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Vehicle Type Identification

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***Abstract* - Vehicle detection system is identify the vehicle type with the help of image take by camera. This system is design for identify the threat vehicle entering in particular premises . Domain used for this system is image processing which analyse the image and distinguish the vehicle on the basis of its height, no of vehicle and its width etc. A previous implementation of vehicle detection is done by using its magnetic field and using its a devices called by magnetometer**

Key Words: Morphology transformation , image processing , color detection, point transformation, Data Analysis.

I. INTRODUCTION

Image processing plays an important role in various real time applications ranging from medical imaging to pattern and object recognition for different purposes. One such application is object detection of mobile targets in a particular environment. Vehicle detection on roads is an example of such object detection which is used for traffic analysis, monitor and control. Hence, an initial step for traffic controlling is vehicle detection and classification using traffic measuring techniques. Image processing based techniques are one of the most widely used techniques which achieve this objective.

A. Problem Statement

The running generation of world , vehicle are the basic need of a person of travelling from one place to another place. Vehicle which can be a consider as a threat to the surrounding must be detected . This detection system can be not only use by the critical areas but also traffic controllling in future scope.

B. Literature Survey

Image processing is an important part of the artificial intelligence that is used for interpret the environment. Before using information about environment data must be passed through different processes to interpret by artificial intelligence. In general those steps are gathering data (image, video etc.), analyzing it and converting to different form that can be understand by the computer interpretation.

The number of surveillance systems has increased in recent years thanks to advances in hardware and lower production costs and video cameras in these systems have very high resolution. With this, increased video sources produce surprising amounts of data which must be reviewed and interpreted but the amount of data is too large to be examined by human operators. As a result, researchers are more likely to take advantage of technology such as Intelligent Transportation System (ITS).

Vehicle classification is a crucial step for traffic management software. Knowing the model and brand of a vehicle is desirable because it allows queries when a particular vehicle is investigated such as "when did the x vehicle pass this way or where did it go?". Due to all these reasons vehicle classification has a wide range of applications such as traffic flow control like vehicle count, vehicle type detection, vehicle trajectory and intelligent parking systems

Object detection and classification are two important image processing tasks. Each object has its own unique features. While the object detection provides information about localization of the object, object classification provides information about which category the object belongs to. Object classification is a technology based on the field of image processing of computer science and is the process of finding specific real-world objects such as faces], buildings and vehicles etc.

C. Methodology

Python: Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed. Often, programmers fall in love with Python because of the increased productivity it provides. Since there is no compilation step, the edit-test-debug cycle is incredibly fast. Debugging Python programs is easy: a bug or bad input will never cause a segmentation fault. Instead, when the interpreter discovers an error, it raises an exception.

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***OpenCV*:** OpenCV was started at Intel in 1999 by Gary Bradsky and the first release came out in 2000. Vadim Pisarevsky joined Gary Bradsky to manage Intel's Russian software OpenCV team. In 2005, OpenCV was used on Stanley, the vehicle who won 2005 DARPA Grand Challenge. Later its active development continued under the support of Willow Garage, with Gary Bradsky and Vadim Pisarevsky leading the project. Right now, OpenCV supports a lot of algorithms related to Computer Vision and Machine Learning and it is expanding day-by-day.

II. EXISTING SYSTEM

The existing system use magnetometer for vehicle detection. Magnetometers can be either wired or wireless, but for the purposes of this article we will focus on wireless magnetometers, which offer important advantages to the end user.

A magnetometer works by using a passive sensing technology to detect large ferrous objects (for example, a truck, automobile, or rail car) by measuring the change in the ambient magnetic field. When a vehicle alters that magnetic field, the sensor detects those changes. As with other sensors, the range of the magnetometer will depend on the target. The ability to reliably detect vehicles offers significant advantages for asset management, resource allocation, site safety and traffic control. Identifying the right technology for your vehicle detection application can be challenging, and many factors must be taken into consideration, including task, size of target, sensing range, sensor mounting, and whether the application is primarily indoor or outdoor.

Magnetic sensors have been in use for well over 2,000 years. Early applications were for direction finding, or navigation. Today, magnetic sensors are still a primary means of navigation but many more uses have evolved. The technology for sensing magnetic fields has also evolved driven by the need for improved sensitivity, smaller size, and compatibility with electronic systems. An integrated circuit based magnetic sensor, optimized for use within the earth's magnetic field, will be presented—anisotropic magnetoresistive (AMR) sensors. Applications using AMR magnetic sensors are emphasized.

Vehicle Detection The earth's field provides a uniform magnetic field over a wide area—say several kilometers2 . Figure 4 shows how a ferrous object, a car, creates a local disturbance in this field whether it is moving or standing still. AMR magnetic sensors can detect the change in the earth's field due to the vehicle disturbance for many types of applications.

Applications for vehicle detection can take several forms. A single axis sensor can detect when a vehicle is present, or not. The sensing distance from the vehicle can extend up to 15 meters away depending on its ferrous content. This is useful in parking garages to give drivers entering it a choice of where the most available spaces to park. Another use is to detect approaching trains to control the crossing gates. In this application, two sensors could be used to detect presence, direction of travel, and speed to give the controller enough information to control the crossing gates. The magnetic disturbance of a large ferrous object, such as a car, can be modeled as a composite of many dipole magnets. These dipoles have north-south orientations that cause distortions in the earth's magnetic field.

III. IMPLEMENTATION PLAN

An implementation methodology is a collection of practices, procedures and rules that must be applied to perform a specific operation to provide deliverables at the end of each stage. The eight principles listed below is built from a collection of procedures to establish an effective implementation methodology framework. This framework provides flexibility to react and adapt to the unique requirements of every project, incorporating the principles of:

1. Project Management & Planning
2. Scope & Requirements Specification
3. Risk & Issues Management
4. Communication & Training
5. Quality Management
6. Post-Implementation Review
7. Documentation G
8. Experience

IV. SYSTEM ARCHITECTURE

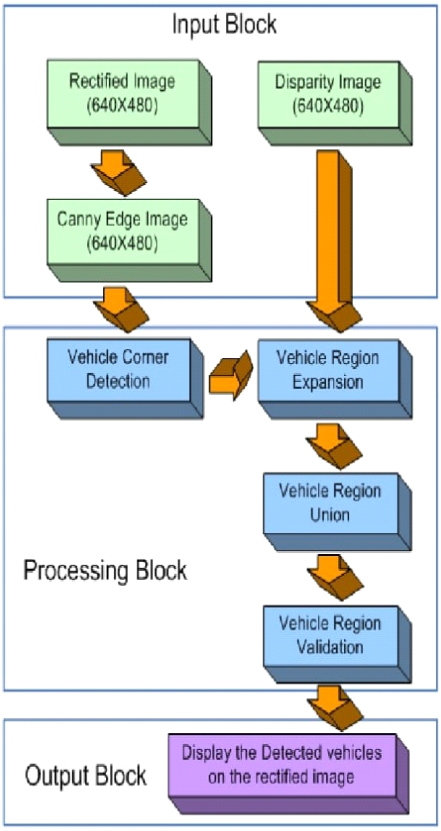

Fig. 1 Block diagram of vehicle detection

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V.CONCLUSION

Vehicle detection uses image processing to detect vehicles. Here image is captured by a camera connected to Rasberry Pi programmed in Python using OpenCV library Image processing basically means performing processes on an image with the help of software. The goal of applying processes like smoothing, sharpening, contrasting, stretching etc on an image can be to increase its readability or to enhance its quality or even transform the image.

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