Minor Project Report

on

VEHICLE NUMBER PLATE DETECTOR

Submitted in partial fulfillment of the requirements for the award of degree of

Bachelor of Technology

in

Computer Engineering

by

DHRUV
19001003039
ASHISH
19001003022

Under supervision of

DR KOMAL BHATIA

Department of Computer Engineering

J. C. BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA
FARIDABAD-121006

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CANDIDATE'S DECLARATION

I hereby certify that the work which is being carried out in this Minor Project titled VEHICLE NUMBER PLATE DETECTION

in fulfillment of the requirement for the degree of Bachelor of Technology in Computer Engineering and submitted to "**J. C. Bose University of Science and Technology, YMCA, Faridabad**", is an authentic record of my own work carried out under the supervision of DR Komal Bhatia Sir

The work contained in this thesis has not been submitted to any other University or Institute for the award of any other degree or diploma by me.

DHRUV

19001003039

ASHISH

19001003022

CERTIFICATE

This is to certify that the work carried out in this project titled **Vehicle Number Plate Detection** submitted by Dhruv and Ashish to "**J. C. Bose University of Science and Technology, YMCA, Faridabad**" for the award of the degree of Bachelor of Technology in Computer Engineering/Information Technology is a record of bonafide work carried out by his under my supervision. In my opinion, the submitted report has reached the standards of fulfilling the requirements of the regulations to the degree

Dr komal Bhatia sir
(Supervisor)
Assistant Professor,
Department of Computer Engg,
J. C. Bose University of Science and Technology, YMCA, Faridabad

Dr. Komal Kumar Bhatia
Chairman,
Department of Computer Engg,
J. C. Bose University of Science and Technology, YMCA, Faridabad

ACKNOWLEDGEMENT

We had a great experience working on this project and we got to learn about new skills through this project. However, it would not have been possible without a kind support and help of many individuals. We would like to extend our sincere thanks to all of them. We are highly indebted to the teacher and especially Dr Komal Bhatia for their guidance and constant supervision as well as providing necessary information regarding the project and also for their support in completing the project.

ABSTRACT

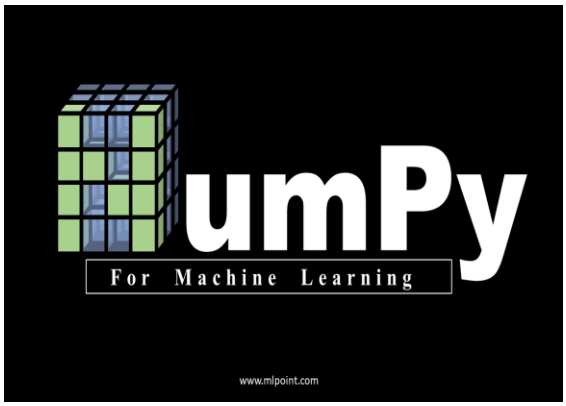
The project aims to develop a software which helps in detecting the number plate of any vehicle . It has been designed to provide a user friendly interface for carrying out a variety of tasks by employing certain well defined commands or using keyboard input

PROBLEM STATEMENT

The system of vehicle number plate detection and recognition is used to **detect the plates** then make the recognition of the plate that is to extract the text from an image and all that thanks to the calculation modules that use location algorithms, segmentation plate and character recognition

Purpose It is a technology that uses optical character recognition on images to read vehicle registration plates to create vehicle location data. It can use existing closed-circuit television, road-rule enforcement cameras, or cameras specifically designed for the task. ANPR is used by police forces around the world for law enforcement purposes, including to check if a vehicle is registered or licensed. It is also used for electronic toll collection on pay-per-use roads and as a method of cataloguing the movements of traffic, for example by highways agencies.

Numpy



NumPy library is an important foundational tool for studying Machine Learning. Many of its functions are very useful for performing any mathematical or scientific calculation. As it is known that mathematics is the foundation of machine learning, most of the mathematical tasks can be performed using NumPy.

Pandas

pandas is a software library written for the Python programming language for data manipulation and analysis. In particular, it offers data structures and operations for manipulating numerical tables and time series. It is free software released under the three-clause BSD license.[2] The name is derived from the term "panel data", an econometrics term for data sets that include observations over multiple time periods for the same individuals.[3] Its name is a play on the phrase "Python data analysis" itself.[4] Wes McKinney started building what would become pandas at AQR Capital while he was a researcher there from 2007 to 2010.[5]

Tensorflow

TensorFlow is a free and open-source software library for machine learning. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks. Tensorflow is a symbolic math library based on dataflow and differentiable programming.

Pynumpy

NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

Matplot Library

Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python.

screenshotsscreenshotsscreenshotsscreenshots

Matplotlib makes easy things easy and hard things possible.

Create

Develop publication quality plots with just a few lines of code

Use interactive figures that can zoom, pan, update...

Customize

Take full control of line styles, font properties, axes properties...

Export and embed to a number of file formats and interactive environments

Extend

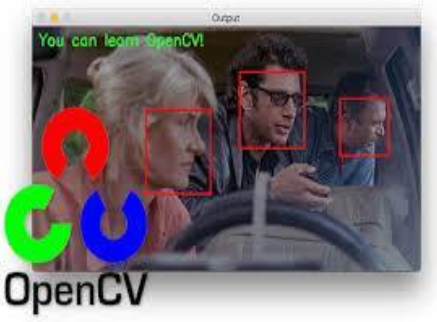
Explore tailored functionality provided by third party packages

Learn more about Matplotlib through the many external learning resources

Pytesseract

Pytesseract is a Python package that works with tesseract, which is a command-line optical character recognition (OCR) program. It's a super cool package that can read the text contained in pictures. Let's get to it.

