ACCIDENT AVOIDANCE BY USING ROAD SIGN RECOGONITION SYSTEM

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ABSTRACT:

Traffic Sign Recognition (TSR) systems employ vehicle mounted cameras that identify traffic signs while driving on the road. Typically, these systems recognize speed limit signs, stop signs and warning signs such as pedestrian crossing, railroad crossing etc. Their primary function is to inform the driver of recent traffic signs that may have been missed due to distraction or inattentiveness. A camera scans the roadside for signs. Real-time image processing software identifies, interprets and displays them on a panel on the vehicle dashboard. TSR systems perform the following basic functions. This project runs on Raspberry Pi platform. The Raspberry Pi is a credit card sized single computer or SoC uses ARM1176JZF-S core. System on a Chip, is a method of placing all necessary electronics for running a computer on a single chip. It needs an Operating system to start up. SD/MMC card will acts as a bootable hard disk.

The **Raspberry Pi** gets the first half of its name from a long-standing tradition of using fruit to name new computing systems— from classic microcomputers like the Acorn, Apricot and Tangerine to more recognizably modern brands including Apple and BlackBerry—but the second half comes courtesy of the Python programming language.

Flexible and powerful, Python was originally developed in the late 1980s at the National Research Institute for Mathematics and Computer Science by Guido van Rossum as a successor to the ABC language.

Since its introduction, Python has grown in popularity thanks to what is seen as a clear and expressive syntax developed with a focus on ensuring that code is readable. Python is a high-level language. This means that Python code is written in largely recognizable English, providing the Pi with commands in a manner that is quick to learn and easy to follow. The high-level nature and clear syntax of Python make it a valuable tool for anyone who wants to learn to program

LITERATURE REVIEW:

Yanjun Fan, Weigong Zhang "Traffic Sign Detection and Classification for Advanced Driver Assistant Systems"

Traffic signs include many useful environmental information which can help drivers learn about the change of the road ahead and the driving requirements. Therefore, more and more scholars have concentrated on the issues about recognition the traffic signs by using computer vision and machine learning techniques. And now, traffic signs recognition algorithm has become an important part of Advanced Driver Assistance Systems (ADAS). A novel traffic signs recognition algorithm, which based on machine vision and machine learning techniques, is proposed in this paper. There are two steps in our algorithm: detection and recognition. First of all, the candidate regions are detected by using the color features of the pixels in the detection step. Next, the cascaded Feed forward Neural Networks with Random Weights (FNNRW) classifiers are utilized for shape and

content recognition. The experimental results indicate that the average running time of the whole system is less than 40ms, with an accuracy rate of about 91 percent. Therefore, the proposed system has good performance both in accuracy and efficiency and is suitable for the application of Advanced Driver Assistance Systems.

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With the rapid development of road transportation system and the automobile industry, the issues about road safety has been paid more and more attention in our world. Advanced Driver Assistance Systems ,which can help drivers react appropriately to the road environment changing and improve the safety of driving, have become a field studied popularly in the world recently . There are many useful road environmental information in the traffic signs which can help drivers make aware of the road environment changing and improve driving safety. In the field of traffic sign detection, the machine vision techniques are widely used and more and more scholars have concentrated on the issues. In recent years, many researchers utilized many sophisticated methods in order to resolve this problem . There are many distinguishing features of the traffic signs which can be used for their detection and recognition, such as colors and shapes

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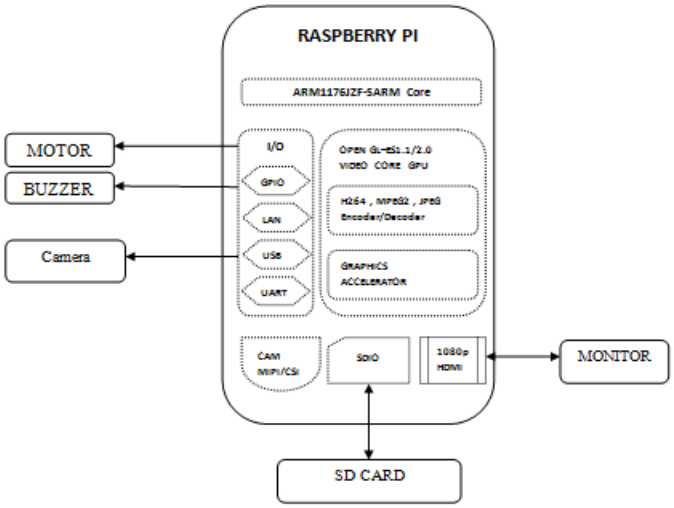
- bad weather conditions, illumination variations and poor image quality;
- occlusion, rotation and deterioration of the traffic signs;
- the real-time requirements of some on board system such as ADAS.

3. BLOCK DIAGRAM:



P1: The Main GPIO connector

WiringPi Pin	BCM GPIO	Name	Header		Name	BCM GPIO	WiringPi Pin
		3.3v	1	2	5v		
8	Rv1:0 - Rv2:2	SDA	3	4	5v		
9	Rv1:1 - Rv2:3	SCL	5	6	0v		
7	4	GPIO7	7	8	TxD	14	15
		0v	9	10	RxD	15	16
0	17	GPIO0	11	12	GPIO1	18	1
2	Rv1:21 - Rv2:27	GPIO2	13	14	0v		
3	22	GPIO3	15	16	GPIO4	23	4
		3.3v	17	18	GPIO5	24	5
12	10	MOSI	19	20	0v		
13	9	MISO	21	22	GPIO6	25	6
14	11	SCLK	23	24	CE0	8	10
		0v	25	26	CE1	7	11
WiringPi Pin	BCM GPIO	Name	Header		Name	BCM GPIO	WiringPi Pin

4. PROPOSED WORK

The camera is connected to raspberry pi, which is used to provide input. The input is given to a key-point detector to extract key-points in the input image, then the descriptions of the image is found using these key-points. The same is done pre-ready for the signals in database. Then the descriptions of image and signal in database are sent to a matcher, which matches them and returns best matches. Then we detect number of matches. If the match count for that image is greater than certain predefined threshold, then we can say there is a signal present in that image. But all signals are undergone the above mentioned process, to make sure the highest matched signal is chosen.

Here we are using ORB (Oriented FAST and Rotated BRIEF) for detecting key-points and descriptions, where FAST stands for Features from Accelerated Segment Test, and BRIEF stands for Binary Robust Independent Elementary Features. We are using BF Matcher (Brute Force Matcher) to match descriptions.

5. CONCLUSION

A novel traffic sign detection and classification approach was presented in this paper. In our method, there are two main stage: detection and recognition. The candidate regions are detected based on color enhancement technology and chromatic filter in the detection stage. Firstly, the blue or red color feature is strengthened and the red/blue enhancement image can be obtained. Meanwhile, the white color enhancement image is obtained by using chromatic filter. Secondly, the red/blue enhancement image and the with color enhancement image are process together in order to extract candidate regions from the images.

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