Vehicle Recognition and Counting

Prahlad Kumar
CSE BRANCH, 2nd Semester
IIIT Naya Raipur
Naya Raipur, India
k.prahlad101@gmail.com

Pratik Gupta
CSE BRANCH, 2nd Semester
IIIT Naya Raipur
Naya Raipur, India
prateek.pratik.gupta@gmail.com

Pankaj Verma
CSE BRANCH, 2nd Semester
IIIT Naya Raipur
Naya Raipur, India
Pankaj1411@gmail.com

Ayush Kumar Batwada
CSE BRANCH, 2nd Semester
IIIT Naya Raipur
Naya Raipur, India
ayushbatwada@gmail.com

Bhuneshwar Singh Netam
CSE BRANCH,2nd Semester
IIIT Naya Raipur
Naya Raipur, India

Abstract— nowadays in big cities across the world, the vehicle drivers of different vehicles cheat the organization by bribing them the amount of goods transported and then stealing some amount of goods from the warehouse. This is one of the major issues faced by the organizations across the world. This is a threat to both the big and small industries. For big industries, these small damages sum up to a big total while in case of small and under developing organization it creates problem in their growth and slows down their progress. Present solution to this problem involves security measures like CCTV cameras.

The proposed system keeps a track of the vehicle being coming and leaving the warehouse by using a camera. The proposed system takes around 3 seconds per image to count vehicles for proper management of the importation of goods. Experimental results demonstrated that the proposed system can provide significant improvements on the detection accuracy. In addition, experiments on challenging videos with occlusions or full of vehicles show that the proposed system works effectively.

Keywords—**vehicle detection, video analysis,**
background estimation

I. INTRODUCTION

Stealing of goods from organization via reporting an amount to the organization which is much greater than the actual import is a big challenge to the developed and under developing industries. The requirement to detect and count the moving vehicle is getting very important for the growth of these industries across the world. The vehicle detections can be traditionally achieved
through inductive loop detector, infrared detector, radar detector or video-based solution. The video-based solutions based on surveillance camera mounted outdoor are easily influenced by environments such as weather, illumination, shadow, etc.
However, because video-based systems can offer several advantages over other methods such as traffic flow undisturbed, easily installed, conveniently modified, etc., they have drawn significant attention from researchers in the past decade.

Intelligent transportation systems (ITS), applied to collect, cognize, and manage information about transportation flows from various sources, are emerging worldwide to make import-export facilities more efficient, reliable, cleaner and safer. A traditional computer vision method for moving objet detection in video-based system is so-called "background subtraction", or computing the difference between a background model and current frame, which demands to estimate a robust background to deal with the changing object. For this reason, in the case of vehicle detection on road, an

adaptive rather than static background is needed for real-time road situations.

## II. SYSTEM DESIGN (E.G. SMART ROOM, SMART DUSTBIN..)
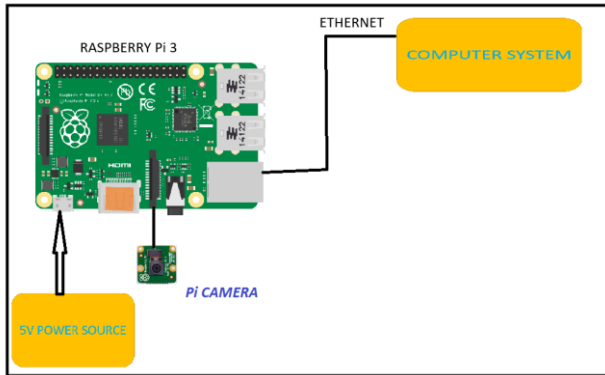
A. Block disgram

B. Hardware and Sensor

Rasberry Pi: The Raspberry Pi board used in the proposed system is RPi 3 which having following features:

- 5V@1A maximum power from an adaptor.
- 700 MHz ARM1176JZF-S core (ARM11 family, ARMv6 instruction set).
- 1.2 GHz operating speed.
- 1 GB RAM
- 4 USB ports for Key board mouse or accessing external memory.
- 40 GPIO pins.

III. EXPERIMENTAL PROTOTYPE

- The project consists of raspberry pi connected with a pi cam which contains a program to recognize vehicles.
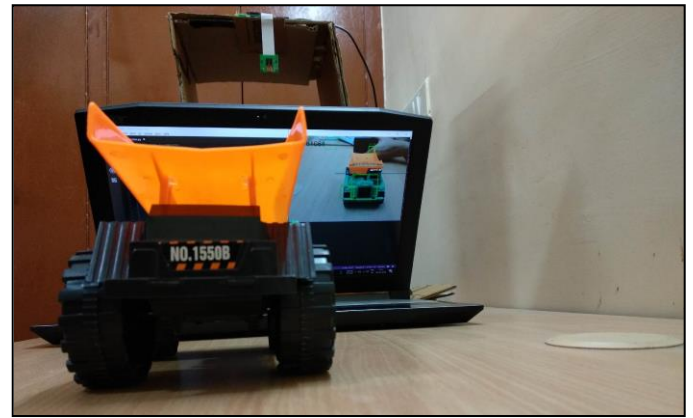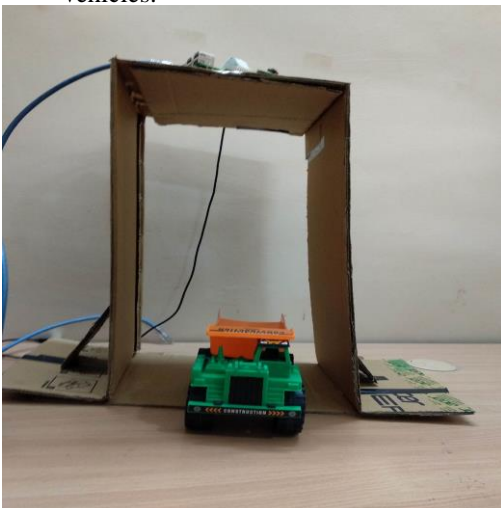
- Software part of the project has been implemented using python and OpenCV. OpenCV's cascade classifier is a tool which is used to identify objects present on a frame. This tool is effectively used in the project

- The project is very useful for detecting the goods vehicle and managing them. It can be used to count the number of vehicles entering and leaving, thus providing security.

- The current project can have a lot of improvements as its accuracy is not very good and sometimes it it recognizes false things as vehicles.

IV. CONCLUSION

Due to increasing demands in ITS, there is a huge amount of potential applications of detecting, tracking, and counting the moving vehicles from the warehouse of the companies. We present a system to detect and count the number of vehicles entering and leaving the warehouse.
Our project uses OpenCV library of Raspberry Pi for image processing and Python programming language for detection of vehicles' movement and counting according to the movement of vehicle by testing whether the vehicle is entering or leaving warehouse. Whether a vehicle is entering or leaving the warehouse is figured out using the changing size of the vehicle.

ACKNOWLEDGMENT

REFERENCES

1) https://ieeexplore.ieee.org/abstract/document/7282250/
2) https://ieeexplore.ieee.org/document/7159414/
3) https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnu mber =7727480&tag=1