OpenCV



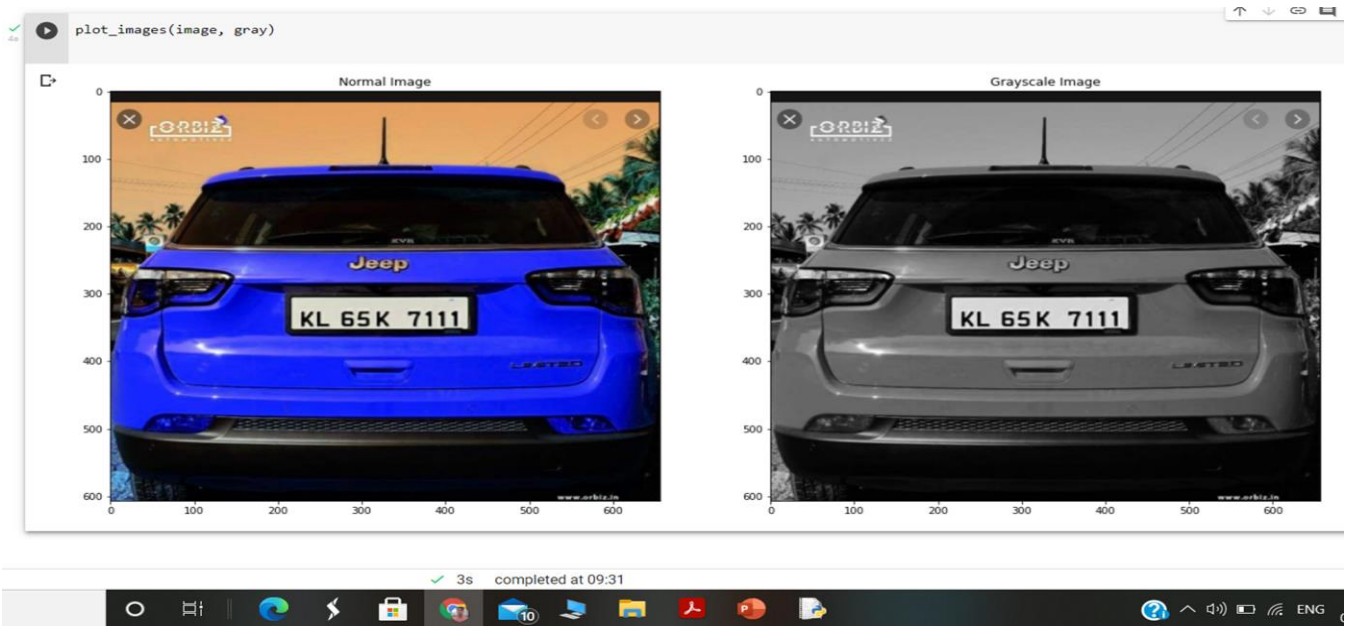
OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. Being a BSD-licensed product, OpenCV makes it easy for businesses to utilize and modify the code.

The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-the-art computer vision and machine learning algorithms.

Functional requirements and implementation

1) Convert The Image Into GrayScale Image

Converting into grayscale image speeds up the other process which is implemented in our project later because after removing color we do not have to deal with the color details when we processing an image



2) Using a bilateral filter

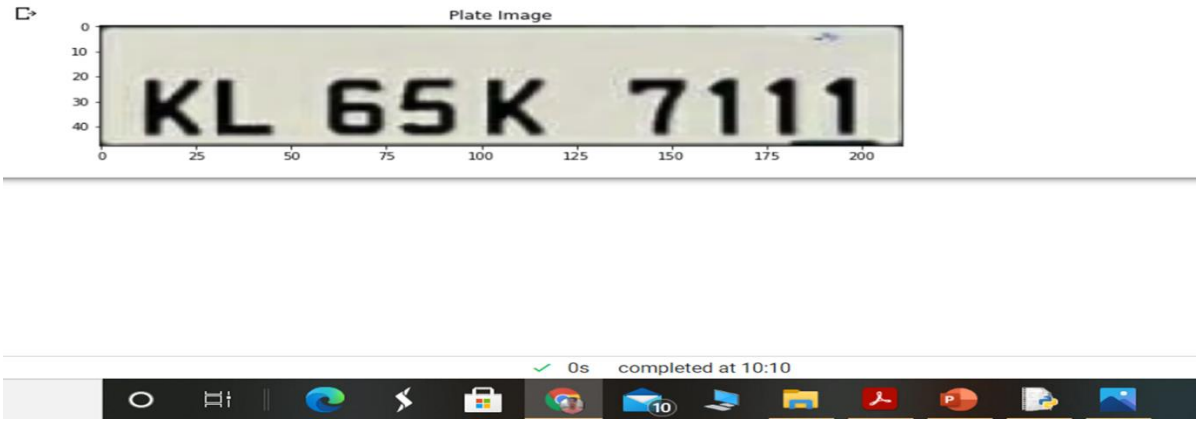
In our project we use the bilateral filter which helps to remove the unwanted detail of the image. By using this our project later on focus only useful regions

3) Edge detection

4) Contour detection

5) Sorted top 10 contours

6) Final plate detection



CONCLUSION

There is an immediate need of such kind of Automatic Number Plate Recognition System in India as there are problems of traffic, stealing cars etc.

Government should take some interest in developing this system as this system is very economical and eco-friendly,if applied effectively.

This change will help in the progress of the Nation.