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Traffic sign detection from video using image processing

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ABSTRACT

Since past decades, more people in India are demanding own vehicles. Population in India increases day by day and so transportation methods. Road accidents are increased especially on highways. Many peoples get injured and lost their life because they do not see the road sign boards and also not aware of the meaning of road sign boards. Proposed automatic road sign detection system enhances intelligent transportation system by providing information about road sign to the driver and keeps drivers view on road, which will minimize accidents on the road and saves the life of people. A proposed system identifies the road sign using image processing techniques. A system collects the video of road signs with the help of a camera which is mounted on moving vehicle. Image videos are converted into frames of the image at the rate of 25frames/sec. Image pre-processing techniques such as converting the RGB image to greyscale, resizing of the image are used. Images are enhanced using median filtering technique. To extract features of image speeded-up robust features (SURF) technology is used. The standard road sign images are stored in the database and for classification of features, linear support vector machine (SVM) is used. Results are tested on 10 videos of road signs and it shows that proposed method correctly detects normal, blur and partial view of road sign videos.

Keywords: Traffic sign, Image Processing, classification, Support vector machine, Speeded-up robust features.

1. INTRODUCTION

The main goal of road sign identification using image processing technique is to reduce road accidents. Road signs are designed with regular shapes and primary colors to attract human driver's attention. However, there are many difficulties for identifying road signs due to illumination changes, color deterioration, motion blur, cluttered background and partial occlusion etc. [1]. Vehicles on the road are increasing day by day so numbers of accidents are also getting increased. Road scenes are generally much cluttered and contain many strong geometric shapes that could easily be misclassified as road signs. Accuracy is a key consideration, because even one misclassified or undetected sign could have an adverse impact on the driver [2]. A proposed method collects the video of road signs with the help of a camera which is mounted on moving vehicle. If captured image by camera and stored image in the database are equivalent then the driver will hear sound with the name of corresponding road sign board. Road sign identification using image processing technique does not require an internet connection. Blurred sign as well as a partial view of road sign board are corrected using image processing techniques.

The objective of proposed method is to identify road sign from video captured by camera and provide information to the driver about meaning of corresponding road sign board.

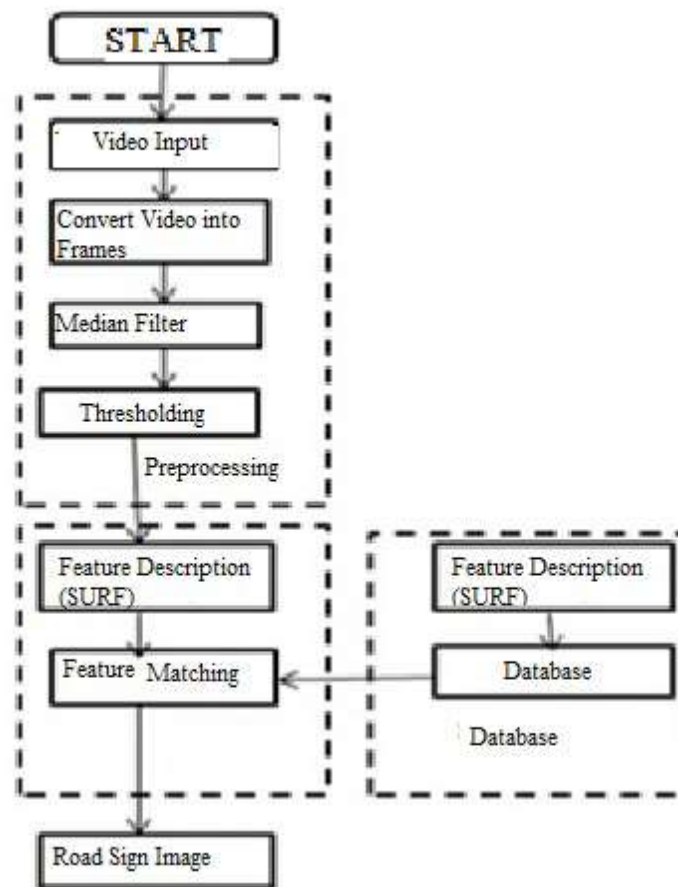
2. SOFTWARE DEVELOPMENT

Flow chart of proposed system and explanation of image processing techniques such as image pre-processing, enhancement, segmentation, edge detection and feature extraction is given in this chapter.

