Face and Number plate recognition for Society Security

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ABSTRACT

Due to increase in forgery security is the major part of concern The objective is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate and face detection to detect authorized person and will notify the concerned person if unknown face or vehicle is detected You are a busy facilities manager/security manager in a city or confined environment; therefore, you have very limited space for society lanes entering and leaving your location. The system is implemented on the entrance for security control of a highly restricted area like military zones or area around top government offices e.g. Parliament, Supreme Court etc. it mainly usable for society Proposed work manages mechanized framework to distinguish and order the Faces utilizing CNN (Convolution Neural Network). so we are available a novel way to deal with take care of these kind of issues.

Keywords: ALPR, Face Recognition, Number plate recognition, Raspberry pi, Pi Camera, servo motor

I. INTRODUCTION

Normally in society the guard is responsible for recording the entry of the vehicles which is nothing but manual and as we know it depends on memorization which will not be accurate.so we are using a system which will serve the best. In this system we are using CNN for face recognition and detection and OCR for automatic number plate recognition. In face recognition we are using cascade classifier which contains the features of the face detection and then forming the anchor box using OPENCV which is a python library the system is as shows in fig1
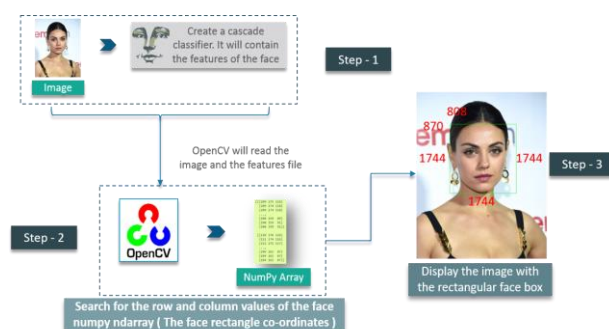
Face Detection Using OpenCV

Step 1: Considering our prerequisites, we will require an image, to begin with. Later we need to create a cascade classifier which will eventually give us the features of the face.

Step 2: This step involves making use of OpenCV which will read the image and the features file. So at this point, there are NumPy arrays at the primary data points.

Step 3: This final step involves displaying the image with the rectangular face box as in fig 2
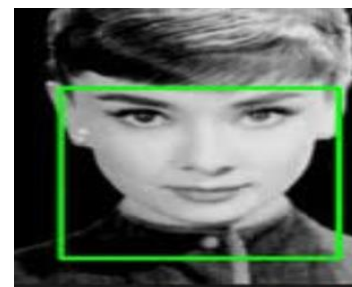

Fig1. Architecture of proposed model

Fig 2 Anchor box on face

ALPR recognizes a vehicle's license plate number from an image. It is fulfilled by the combination of a lot of techniques, such as object detection, image processing, and pattern recognition. The variations of the plate types or environments cause challenges in the detection and recognition of license plates as shown in fig3

Fig 3 Number plate recognition

Steps involved in ANPR are as

1.Recognising the region of interest(ROI) To detect an object in an image we first study its general characteristics and how it is different from other objects within the image

2 .Using appropriate filters To convert into RGB values from pixels

3. Read the plates

The first 2 letters of a license plate are alphabets, representing the state code, and the next two are numbers for the zone code

Using above two methods if a unknown vehicle or a face is detected then it will notify the concerned person through SMS and according to his permission the automatic Servo motor or automatic gat will get opened or will remained closed.

REAL TIME FACE DETECTION

For face detection ,we use both face and number plate at the same time for detection and accordingly access is granted .
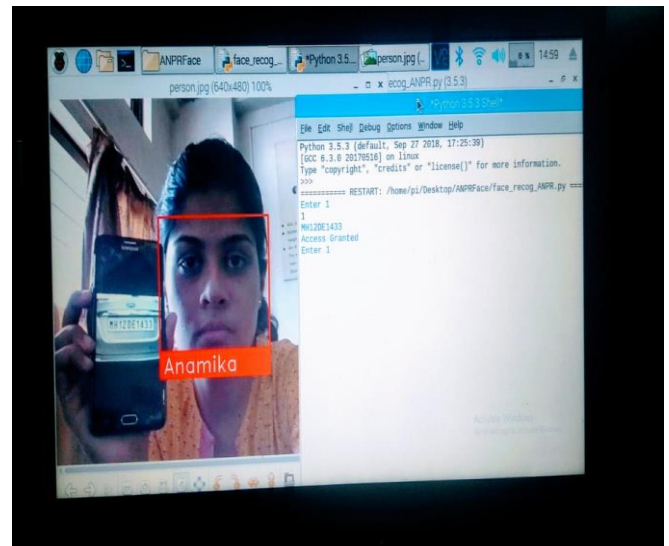

Fig 4 the number plate and face belongs to society .so, access is granted
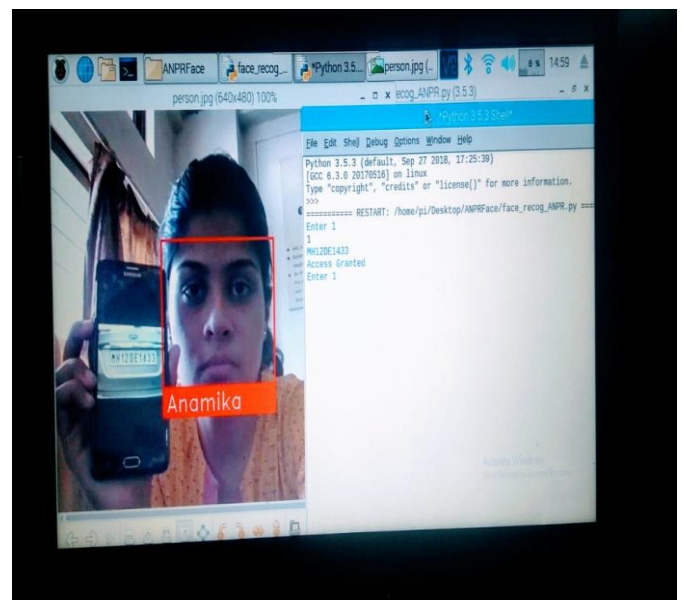

 fig 5 the access is denied because number plate do not belong to society.

