**Algorithm 1: Finding Possible Plates**

**1: Input:** Image of Original Scene(imgOriginal)

**2: Output:** List of Possible Plates(plate[])

**3:**/\*preprocessing of image\*/

**4:** imgGrayscale= cv2.cvtColor(imgOriginal, cv2.COLOR\_BGR2HSV.value);

**5:** imgThreshold = cv2.adaptiveThreshold(imgGrayscale);

**6:** **l**istOfPossiblePlateChars**=** findPossibleCharsofPlate (imgThreshold);

**7:** **for each** i **in****l**istOfPossiblePlateChars **do**:

**8:** listOfListsOfMatchingChars= findListOfListsOfMatchingChars(i);

**9: End for**

**10: for each** i listOfListsOfMatchingChars **do**:

**10:** plate[i]= ExtractPlate(i);

**12: End for**

**13: return** plate;

**Algorithm 2: Finding Charters from Plates**

**1: Input:** List of Possible Plates(plate[])

**2: Output:** Actual plate

**3: for each** img **in** plate[] **do:**

**4:** plate.imgGrayscale= cv2.cvtColor(plate[img], cv2.COLOR\_BGR2HSV.value);

**5:** plate.imgThreshold = cv2.adaptiveThreshold(plate.imgGrayscale);

**6:** /\*applying KNN\*/

**7:** plate[i].**listOfPossibleChars=** findPossibleChars (plate[img]);

**8:** actualplate= Max.len(plate[img]);

**9: return** actualplate;

Lots of research has been done by the previous researchers in

the field of image processing to detect the car license plate

using gray scale method, localisation, segmentation and

recognition[15]. Image processing method using modular

system has been reported by Sungkwan Je et. al. [23]. Among

various Deep learning architectures, they have used Caffe net

for recognizing the images. A method for vehicle number

plate detection and recognition using segmentation and feature

extraction was proposed by Lazrus et al.[4]. Koval et al.[5]

proposed an algorithm that deblurred the number plate images

and feed forward neural network technique was embarked for

the recognition process. Ozbay and Ercelebi[6] worked on the

smearing and dilation technique for automatic vehicle

identification. Shidore and Narote[7] proposed histogram

equalization followed by dilation and erosion for plate area

extraction. SVM classifiers were used for character

recognition. Kumar et al.[8] proposed a method based on edge

detection using Hough Transform. Massoud et al.[9] devised a

system using dilation, smearing and erosion. Chen and Luo

[10] and Du et al.[2] located license plate using improved

prewitt operation. Khalil [11] suggested an approach based on

moving window with template matching technique. In [16],

Vehicle Number Plate Detection for Indian Vehicles, briefly

discusses on segmentation and feature extraction by template

matching for recognition process. All the work reported in the

literature associated with number plate detection are based on

hand crafted feature extraction techniques. No one has tried

self generated feature learning techniques for information

extraction from vehicle number plate.

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378

Keeping the above viewpoints in mind the proposed work

aims to exploit the feature learning capability of convolution

neural network (CNN) for extracting information, more

particularly, the state or province associated with the

registration of the owned vehicle from the number plate.

In the past years, lots of research and progress are ongoing in the field of image processing and to detect the license plate of a car correctly. Moreover, Grayscale method, segmentation localization is some of the basic techniques to solve this problem.[15]. But this method does not perform very well. It fails to detect unnecessary contour which further remain in the scene and result in various noise issues. In a complex domain of problems, modularity is a good way to solve the problem in the field of image processing. Modularity in image processing technique has been introduced by Sungkwan Je et. al. [23]. Template matching is another way to detect the license plate. This technique was designed and developed for for parking management to recognize registered and unregistered vehicle. If we see in the field of machine learning and deep learning techniques, most of the researched has used caffe net in achieving the required modularity. A novel method by Lazarus et al. [4] Convolution Neural Networks (CNNs) is a special kind of feed forwarding neural network which was used by Kaval et al for detection process.[5]This method proposed a special technique that deblurred the numberplate images thus use feed forwarding neural network technique for detection and classification of plates. Edge detection technique is a very popular method of detection numberplate. Sobel [6] and canny [7] are two of the most popular edge detection techniques. In the Sobel-Feldman operator act as a discrete differentiation operator. It tries to compute an approximate gradient of image intensity. The horizontal and vertical filter makes the computation easy and simple. But this method largely suffers from noise. The canny method on the other hand use Gaussian filter for noise reduction but it requires high level of complex computation. Serkan Ozbay, and Ergun Ercelebi [8] has used smearing and different morphological transformation techniques to reduce noise. They first have used histogram equalization followed by the several morphological transformations. And a SVM classifier is used for character recognition. All these above-mentioned approaches and methods are very complex to develop and have higher computational time. Moreover, most of these methods are region specific and can’t be used in every single possible kind of numberplate recognition. A unified new technique or algorithm that can solve this problem can be very much useful for present days.

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