resized to 200 200 to performance super-pixel segmentation (500 superpixels) and the geodesic propagation. Segmented masks are then scaled to their original sizes. To test the proposed sign detection method, many street view images are automatically collected to form a dataset. Each image contains at least one sign from set of images. The dataset is then split into training and testing sets. Training samples are obtained from only the training set. To test sign classier, we further collect samples and manually categorize them into classes. There are 15 classes for prohibitory signs and 16 classes for warning signs, depending on whether a class appears frequently enough in the collected dataset.Classes that are rare or without appearance are ignored. Each sign class contains approximate 200 sign samples.

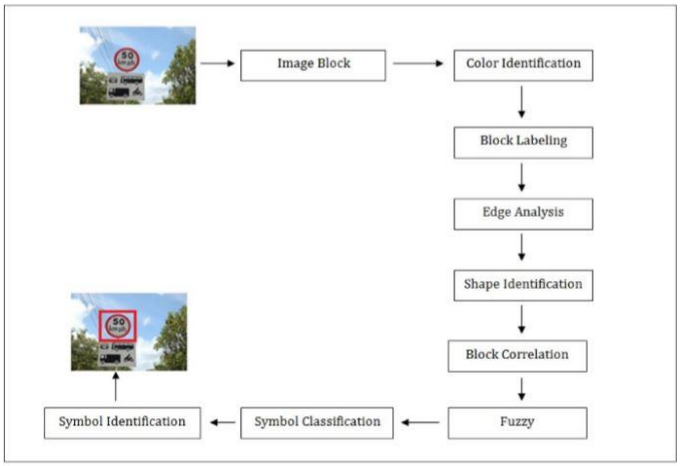

Fig. Architecture diagram

3.2 Mathematical Model

Mi =Morphology identification Bcr= Block Correlation F = Fuzzy logic 5. S = I, Vf, Bc,Ci Mi ,Bcr, F,T Input : (A) Set Theory

1. S= be as system for Traffic Symbol Identification
2. Identify Input as I Where I= Input Image 3. Identify T as Output i.e. Traffic Symbol Detection.

S= I, T 4. Identify Process P S= I , P,T P= Vf, Bc,Ci Mi,Bcr,Fl Where Vf = Video frame Bc=Block Creation Ci =Colour identification
(B) SET DESCRIPTION: 1. Video frame:
Set Vf: Vf 1 = Capturing camera content Vf 2= Adding to video track Vf 3= Grab frame content Vf 4= prepare image object
2. Block Creation: Set Bc: Bc1=Image pixel Matrix Bc2=Threshold size analysis Bc3=Block Creation
3. Color identification:
Set Ci: Ci 1= Read RGB value of a pixel Ci 2= Analyse RGB values Ci 3= Label Pixels 4. Morphology identification
Set Mi:
Mi 1= Get image height and weight Mi 2= Get RGB values of a pixel Mi 3= Get the axis distance Mi 4= Calculate co-axial ratio Mi 5= Create morphological vector 5. Block Correlation set Bcr: Bcr1:Pixel colour ratio Bcr2:Ratio vector Bcr3:Pearson co-relation
6. Fuzzy logic Set F: Fl=Crisp values F2=Fuzzier F3=De fuzzy verification F4=If-then Rules F5=Traffic symbol identification and recognition.
(C) Representation of Sets and its operation:- 1. Union Representation:- A. Set Vf = Vf 1, Vf 2, Vf 3, Vf 4 Set Bc = Bc 1, Bc 2, Bc 3 Set (Vf U Ci) = Vf 1, Vf 2, Vf 3, Vf 4, Bc 1, Bc 2, Bc 3 B. Set Ci = Ci 1 , Ci 2, Ci 3
Set (Vf U Bc U Ci) = Vf 1, Vf 2, Vf 3, Vf 4, Bc 1, Bc 2, Bc 3, Ci 1 , Ci 2, Ci 3
C. Set Mi = Mi1, Mi2, Mi3, Mi4, Mi5
Set (Vf U Bc U Ci U Mi) = Vf 1, Vf 2, Vf 3, Vf 4, Bc 1, Bc 2, Bc 3, Ci 1 , Ci 2, Ci 3, Mi1, Mi2, Mi3, Mi4, Mi5
D. Set Bcr = Bcr1, Bcr1 Bcr3
Set (Vf U Bc U Ci U Mi U Bcr) = Vf 1, Vf 2, Vf 3, Vf 4, Bc 1, Bc 2, Bc 3, Ci 1 , Ci 2, Ci 3, Mi1, Mi2, Mi3, Mi4, Mi5 , Bcr1, Bcr1 Bcr3
E. Set F = F1, F2, F3, F4, F5
Set (Vf U Bc U Ci U Mi U Bcr U F) = Vf 1, Vf 2, Vf 3, Vf 4, Bc 1, Bc 2, Bc 3, Ci 1 , Ci 2, Ci 3, Mi1, Mi2, Mi3, Mi4, Mi5 , Bcr1, Bcr1 Bcr3, F1, F2, F3, F4, F5

