VEHICLE RECOGNITION USING OPTICAL CHARACTER READER

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ABSTRACT

In this paper, the evaluation of the performance of Vehicle Recognition System is being carried out using optical character recognition and Google vision. The vehicle recognition system identifies characters on the number plate using optical character recognition which is based on artificial intelligence domain.

Inspired by the need for real-time vehicle recognition for applications such as amber alerts, this study proposes a method of implementing signal processing and computer vision to accurately extract the license plate information of a vehicle in a photo. The method uses a series of filters to isolate specific characteristics of the vehicle. License plate detection was achieved with a 62.5% success rate.

Widely used as a form of information entry from printed paper data records – whether passport documents, invoices, bank statements, computerized receipts, business cards, mail, printouts of static-data, or any suitable documentation – it is a common method of digitizing printed texts so that they can be electronically edited, searched, stored more compactly, displayed on-line, and used in machine processes such as cognitive computing, machine translation, (extracted) text-to-speech, key data and text mining. OCR is a field of research in pattern recognition, artificial intelligence and computer vision.

Keywords —Optical Character Reader, Face Recognition, Image Processing

1. INTRODUCTION

Inspired by the real time need for vehicle recognition for many applications, this study proposes a method of implementing signal processing and computer vision to accurately extract the license plate information in a photo.
 The method uses a series of filters to isolate specific characteristics of the vehicle.

2. RELATED STUDIES

2.1 Optical Character Reader

Optical character recognition or **optical character reader**, often abbreviated as **OCR**, is the mechanical or electronic conversion of images of typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billboards in a landscape photo) or from subtitle text superimposed on an image (for example from a television broadcast).

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2.2 Google Vision

Google Vision API connects your code to Google's image recognition capabilities. You can think of Google Image Search as a kind of API/REST interface to images.google.com, but it does much more than show you similar images. Google Vision can detect whether you're a cat or a human, as well as the parts of your face.
It can also be used to recognise characters on number plate of a vehicle.

2.3 Artificial Intelligence

Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction. In computer science, artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals.

3. PROPOSED METHODS

To identify the relevant information regarding vehicles like – license number ,pollution rating, owner etc. by scanning the number plate of vehicle.
This project uses advancement in machine learning and recognizes the characters on number plate using Google vision which is a dependency provide by Google APIs
The program is designed for automatic number plate recognition of the following characteristic:

• Bulgarian cars
• Rectangle plate
• Single plate (one line of characters)
• White background and black characters
• A Different ambient conditions (garage, street, snow…)
• Arrangement of letters and numbers, LL NNNN LL

CHALLENGES AND LIMITATIONS

- Noise free image with uniform illumination required.
- Numbers must be displayed in one line on the number plate
- Problem associated with template image is proper acquisition of template required
- Poor file resolution, usually because the plate is too far away but sometimes resulting from the use of a low-quality camera.
- Blurry images, particularly motion blur.
- Poor lighting and low contrast due to overexposure, reflection or shadows.
- An object obscuring (part of) the plate, quite often a tow bar, or dirt on the plate.

