# VEHICLE COUNT MODEL USING COMPUTER VISION

A PROJECT REPORT

Submited by

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To

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# DECLARATION

I undersigned hereby declare that the project report “VEHICLE COUNT MODEL USING COMPUTER VISION” , submitted for task completion of I clear private limited, is a work done by me. This submission represents my ideas in my own words and where ideas or words of others have been included; I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the company and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained.

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# ABSTRACT

Intelligent vehicle detection and counting are becoming increasingly important in the field of highway management. However, due to the different sizes of vehicles, their detection remains a challenge that directly affects the accuracy of vehicle counts. In this project vehicle counting model is created by using open cv. At this system I detect the vehicle passed in a frame, then count the vehicle that are passed in single frame, and displayed on the screen. This project is divided into 3 part, they are video reading, car detection and counting. In video reading part, read the file and save into frames. In car detection, detecting cars from frames with the help of car cascade xml files. The counter will count the vehicle they are passed the line. This counted data can displayed on the screen.

# INTRODUCTION

We are witnessing today an increasing use of digital images due to the evolution of computational power, and the low cost of extremely efficient digital cameras. Image Processing and Motion Analysis in videos proved to be an indispensable tool for diverse applications as video surveillance, medical imaging, robotics, human-machine interaction, the analysis of sports video sequences, road and highway traffic monitoring.. The latter was a subject of study and important debate for public authorities around the world.

Under the flag of Intelligent Transportation System (ITS), researchers are trying to apply 21st century intelligence to achieve manifold and noble goals including safety, efficiency, environmental preservation by reducing vehicle emissions etc. One of these genuine software is video based vehicle counting, which is the project presented in this report.

Actually, the data collected from traffic volume analysis is used by local governments to estimate road usage, volume trends, peak time periods, optimal traffic enforcement time periods, as well as optimal maintenance schedules. Real-time traffic flow data can also help home-land security agencies to efficient incident management, which consists of incident detection, verification, and intervention.

In this report, I describe a computer vision system used for counting vehicles moving on roads. The system involves analyzing a sequence of road images which represent the flow of traffic for the given time period and place.

# TASK OVER VIEW

## PROJECT PRESENTATION

Our roads are suffering more than ever from traffic congestion due to the rising number of vehicles and the increasing number of adults who want to have their own personal transport. Due to this problem also polices and other traffic controllers suffering more problem so that this project helps to count and detect the vehicle passed thought the area.

## PROJECT DISCRIPTION

I have been assigned the task of designing and developing a first prototype of an automated vehicle counting software for traffic surveillance.

We had to make the following assumptions in the first step:

1- Camera is stationary
2- Four wheels are taken as vehicle

## REQUIREMENTS

Functional Requirements :

As it's the first prototype of the system, our main goal is to realize the core of the application, the vehicle counting module. We should be able to process any traffic surveillance video meeting our requirement, i.e. in terms of frame resolution and recording angle, and get the best possible vehicle counting. We should also be able to measure the accuracy of the system using associated metrics in order to validate our counting results.

Nonfunctional Requirements :

For the nonfunctional requirements we decided to focus on the following aspects :

• Portability : Code should be run on a computer or embedded on the surveillance camera

• Maintainability : the application should be easy to extend

• Reliability: The system should be more than 80% accurate

CHALLENGES

Although there has been interest in object detection and tracking during the past two decades, many difficulties still remain a serious concern for the performance of this process. For the former we can mention

- Noise in image : due to a poor quality image source such as images acquired by low resolution cam or images after compression
- Camera movement
- Illumination change : Gradual (day light) or sudden (light switch indoor)
- Changing appearance patterns of both the object and the scene
- Non-rigid object structures

# IMPLIMENTATION

## INSTALLING AND IMPLIMENTATION OF PYTHON AND openCV

The first step in implementing the Vehicle counting system was installing OpenCV library. But just before, we have to install a dozen of required libraries to our Unix environment. I've worked at first with the version PYTHON 3 since it's the last stable one. It contained more features and it was a requirement for the background subtraction algorithm we are using.

## DETECTING THE CARS

By using the features of car contained files CAR.xml applied to find the cars and a rectangle applied on the all vehicle that I seen. Hear they detect the car on the basis of some data contained on the file so that we can easily find the moving vehicle and property included object.

### COUNTING IMPLIMENTATION

I implemented simple counting system that compare the line of I taken so that it check if the line passed the line I drawn on the video so that it check and calculate the value and continuously shown on the screen.

# CONCLUTION

Throughout this report, I detailed the adopted design for the automatic vehicles counting system solution to finish with the system implementation and a measurement of the obtained results.

A traffic flow estimation system is far more complex than what I accomplished, but I have succeeded to build the most important piece, the key module of a large system. As for the perspectives I suggest

- Improving the car detection cascade file
- Improving the counting and comparison methods
- Improve the quality of video recorder