

'WATCH BOT'



Version 1.0

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INTRODUCTION



ARTIFICIAL INTELLIGENCE

AI (artificial intelligence) is a branch of computer science which deals with intelligence demonstrated by machines in contrast to the natural intelligence displayed by human

PYTHON

Python is a programming language which has surfaced as a dominant language in AI and ML programming because of its simplicity and flexibility as well as its greater support for open source libraries such as keras, pandas, numpy, tensorflow, tesseract

OBJECTIVES

Detecting a number plate of a car for various purposes.

Our main objective is to automatic license plate recognition could be used to automatically open a gate or barrier into a secured area for authorized members. This could replace or assist security guards at the gates or barriers of premises

01

Object Detection

02

Passing input

03

Gray scale the image

04

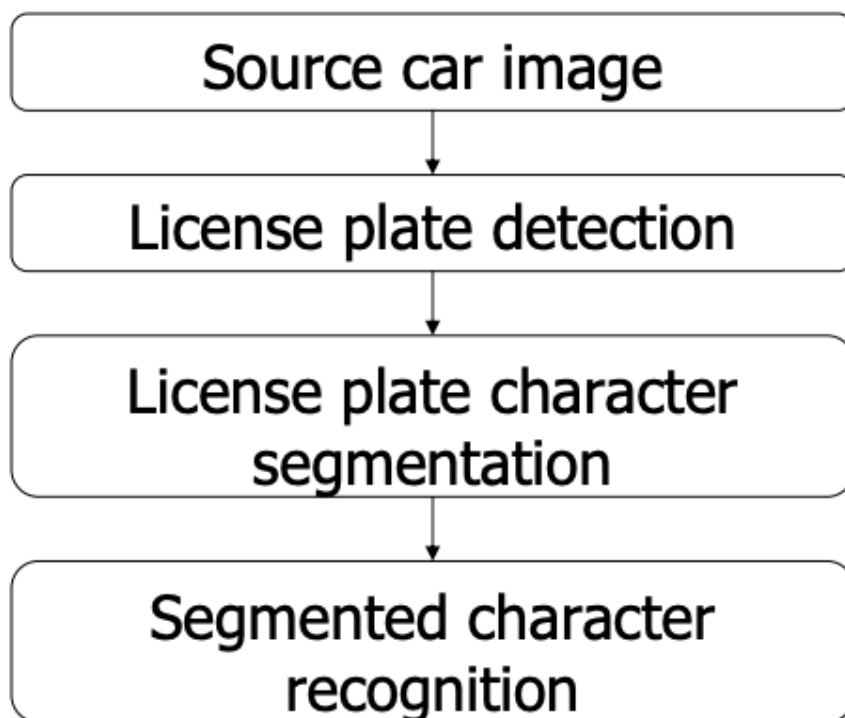
Detect Number Plate

05

Print the characters and



PROBLEM STATEMENT



REVIEW OF LITERATURE

A photograph showing the rear of an orange car, likely a BMW, on a road. The car is centered in the frame, and the background shows a blurred road and trees. The image is used as a background for the title section.

THESIS

We used YOLO(You look only once) for the help of object detection. YOLO trains on full images and directly optimizes detection performance. We used a predefined data set called Resnet-Coco(Common objects in context).

- We later pass a car image or a video to get the car image. We grayscale the image. Grayscale removes all color information, leaving only the luminance of each pixel. Afterwards we threshold the image.
- Afterwards we read each image character in the number plate and convert each character to a binary image. The 2D array of each image is flattened because the machine learning classifier requires that each sample is a 1D array therefore the 20×20 image becomes 1×400 . Image thresholding is a simple, yet effective, way of partitioning an image into a foreground and background. This image analysis technique is a type of image segmentation that isolates objects by converting grayscale images into binary images.
- We then invert the image by converting it into a numpy array.
- The invert was done so as to convert the black pixel to white pixel and vice versa. The next two steps are based on the assumptions that the width of a license plate should be between 5% and 15% of the license plate, and height should be between 35% and 60%.

DATA ANALYSIS & DATA MODELING



We have used YOLO for object detection which has been widely used before. We did find a few articles on the net at towardsdatascience.com and few of the ideas is based on the ANPR (Automatic number plate recognition) system.

PROJECT IMPLEMENTATION



CONCLUSION

We have successfully created a number plate detection system.