Safety Helmet Wearing Detection

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Abstract: **Safety helmet wearing detection is very essential while traveling. We proposed a innovative and practical safety helmet wearing detection method based on image processing and machine learning. At first, the extract background modeling algorithm is exploited to detect motion object under a view of fix surveillant camera in power substation. After obtaining the motion region of interest, the Histogram of Oriented Gradient (HOG) feature is extracted to describe inner human. And then, based on the result of HOG feature extraction, the Support Vector Machine (SVM) is trained to classify pedestrians. Finally, the safety helmet detection will be implemented by color feature recognition. We will also extract number plate of the user without helmet which will be directly connected to their wallet with reference unique id. We will also add face detection feature which will extract face and is send to the RTO office for further penalty.**

Keywords: *Histogram of oriented gradient, Support vector machine, Color feature recognition*.

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I. INTRODUCTION

Our aims to provide total safety for bike riders. Recently helmets have been made compulsory, but still people drive without helmets. Pune City has approx. 35 lakh two-wheeler riders, which includes 500-600 accidents every year out of which 300-400 are fatal. Pune ranks first in the city when it comes to two wheelers riders. In the last few years, there has been rapid increase in number of road accidents. Due to rise in road accidents, it has now become necessary to generate a system to limit accidental deaths.

Lots of accidents occurred in power substation because of not wearing helmet while the working. Safety helmet wearing detection is a very common and crucial task for surveillance in power substation.Whereas there are few researches for studying this problem by using image processing techniques. Most researches focus on the approach investigating of motorcyclists whether wearing or not safety helmets. Waranusast et al.developed an automatically detect system for motorcycle riders and was able to ascertain whether they are wearing helmets or not. This system extracts the motion objects and trains a K-Nearest-Neighbor (KNN) classifier for detection. Silva et al.exploited the Hough circular transformation to determine the shape of safety helmet and use the extracted Histogram of Oriented Gradients (HOG) features to train a Multi-layer perceptron classifier, which can effectively and simply detect wearing helmet of motorcyclists. In power substation, the surveillance camera is installed on the fixed location. So the view of camera is fixed which can make sure that the background cannot change in frames. Consider this characteristic, we choose the ViBe background modelling

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algorithm. Moreover, this method is fast and effective to determine the motion objects. In order to detect the people in power substation whether wearing or not safety helmet, the second step is that obtaining the human location and image information. Thus, we extract the HOG feature of people and train the SVM classifier for people to classify pedestrian in power substation. When we know the human information in frames, we can utilize the color feature to detect safety helmet wearing situations.

II. PROBLEM DEFINITION

To find out by people or police department, lots of documentation and hard work is there also it takes the lot of time duration as well as there is no guaranty of appropriate result. This application contains functionality to add complaint as well as view all complaints. By using these complaints, Trust members will try to find lost person in various areas. This application will upload complaint on web server which can be accessed by any of the trust member having this application.

III. PROPOSED SYSTEM

The main aim of this study is to propose and develop a system for automatic detection of helmets on public roads. The moto of this project is accident prevention by using the methods of helmet authentication, fall detection etc.

Helmet Detection: More than one third who died in road accidents could have survived if they had worn a helmet. Studies shows that usage of helmet can save accident death by 30 to 40%. The rate at which number of two wheelers in India is rising is 20 times the rate at which human population is growing. The risk of death is 2.5 times more among riders not wearing a helmet compared with those wearing a helmet.

➢ SYSTEM ARCHITECTURE

Fig 1-: System Architecture

IV. Results Analysis

A machine learning technique, are used in identification of wearing helmets or not. A total of 100 images belonging to 2 categories were used in this study. Classification processes with ANN was carried out for different training-test rates of images in Table 1. 94% classification rate was achieved for the 70%-30% training-test partition. According to the results, it was seen that texture features.
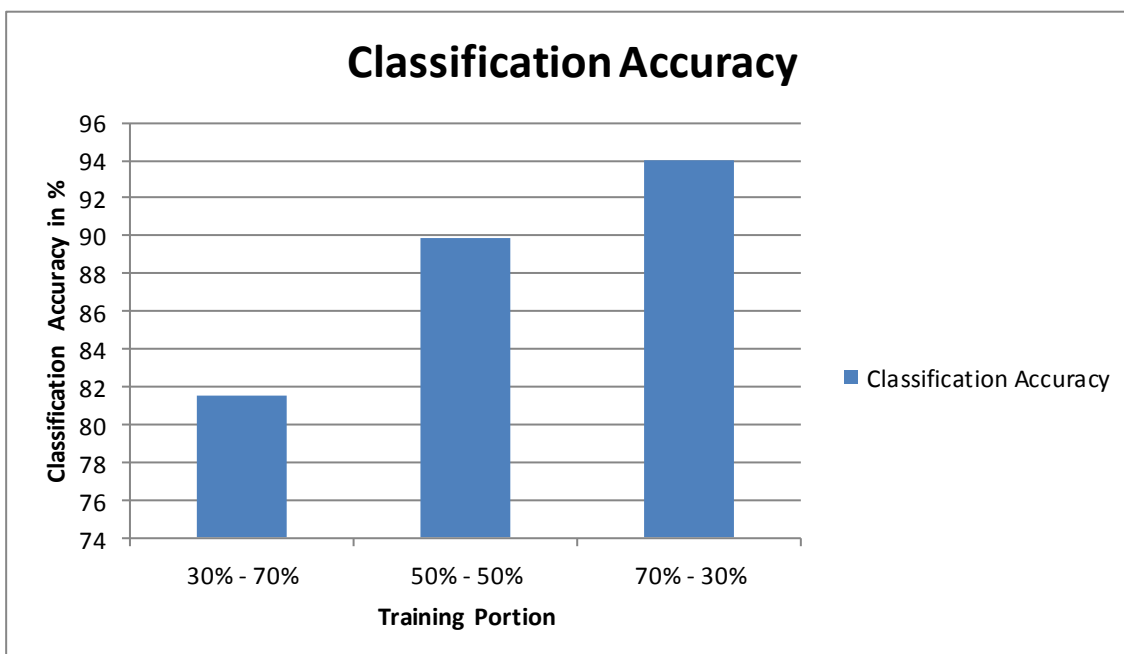
➢ **Experimental result in graph**

Fig 2-: Classification accuracy

Table-1- summarized result

Training Portion	Classification Accuracy
Table 1 30% - 70%	81.5
50% - 50%	89.9
70% - 30%	94

CONCLUSION AND FUTURE SCOPE

An effort is made towards recognition of face and the obtained recognition accuracy is much. This method will be very beneficial for finding missing person. This application will upload complaint on web server which can be accessed by any of the trust member having this application. This project Finding Missing Person using Face Detection on Android Application presents the solution for this problem. We are using four modules User, Police, Compliant holder, Admin for getting appropriate result.

Admin continuously Update database and Delete unnecessary data.

In future we intend to use more advanced safety measures like to check alcohol consumption, lane change detection, collision detection, traffic information, e-toll collection, license renewal etc. We also think of applying deep neural network techniques & make transportation more intelligent

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