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Final Project Proposal

Identification for license plates

The problem:

Our objective is to develop a Matlab program which can do license plate recognition by using computer vision, and neural network techniques [3]. With the development of society, more and more vehicles are on the roads, which caused traffic cognition in many Metropolis. According to [2], in 1990, Intelligent Transport System (ITS) was developed in the U.S. to solve this problem effectively. Moreover, license plate recognition (LPR) is an important component of it. It has been widely used in most public infrastructures such as public parking, catching escaped criminals, and identifies unregistered and stolen vehicles, and identifies unregistered and stolen vehicles etc,. For example, usually in public parkings, there are cameras which can automatically recognize the license plates. And then, it will calculate how long the car has parked and ask the driver to pay the parking fee at the exit. Therefore, with this kind of technique, a lot of human resources have been saved, which is the most important advantage of this program.

Approaches:

Generally, the project will be four parts:

1. Process the image to a level that is easier to detect and crop:
   We need to use methods, such as image grayscale, image enhancement, to process the image so that we could identify each character better[1].
2. Locate the plate from the image using the idea of mathematical morphology.
3. Crop the image and separate the letters and characters:
   Crop the image to show only the characters, which helps us not disturbing by other parts of the license plate. Using edge detection techniques to separate each of these characters so that we could do the comparison.
4. Compare the characters to the database:
   We have to build templates of all the letters and numbers. Then compare the characters with them.

Expected outcomes:

The Matlab program would read a license plate image as input and correctly return the same license plate number as output. It is supposed to recognize the alphabet of all 26 letters and numbers 0-9 and recognize the other characters as special characters. The figures below demonstrate an example of the input and output.

License Plate Image

Region of Interest

License Plate Number: **CK3~H547**

Bibliography:

[1] X. Zhang, F. Xu, and Y. Su, “Research on the License Plate Recognition based on MATLAB,” *Procedia Engineering, vol. 15, pp. 1330–1334, 2011.*

[2] Z. Zhang and C. Wang, “The Research of Vehicle Plate Recognition Technical Based on BP Neural Network,” *AASRI Procedia, vol. 1, pp. 74–81, 2012.*

[3] V. Koval, V. Turchenko, V. Kochan, A. Sachenko, and G. Markowsky, “Smart license plate recognition system based on image processing using neural network,” *Second IEEE International Workshop on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications, 2003.*