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Vehicle Classification and Detection

Mrs.Poonam Chavan, Shreyas Borse, Yash Badgujar, Rushikesh Bangar, Saurav Wankhade

Lecturer, Department Computer Engineering, Pimpri Chinchwad Polytechnic College, Nigdi, Pune, India

Student, Department Computer Engineering, Pimpri Chinchwad Polytechnic College, Nigdi, Pune, India

ABSTRACT: With the rapid development of intelligent video analysis, traffic monitoring has become a key technique for collecting information about traffic conditions. Using the traditional sensors such as loop detectors, ultrasonic sensors may cause damage to the road surface. Meanwhile, many of these sensors need to be installed in urban areas, the cost of this work is high. Surveillance video cameras are commonly used sensors in the traffic monitoring, which can provide video stream for vehicle detection and counting. Vehicle counting process provides appropriate information about traffic flow, vehicle crash occurrences and traffic during the peak times in roadways. An acceptable technique to achieve these goals is by using digital image processing methods on roadways. Our project describes the methodology used for image processing or video processing for traffic flow counting with real time videos using a programming language.

KEYWORDS :- Intelligent video analysis, Traffic monitoring, Vehicle counting, Digital image processing, Real-time.

I. INTRODUCTION

The traffic issue is a significant issue occurring in numerous urban areas in the world. There are numerous significant reasons for the traffic issue. The quantity of individuals moving into a metropolitan region has developed generously, prompting an emotional expansion in the quantity of vehicles. However, the street limit has become generally lethargic and get lacking. This causes an irregularity between the quantities of vehicles and streets, bringing about street gridlock, particularly in enormous urban areas. An insufficiency of public transportation frameworks likewise causes a similar issue. Vehicle detecting and counting have a significant influence in numerous system that helps to regulate and control traffic in urban areas. The fundamental goal is to detect and count moving vehicles with clear accuracy and to have the option to do as such on streets, highways and in little paths, etc. OpenCV-analysis and understanding of images and videos taken by an advanced camera-has acquired more approval and been utilized in numerous fields including industry, medication, robotics, and so on. Computer vision has likewise been applied for addressing traffic and transportation problems. For instance, a video sequence of streets can be handled and analyzed to identify and count vehicles. Additional data, Such as vehicle speed or traffic density, can likewise be determined by the help of a computer vision. This may directly help in two kind of peoples. Street users and traffic organizations. In the event that street users know the constant traffic data, they can utilize the data to pick the most ideal path for traveling and can keep away from congestion. Then again, traffic organizations can use the traffic data in their traffic control systems, bringing about better traffic to the board.

II. MODULE IDENTIFICATION

In existing, we need to maintain the Excel sheets, CSV etc. files for the user daily and monthly expenses. In existing, there is no as such complete solution to keep a track of its daily expenditure easily. To do so a personas to keep a log in a diary or in a computer, also all the calculations needs to be done by the user which may sometimes results in errors leading to losses

To reduce manual calculations, we propose an application. This application allows users to maintain a digital automated diary. Each user will be required to register on the system at registration time, the user will be provided id, which will be used to maintain the record of each unique user. Expense Tracker application which will keep a track of Income-Expense of a user on a day to day basis. The best organizations have a way of tracking and handling these reimbursements. This ideal practice guarantees that the expenses tracked are accurately and in a timely manner. From a company perspective, timely settlements of these expenses when tracked well will certainly boost employees' morale. Additional feature of Expense and income prediction helps to better budjet management.

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III. SCOPE

Daily Expense Tracker System is designed to keep a track of Income-Expense of an organisation on a day-to-day basis. This System divides the Income based on daily expenses. If exceed day's expense, system will calculate income and will provide new daily expense allowed amount. Daily expense tracking System will generate report at the end of month to show Income-Expense graph. And employees send reports to the manager for verification. Manager send final reports to administrator .Based on the final reports system predict the next month expense . It will helps to manage over all expense and income . Businesses utilize expense management software to process, pay, and audit employee-initiated expenses.

IV.EXISTING SYSTEM

The trouble of getting the initial background there is the mistake of continuous background update and the trouble of controlling the update speed in moving vehicle location of traffic video. And with the expanding number of streets and traffic everywhere on the world, traffic observing and control utilizing current advancements has become a convincing necessity. The Vehicle detection is the key task in this area and counting of a vehicle plays a important role and this two are important applications.