2.1 Flow chart of road sign identification

Figure 2.1 shows flow chart for road sign identification which uses image processing techniques. First the video is stored in memory and then it is processed using MATLAB software. Video is converted into frames. Image pre-processing techniques of converting RGB image to gray scale, resizing of image are used on converted frames. Then Median filter is used to reduce noise without

actually blurring the object. After image enhancement, Image segmentation is used. Image segmentation simplifies the representation of an image into something meaningful object which is easier to analyze. Thresholding method is used as a image segmentation to extract the pixels from image which are the part of an object. Thresholding is the process which converts input gray scale image into binary image with pixel values 0 and 1 only.



Once the pre-processing step is done, next step is to extract important features from an image. For feature extraction Speedup robust feature (SURF) extraction method is used. Then road sign images are classified as per the images stored in database. For classification linear support vector machine technique is used. After classification, a feature matching which consists of detecting a set of interest points from image data is performed. Road sign image is identified after feature matching [12].

3. DESCRIPTION OF ROAD SIGN DATABASE

Classification of the object is an easy task, but it's challenging to the machine. The Image Classification system consists of a database that contains predefined patterns that compare with an object to classify an appropriate category. A database stores 10 road sign images and name of each individual signs. Figure shows some traffic signs.



Figure: Traffic signs

4. COMPARATIVE ANALYSIS

Table shows comparison analysis between the German Traffic Sign Detection Benchmark (GTSDDB) and proposed method. Four road signs are misclassified in German Traffic Sign Detection Benchmark technique. All blurred road signs are misclassified in GTSDDB technique. A proposed method is used to overcome above problem. Using proposed method only one sign gets misclassified (i.e. U-turn) as database does not store that sign.

Table 1: Comparative analysis

Method	No. of road signs	Detected signs	Misclassified Signs
German Traffic Sign Detection Benchmark	10	6	410
Proposed System	10	9	1

5. CONCLUSION

A proposed method identifies the road signs using augmented reality and image processing technique. Image preprocessing methods such as converting RGB image to gray scale, resizing of image are efficiently used. Images of road signs are enhanced using median filtering technique. After enhancement, thresholding method is used to convert grey scale image into binary image. Sobel edge detection reduces image size successfully and preserving the important structural properties of an image. Speeded-up robust feature (SURF) descriptor is used for extracting road sign image features. The standard road sign images are stored in database and for classification of features linear support vector machine (SVM) is used. It delivers unique solution and very efficient image classification method. SVM is able to deal with large amount of dissimilar information. A proposed method does not require internet. It successfully detects blur and partial view of road sign image.

6. REFERENCES

- [1] A. Mogelmose, M. M. Trivedi, and T. B. Moeslund, "Vision-based traffic sign detection and analysis for intelligent driver assistance systems: Perspectives and survey," *IEEE Trans. Intell. Transp. Syst.*, vol. 13, no. 4, pp. 1484-1497, Dec. 2012.
- [2] Azuma, R., Baillot, Y., Behringer, R., Feiner, S., Julier, S., MacIntyre, B. Recent advances in augmented reality, *IEEE Computer Graphics and Applications* 21(6), pp.3447, 2001.
- [3] J. Greenhalgh and M. Mirmehdi, "Real-time detection and recognition of road traffic signs," *IEEE Trans. Intell. Transp. Syst.*, vol. 13, no. 4, pp. 1498-1506, Dec. 2012.
- [4] Y. Yang, H. Luo, H. Xu, and F. Wu, "Towards real-time traffic sign detection and classification," in *Proc. IEEE 17th ITSC*, pp. 8792, Oct. 2014.
- [5] C. Liu, F. Chang, Z. Chen and D. Liu, "Fast Traffic Sign Recognition via High-Contrast Region Extraction and Extended Sparse Representation," *IEEE Transactions on Intelligent Transportation Systems*, Vol. 17, January 2016.
- [6] Zumra Malik and Imran Siddiqi, "Detection and Recognition of Traffic Signs from Road Scene Image," *12th IEEE International Conference on Frontiers of Information Technology*, pp.330-335, 2014.
- [7] Andreas Mogelmose, Mohan Manubhai Trivedi, and Thomas B. Moeslund, "Vision-Based Traffic Sign Detection and Analysis for Intelligent Driver Assistance Systems: Perspectives and Survey," *IEEE Transaction on Intelligent Transportation Systems*, Vol. 13, No. 4, December 2012.
- [8] L.Chen, Q. Li, M. Li and Q. Mao "Traffic Sign Detection and Recognition for Intelligent Vehicle," in *IEEE Intelligent Vehicles Symposium*: 908-913, 2011.
- [9] Jian Fan, "Enhancement of Camera-captured Document Images with Watershed Segmentation," *CBDAR, Curitiba, Brazil*, pp.87-93, 2007.