- Read license plates that are different at the front and the back because of towed trailers, campers, etc.
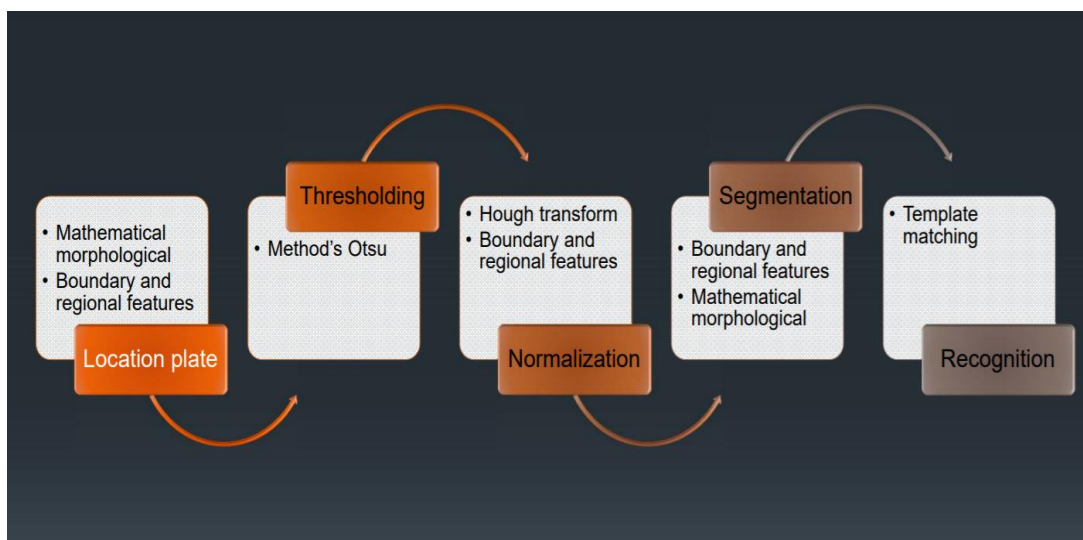- Vehicle lane change in the camera's angle of view during license plate reading.

Original Image

Binarised image

Inverted binarised image
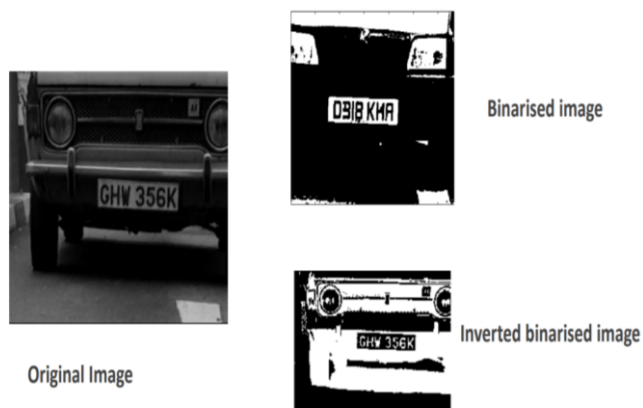
EXTRACTING NUMBER PLATE
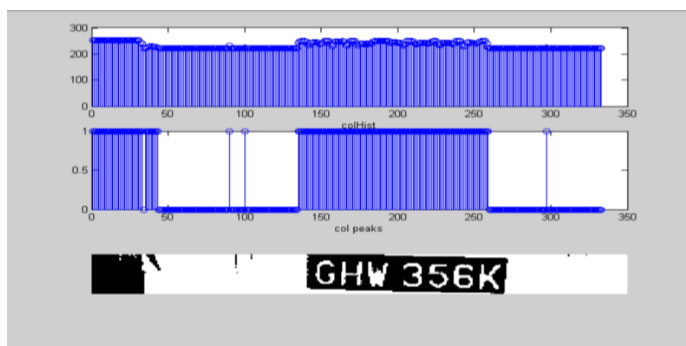
One piece of image that will be tested for number plate

SCHEMATIC OF THE SYSTEM

4. CONCLUSIONS

RESULT OF CORRELATION

- Basic form of convolution
- Result is an image, convolution of two matrices
- The size of result matrix will be increased from input image matrices
- Due to which we have to apply some thresh holding on resultant image
- Normally value of thresh hold is little less than maximum value of resultant image.

MODULAR STRUCTURE OF THE PROJECT

Binarised image

Inverted binarised image

Original Image

FEATURES

- This project uses technologies like android ,machine learning ,image processing.
- The language for this project is solely core java along with Google APIs in python which are imported and the environment is provided by android studio.
- The project will use camera in phone to capture the number plate of the vehicle and will recognize the character on it through optical character recognisation, it will directly connect to the database and will identify all the relevant data
- It will shorten the time duration by a large amount which is used to track the stolen cars
- Also it can be used with CCTV cameras for surveillance purposes in public places and will also help traffic police with implementation of traffic rules.

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FUTURE WORK

- We can use this project with CCTV cameras and GPS to reduce car theft and traffic regulation violation .
- We can connect multiple database to access information of any car parked in any public area.

5. REFERENCES

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