Licence plate identification

# Introduction

The license plate identification is a program that uses the main camera connected to the raspberry pi 5 that is used to capture, modify, then read the licence plates of cars. This feature is made to identify the car that is needed to moved/parked, without any outside interaction other than the request itself.

# Functions

There are four main functions that is needed to be performed for the identification to happen successfully. For almost all functions a library was used that was made to carry out these functions, with as little problems as possible

## Licence plate tracking

For detecting and tracking the licence plate a library called YOLOv3 (You Only Look Once v3) is used that was created to detect and identify different objects that enter the cameras sight. It has many pre-trained functions that can be loaded to detect almost anything and has many variations depending on what it is needed for

## Frame modification

The library that takes care of capturing images and modifying them is called OpenCV. This library is made for the application of Computer Vision which is about getting images and helping the computer in understanding them, so they can be used for different uses.

## Reading from pictures

EasyOCR in a way a simple program that was made to read text from images. EasyOCR is usually used with picture modification libraries, because even though it can read text from untouched images, these libraries can convert the frame into an another one where the text is possibly easier to read making the text reading much more reliable.

## Compare licence numbers

The last step of this code is about comparing the read licence numbers with the one that was requested. Whenever the reading was successful with high enough confidence then that set of numbers and letters gets compared to an already saved or a given numbers and letters and if the comparison was successful the lifting process begins. This step can be made without any significant libraries.

# Explanation of the code

The code starts with loading all the libraries and its dependencies and initialises the system. Then a loop starts going that captures the frames of the camera and looks for any licence plates.

When a licence plate was detected, the frame modification begins with the picture turning grey and get thresholded where if a pixel’s scale is above a give threshold, it becomes black and it its below, it becomes white, resulting in a black and white picture.

The black and white picture, if done well the text is read from it and then compared to a known licence number. When the comparison results in a failure the program starts looking for another car, but if it was correct then the position correction and lifting procedures begins.

# Conclusion

This program helps with the identification of the car that is needed to be lifted and parked/moved. Right know the code is in working order, but there is a limitation with the distance, where it can detect the licence plate from