3.3 Algorithms

1) **Algorithm for Mean and Standard Deviation Calculation:**

Step 0: Start

Step 1: Get Image path.

Step 2: Get Height and width of the Image (L*W).

Step 3: Declare MR=0, MG=0, MB=0

Step 4: FOR x=0 to width.

Step 5: FOR y=0 to Height.

Step 6: Get a Pixel at (x, y) as signed integer.

Step 7: Convert pixel integer value to Hexadecimal to get R, G, and B.

Step 8: MR=MR+R , MG=MG+G, MB=MB+B

Step 9: End Inner FOR

Step 10: End Outer FOR

Step 11: MR=MR/(L*W) , MG=MG/(L*W) , MB=MB/(L*W)

Step 12: Declare VR=0,VG=0,VB=0

Step 13: FOR x=0 to width

Step 14: FOR y=0 to Height

Step 15: Get a Pixel at (x, y) as signed integer

Step 16: Convert pixel integer value to Hexadecimal to get R, G, and B.

Step 17: VR= VR+ (R-MR)* (R-MR)

Step 18: VG= VG+ (G-MG)* (G-MG)

Step 19: VB= VB+ (B-MB)* (B-MB)

Step 20: End Inner FOR

Step 21: End Outer FOR

Step 22: VR=VR/(L*W) , VG=VG/(L*W) , VB=VB/(L*W)

Step 23: SR= SQRT(VR) , SG=SQRT(VG) , SB=SQRT(VB)

Step 24: Stop

2) Algorithm for Block Creation:

Input : Image File I

Output: Image Blocks

Step 0: Start

Step 1: Get Image path.

Step 2: Get Height and width of the Image (L*W).

Step 3: Declare MR=0, MG=0, MB=0

Step 4: FOR x=0 to width.

Step 5: FOR y=0 to Height.

Step 6: Get a Pixel at (x, y) as signed integer.

Step 7: Add Signed integer to the block matrix BM

Step 8: if BM size is = threshold

Step 9: Dump matrix to a Block list BL

Step 9: End Inner FOR

Step 10: End Outer FOR

3)Pearson Correlation Algorithm:

// input: Two parameter matrix of N rows and 2 columns and Let matrix be M

// output: Pearson factor (i.e in between 0 to 1)

0: Start

1: Calculate sum of square of column 1 as SS1

2: Calculate sum of square of column 2 as SS2

3. Calculate square of mean of column 1 as m1

4. Calculate square of mean of column 2 as m2

5. Calculate square root of SS1-m1 as SQ1

6. Calculate square root of SS2-m2 as SQ2

7. Calculate denominator as DR as SQ1 * SQ2

8. Calculate sum of column 1 as sum1

9. Calculate sum of column 2 as sum2

10. Calculate product of sum1 and sum2 as TP

11. Calculate Mean product as MP as TP/ N

12. Calculate sum of product of all rows as PS

13. Calculate nominator as NR as MP*PS

14. Calculate Pearson coefficient as NR/DR

15. Return Pearson coefficient

16: Stop

4 CONCLUSIONS

We have proposed a real-time system for the automatic detection and recognition of traffic signs or symbols .The images were pre-processed in stages with image processing techniques, such as, Canny edge detection, Gaussian filter, threshold technique, Fit Ellipse and Contour. First the camera captures the image or detects the sign image, and through the detection algorithm the sign is identified and to be informed to the vehicle driver, and through this system the various accidental conditions will be reduced.

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