

An Integrated Automatic Number Plate Recognition for Recognizing Multi Language Fonts

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Abstract: Automatic Number Plate Recognition (ANPR) is a system for automatic recognition of license number plates. ANPR system uses Optical Character Recognition (OCR) technique for reading the license number plates. Template matching algorithm is applied for obtaining correct matches. English letters are used for registration mark and Aerobic numbers for figures. In-general the font faces used for number plates include Arial, Times New Roman, Calibri, Cambria and Kruti Dev. The present system may yield erratic results for number plates with fonts that are not stored in the template database (DB). ANPR has an ability to recognize and detect number plates with wide range of patterns. In the present work we address the integration of English and Hindi characters together that are used for number plates. We also mention the results and necessary environmental conditions for optimum results of the present system. The Morphological operation and OCR technique are employed for number plate recognition. The images used for testing and training purpose are taken from open source as well as clicking the photos by a good resolution camera (with resolution 8 Mega Pixel or more).

Keywords: Optical Character Recognition (OCR), Median Filter, Dilation, Erosion, Template matching

I. INTRODUCTION

Demand for vehicles are continuously increasing throughout the year in almost all parts of the world. More vehicles in the market are creating a lot of problems i.e. traffic problems, stolen vehicles problem, parking problem, vehicle management problem, etc. To overcome with these issues, there is a need to develop a highly interactive and advanced system which can control and manage all type of issues is highly warranted.

ANPR system plays a prime role in managing all the issues mentioned above. This is already used for managing car parking, toll collection and many other real life applications. There are 22 official languages used in India namely Assamese, Tamil, Telugu, Dogri, Gujarati, Santhali, Maithili, Kashmiri, Konkani, Hindi, Kannaada, Malayalam, Sanskrit, Oriya, Manipuri, Marathi, Nepali, Punjabi, Sindhi, Bengali, Bodo and Urdu [1]. English and Hindi languages are used in maximum states. Transport authority allows only English Arabic language for designing the number plate [2]. Apart from this, owner of vehicle uses various designs for the number plate and font faces Kruti Dev for other native language as per the area.

In current scenario, ANPR system is not used widely in India because some of the owners do not follow the traffic rules for designing the number plate of their vehicle. Mostly Hindi and English are used for this purpose. ANPR system can be used for recognize the English as well as Hindi characters of the number plate.

The major steps of ANPR are Image capturing, pre-processing, number plate extraction and recognition. Template matching algorithm is used to recognize the license number. Standard license number is recognized successfully and easily. There are some situation may be occur in which ANPR system displays wrong result, whenever characters of license plate is written in different font faces and they are not stored in predefined template database (DB). Apart from this, ANPR system is used in various real life applications such as Vehicle Parking System [3], Automatic Toll Collection [4], and Traffic Control System [5].

ANPR plays a prime role in Automatic Toll Collection, by identifying the number plate of the vehicle which is captured through License Plate Recognition camera (PLR cam). Then after in the central server after identify the number plate. The toll amount is deducted from the user account automatically and user gets the information through SMS [6]. Such type of technique gives us many benefits in the context of time-saving and removing queue problems. The above application is a pre-requirement for toll booths in India. There are some limitations are occurred such as different faces and format of the number plate. We discussed literature review of ANPR system for understanding the publishing works of the researchers and academicians of the subject.

Image acquisition is the first step of ANPR. Images are captured by different devices such as cameras, sensors and LPR cam and many more. Numbers of features are varies according to the type of image sources. It is the fact that better quality of the image gives better result with ANPR. Various factors are affected to ANPR results.

Pre-processing plays important role in the recognition of results. Various methods had been invented for pre-process the input image. Pre-processing has the ability to clear and enhance the features of the image. A review of pre-processing had been presented by S. Adatra and M. Mittal that discussed the various techniques. Median filter and Wiener filter are used