These are the output what we get for real time face detection and recognition and accordingly access is granted and then only servo motor is opened or not .

Even outside the anchor box the person's name is being displayed w.

II. LITERATURE SURVEY

SR.NO	TITLE	AUTHORS	YEAR	DESCRIPTION	DISADVANTAGES
1.	number plate recognition for indian vehicles[1]	M. M. Shidore, S. P. Narote	2011	Number plate extraction is done using sobel filters and the morphological featues operations and connected component analysis	Deep shadows and reflections have an impact on number plate extraction work. Because of uneven illumination, stained number plates,.
2.	Automatic Licenses Plate Recognition[2]	Ronak P Patel1, Narendra M Patel2, Keyur Brahmbhatt3	2013	It contains new algorithm for number plate using Bounding box analysis for extraction, character recognition using Template method and Feature extraction	Difference in number plate formats, and influence of environmental factors affects number plate extraction.
3.	OCR optimization for vehicle number plate based on identification and template matching.[3]	Vikas upadhyay, Surbhi sharma	2015	This approach enables the localization of number plates in widely varying illumination conditions with English alphanumeric fonts, templates to validate the character on max correlation	The accuracy of the system is 95%
4.	New approach recognize number plate For indian conditions[4]	P.B.N.ChaKravarthy, E.Jagadeeswararao	2014	Horizontal and Vertical projection for character segmentation and template method to normalize character	Need to improve OCR algorithm.
5.	Deep neural network for human face recognition[5]	Priya gupta Nidhi saxena Meetiks sharma Jagriti tripati	2018	This paper uses a new way of using covnets instead of providing raw input pixels	Whenever license plate region is detected it is also rejected in character segmentation phase.
6.	Evaluation of Feature Extraction Techniques using Neural Network as a Classifier : A Comparative Review for face Recognition[6]	Vinodpuri RampuriGosavi, Dr. G. S. Sable Anil Deshmane	2018	feature extraction techniques such as ASM, AAM, Gabor features, Template based, and several are reviewed. neural classification networks such as convolutional, backpropagation, radial basis function etc.	This paper have minor disadvantage like scaling
7.	Face recognition under pose variation with local gabor features enhanced by active shape and statistical models[7]	Anastasia Bolotnikova, Hasan Demirel, Gholamreza Anbarjafari1	2015	Active state model feature extraction method ,more robust to changes in general conditions,more robust to 2D	Does not show much performance for 3D methods
8.	Patch based principal component analysis for Face recognition[8]	Chen Li, Wei Wei, Jiaxue Li , Wei Song	2016	has accuracy compared to one dimensional, two dimensional and two directional 2D PCA	Different size of patches brings different identifying results

III. PROPOSED METHODOLOGY

In this project various recognition techniques have been developed like face detection and and number plate recognition systems . • In entrance gate, number plates are used to identify the vehicles. When a vehicle enters an input gate, number plate is automatically recognized and stored in database and black-listed number is not given permission. When a vehicle later exits the place through the gate, number plate is recognized again and paired with the first-one stored in the database and it is taken a count.

Automatic number plate recognition systems can be used in access control space Project has four main subsystems, first is controller system and power supply.

We have implement a project, in this we install all the components in the board which are perfectly connected to the controller we are used. A microcontroller which is used to control all the operations as shown in fig4

IV. CONCLUSION

Once the user with valid of face detection and number plate recognition, and he is authorized then gate will be opened and he will park his vehicle in the available slot. If face detect/ vehicle is unauthorized, then also open the gate but face is undetected or vehicle recognize then send and text message also if face not detect/vehicle not detect with stored database then also send an text message the gate will not be opened and he is not allowed to park. If the user is not authorized, then gate will not open and doesn't allow him to park. The project is working fine, The prototype of our idea is ready and can be launched anywhere for the betterment of society.
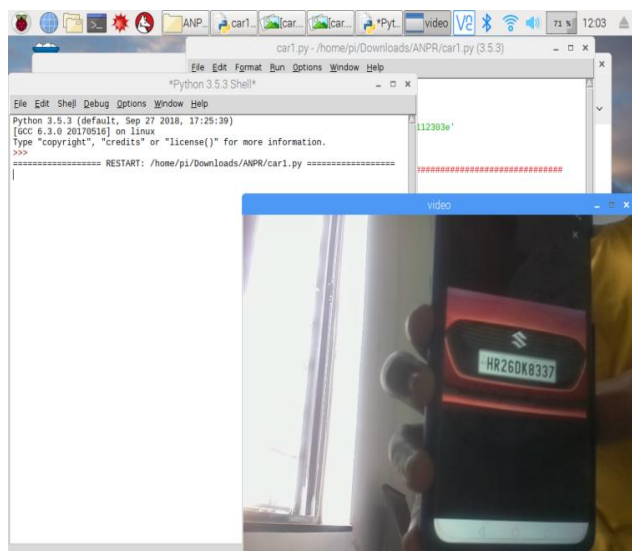

Fig 4 Number Plate recognition

The face detection and recognition is done using OPENCV using python code and the anchor box is formed when a face is detected and through PCA algorithm face recognition is done as shown in fig4.

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