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Automatic Helmet Wearing Detection on Public Roads Using Embedded System

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ABSTRACT:

In this paper, a novel and practical automatic helmet detection framework based on computer vision, machine learning and image processing is proposed. The goals are the study and implementation of some methods for automatic helmet wearing detection on public roads [1], Traffic images captured by cameras were used. They are the way of communication in humans which convey many things non- verbally. During the current years object recognition has received significant attention as one of the important applications of image or video analysis and implementation. The detection of whether wearing helmets or not, automated mechanisms to inspect traffic violations Moreover, based on the result of helmet detection, real-time human classification framework is applied accurately and quickly. In this paper we present Helmet detection techniques using Viola and Jones algorithm and embedded system.

INDEX TERMS: Object recognition, Helmet detection system, Viola and Jones algorithm Embedded system.

1.INTRODUCTION

Object detection means object class such as cars, faces in a given image or a video sequence. It is also in the both image and Video database. It has many applications in computer based vision. Object detection has been regarded as the most complex and challenging problem in the field of Image processing, due to the large intra-class variations caused by the changes in object . Such variations result in the object sharing to be nonlinear and complex in any space which is linear to the original image space. It further complicates the problem of robust object detection. Most of the object detection techniques use's detecting for better results. In current, object recognition has become a progressive area of research. There are many applications and algorithms that to evaluate object detection made by system having database. Object detection technique is having many loop holes while getting better result. The Object detection system is divided into four major steps:

1. Helmet detection
2. Algorithm
3. Feature extraction
4. Classification

2.OBJECTION RECOGNITION:

Principal Components Analysis (PCA) creates Eigen Vectors and Eigen values of given image. This method takes step with many calculations to calculate it. Principal Components Analysis (PCA) is a method of identifying structure in data, and expressing the data in such a method as to highlight their similarities and differences.

1. Get the data
2. Subtract the mean
3. Calculating the covariance matrix
4. Calculate the Eigen vectors and Eigen values of the covariance matrix Choosing components and formatting a feature vector
5. Deriving the new data set
6. Getting the old data back

It is one of the more successful techniques of face recognition. In this project we use PCA after applying Viola Jones method on the image. When you apply viola Jones it extracts the feature of image and detecting the image.

3.VIOLA JONES ALGORITHM:

Is the vehicle for object detection which gave feasible results for real time situations. Paul Viola and Michael Jones had proposed the algorithm in year 2001. It was aimed at targeting the problem of object detection but can also be trained for detecting different object classes. It takes for four stages namely: 1. Haar Feature Selection. 2. Creating an integral image. 3. Adaboost Training. 4. Cascading Amplifiers. Haar Feature selection matches the commonalities found in human.

STEPS:

1. Input Image:
2. Detect Image:
3. Identify image :

4. Colour Space Transformation and Lighting Compensation:
5. High Frequency Noisy Removing:
6. Edge Detection and Size Reduction:

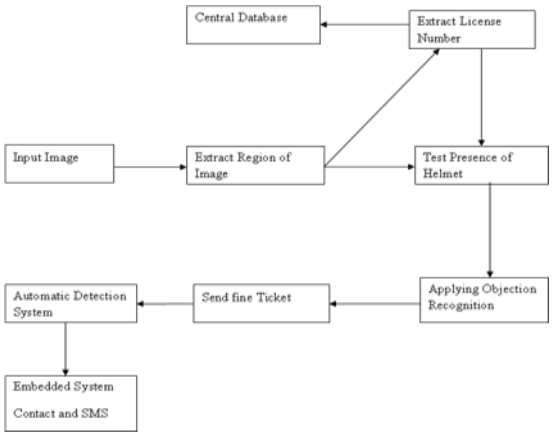
4.EMBEDDED SYSTEM:

Embedded System is a special role of computer system design to perform specific tasks [6]; design engineers can optimize it, reducing the size and cost of the product. Embedded system combines of both hardware and software. Embedded system is fast growing technology in various fields like industrial automation, home appliances, automobiles, aeronautics etc. Embedded technology uses operating systems and microprocessors, controller to do the specified task and the programming is done using assembly language programming or embedded. An embedded system is a computer system designed to perform one or a many dedicated functions often with real-time computing constraints.

4.1 WEB SERVER

This current Paper proposed work is to implement an Embedded Web Server (EWS) based on processor and Linux operating system; it gives a fast and strong networking method with wide range of application areas over internet. The web server runs on an embedded system having restricted resources to serve web page to a web browser.

4.2 SCHEMATIC REPRESENTATION OF ADOPTED METHODOLOGY:



5.CONCLUSION:

This work proposed to illustrates the Automatic Helmet detection using embedded system for object detection, which gives the good performance of the result as compared to conventional object recognition methods. The main limitation of the available object recognition system is that they only detect helmet looking at the camera. In this Paper, we have discussed many techniques used for different method of detecting helmet images. The techniques used in this work detect object and recognize them on the basis of Performance and computational time.

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