**Helmet Detection and License Plate Recognition Using CNN**

ABSTRACT

Nowadays, road accidents are one of the major causes that leads to human death. Among them, motor bike accidents are common and causes critical injuries. Helmet is one of the main protection unit for a motor bicyclist. However, many fail to conform to the law of wearing helmet. Here, to detect the motorcyclists who are violating the helmet laws, a system using image processing and convolutional neural network is implemented. The system consist of motorbike detection , helmet vs no helmet classification and motorbike licence plate recognition. The motorbikes are detected using the feature vector HOG. Once the motorbike is detected, by means of convolutional neural network, it is determined whether the motorcyclist is wearing a helmet or not. If the motorcyclist is identified without helmet, then the license plate of the motorcycle is detected using tesseract OCR

**REQUIREMENT SPECIFICATION**

**Functional Requirements**

* Graphical User interface with the User.

**Software Requirements**

For developing the application the following are the Software Requirements:

1. Python
2. Django
3. Mysql
4. Wampserver

**Operating Systems supported**

1. Windows 7
2. Windows XP
3. Windows 8

**Technologies and Languages used to Develop**

1. Python

**Debugger and Emulator**

* Any Browser (Particularly Chrome)

**Hardware Requirements**

For developing the application the following are the Hardware Requirements:

* Processor: Pentium IV or higher
* RAM: 256 MB
* Space on Hard Disk: minimum 512MB

REFERENCES

[1]. .J.Chiverton, "Helmet presence classification with motorcycle detection and tracking," in IET Intelligent Transport Systems, vol. 6, no. 3, pp. 259-269, September 2012.

[2]. R. Silva, K. Aires, T. Santos, K. Abdala, R. Veras and A. Soares, "Automatic detection of motorcyclists without helmet," 2013 XXXIX Latin American Computing Conference (CLEI), Naiguata, 2013, pp. 1-7.

[3]. R. R. V. e. Silva, K. R. T. Aires and R. d. M. S. Veras, "Helmet Detection on Motorcyclists Using Image Descriptors and Classifiers," 2014 27th SIBGRAPI Conference on Graphics, Patterns and Images, Rio de Janeiro, 2014, pp. 141-148.

[4]. P. Doungmala and K. Klubsuwan, "Helmet Wearing Detection in Thailand Using Haar Like Feature and Circle Hough Transform on Image Processing," 2016 IEEE International Conference on Computer and Information Technology (CIT), Nadi, 2016, pp. 611-614.

[5]. K. Dahiya, D. Singh and C. K. Mohan, "Automatic detection of bike-riders without helmet using surveillance videos in real-time," 2016 International Joint Conference on Neural Networks (IJCNN), Vancouver, BC, 2016, pp. 3046-3051.

[6]. C. Vishnu, D. Singh, C. K. Mohan and S. Babu, "Detection of motorcyclists without helmet in videos using convolutional neural network," 2017 International Joint Conference on Neural Networks (IJCNN), Anchorage, AK, 2017, pp. 3036-3041.

[7]. B. V. Kakani, D. Gandhi and S. Jani, "Improved OCR based automatic vehicle number plate recognition using features trained neural network," 2017 8th International Conference on Computing, and Networking Technologies (ICCCNT), Delhi, 2017, pp. 1-6.

[8]. N. Dalal and B. Triggs, “Histograms of oriented gradients for human detection,” in 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR’05), vol. 1, June 2005, pp. 886– 893 vol. 1.