V.RELATED WORK

[1] Kyung-Soo Lim, Seoung-Hyeon Lee, Jong Wook Han, Geon-Woo Kim proposed some Design considerations for an intelligent video surveillance system using cloud computing. Deep neural network and cloud computing based intelligent video surveillance technology are growing interests in the industrial and academia. The synergy with both technologies emerges as a key role of the public safety and video surveillance in the field. Reflecting these trends, we have been studying a cloud-based intelligent video analytic service using deep learning technology. INCUVAS (cloud-based INCUbating platform for Video Analytic Service) is a platform that continuously enhances the video analysis performance by updating real-time dataset with the deep neural network on a cloud environment.

[2] Paawan Sharma, Mukul K Gupta, Amit K. Mondal, Vivek Kaundal proposed a HAAR like feature-based car key detection using cascade classifier which has paper reports of effective real-time implementation for specific object detection in an image or sequence of images. For the present work, car key has been taken as an object under consideration. The classifier is developed using OpenCV-Python. The procedure encompasses training and detection. A wide variety of object images are used for training purpose. The developed xml classifier is then tested on separate test images. The classifier has a good success rate with minimal false object detection rate.

[3] Qi Wang, Zhougyuan Wang and Jing Xiao proposed Fine-grained vehicle recognition in traffic surveillance. Finegrained vehicle recognition in traffic surveillance plays a crucial part in establishing intelligent transportation system. The major challenge lies in that differences among vehicle models are always subtle. In this paper, we propose a part-based method combining global and local feature for fine-grained vehicle recognition in traffic surveillance. Besides, we collect a comprehensive public database for 50 common vehicle models with manual annotation of parts, which is used to evaluate the proposed method and serves as supportive dataset for related work. The experiments show that the average recognition accuracy of our method can approach 92.3 %, which is 3.4 %–7.1 % higher than the state-of-art.

[4] Shaif Choudhury, Soummyo Priyo Chattopadhyay and Tapan Kumar Hazra proposed Vehicle detection and counting using haar feature-based classifier. In this paper we would describe a vehicle detection technique that can be used for traffic surveillance systems. An intelligent traffic surveillance system, equipped with electronic devices, works by communicating with moving vehicles about traffic conditions, monitor rules and regulations and avoid collision between cars. Therefore, the first step in this process is the detection of cars. The system uses Haar like features for vehicle detection, which is generally used for face detection. Haar feature-based cascade classifiers are an effective object detection method first proposed by Viola and Jones. It's a machine learning based technique which uses a set of positive and negative images.

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VI. PROPOSED SYSTEM

In this type of processing typically needs input data provided by the computer vision system and acting as a vision sensor and providing a high-level information. Then the video frames which are captured by the surveillance cameras are given as an input video for vehicle detection and counting. The advanced digital data infrastructure of deployed surveillance systems enables the development of automated video analysis tools that can be used for traffic surveillance, as well as identifying events and raising alarms in advance. The goal of a vehicle detection and classification system for traffic scenes is to guide surveillance operators and reduce the need for human resources. Observing hundreds of cameras in traffic surveillance can reduce the rate of road accidents for drivers while also increasing the success rate of driverless cars. The main challenge of surveillance is the scarcity of human resources to monitor hundreds of cameras. In this study per frame vehicle detection and classification will be performed using 3D models that will make use of deep learning. A learning approach and the use of a CNN network are proposed. To extract motion silhouettes from a video frame, the detector will use background estimation. The classifier will use 3D wire frame models and CNN to determine the appropriate class label for each silhouette. In these deep neural network tests, S-sharp functions are chosen as activation functions in hidden layers, and the well-known backpropagation algorithm is used in the training process

VII.RESULTS/OUTPUTS

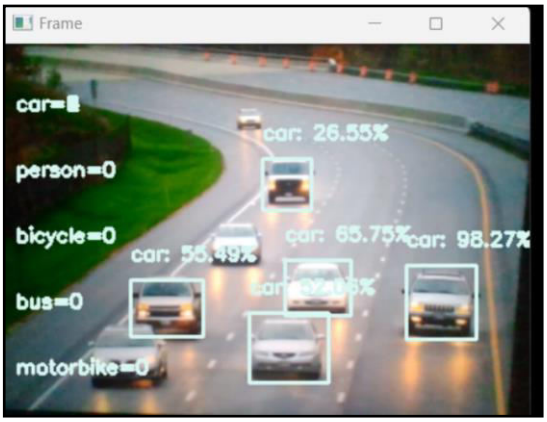

Fig-7.1 Car Detection

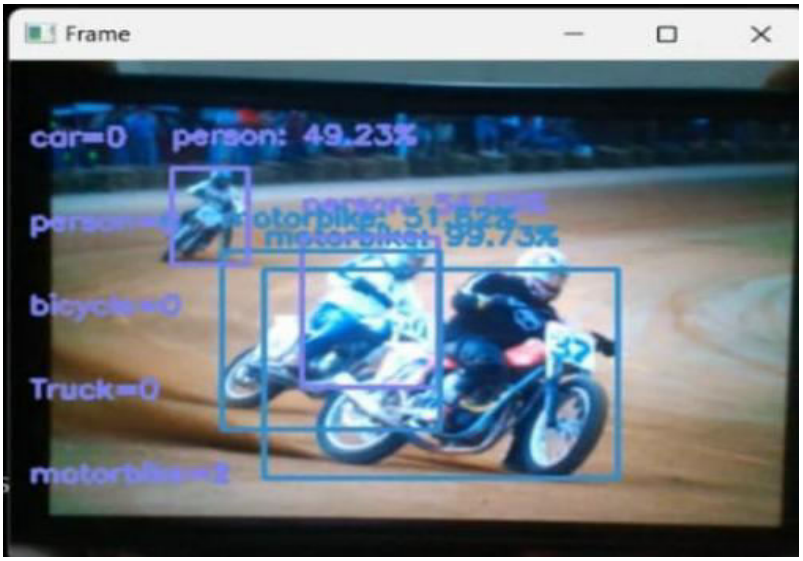

Fig-7.2 Motor Bike detection

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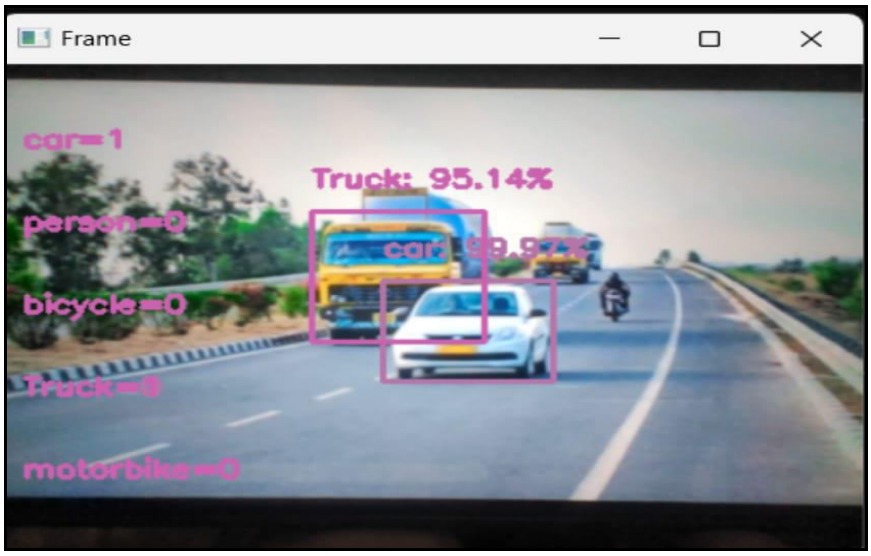

Fig-7.3 Truck and Car Detection

Fig-7.4 Car Detection

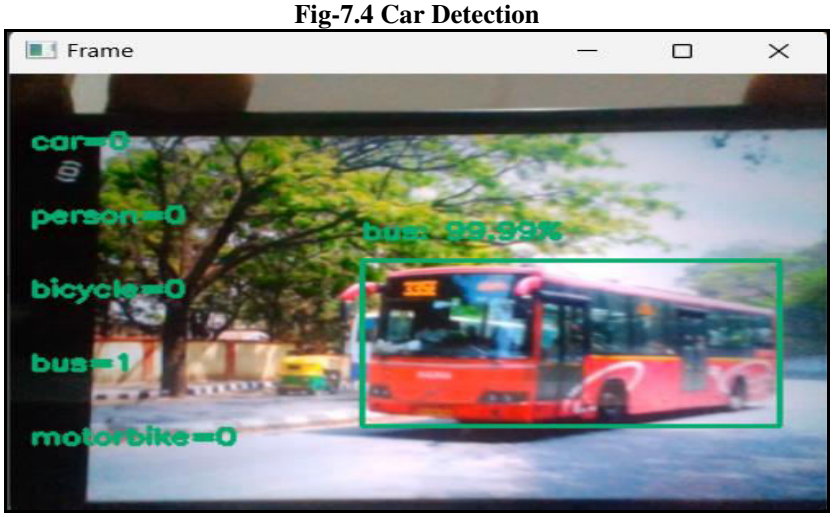

Fig-7.5 Bus Identification

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VIII. CONCLUSION

This single project produces multi domain outputs. It can count and classify vehicles on highways by the methods mentioned above and help with highway management and toll collection, it can calculate traffic density on busy traffic roads for better monitoring. Some more work is needed in reducing the occlusions present in the image.

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[6] “HAAR like feature-based car key detection using cascade classifier” in the year 2017.

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