TEAM 15- PROJECT REVIEW

TOPIC: LICENSE NUMBER PLATE RECOGNITION

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OBJECTIVE:

This project aims to recognize license number plates. In order to detect license number plates, we will use OpenCV to identify number plates and python pytesseract to extract characters and digits from the number plates.
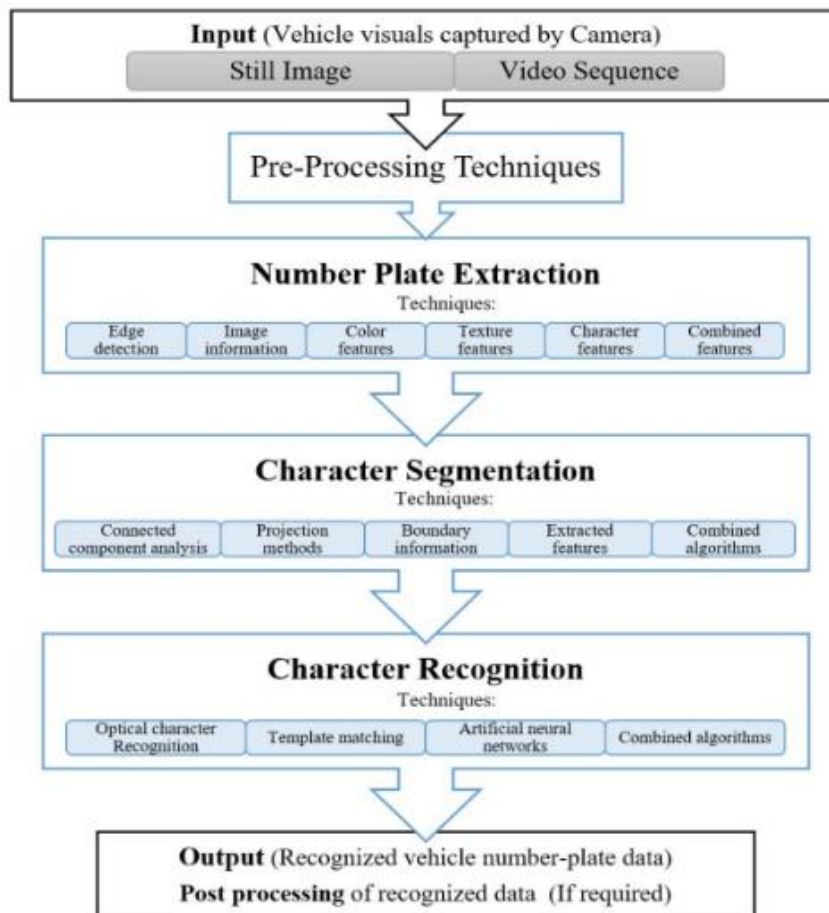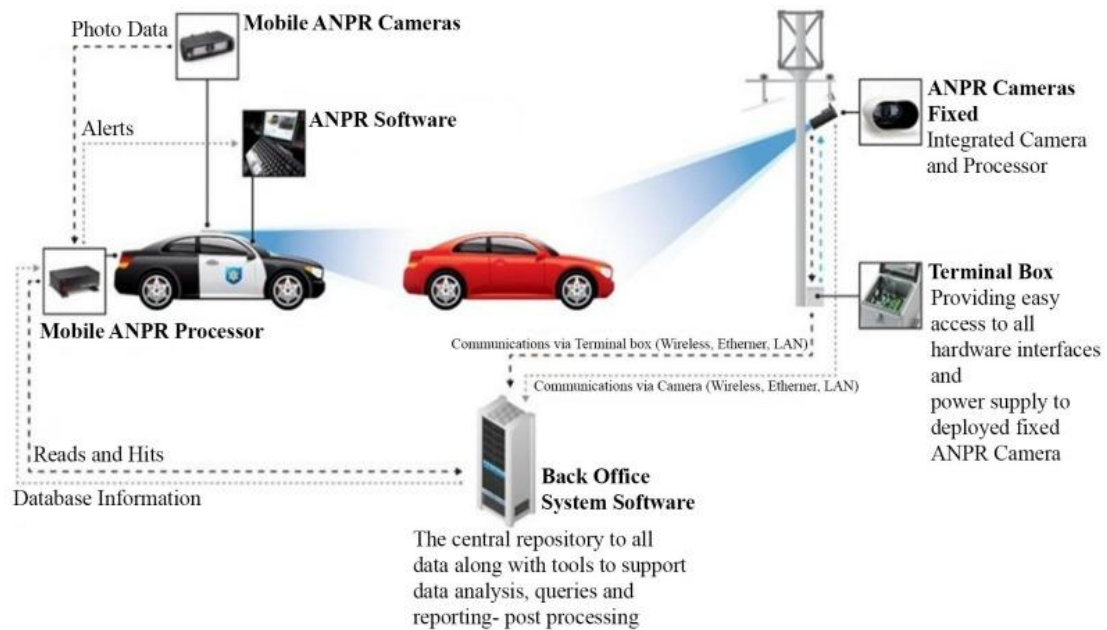
PROBLEM STATEMENT:

We considered the vehicle number plate as input image ,system should extract that number from the image and should search the database for that recognized number plate. It should recognize the number plate even in the low light or shadow like conditions.

SOFTWARE REQUIREMENT:

- **OPEN CV**
- **PYTESSERACT**

ARCHITECTURE DIAGRAM:

Mobile ANPR Cameras — Photo Data

Alerts

ANPR Software

Mobile ANPR Processor

Reads and Hits

Database Information

Communications via Terminal box (Wireless, Etherner, LAN)

Communications via Camera (Wireless, Etherner, LAN)

ANPR Cameras Fixed
Integrated Camera and Processor

Terminal Box
Providing easy access to all hardware interfaces and power supply to deployed fixed ANPR Camera

Back Office System Software
The central repository to all data along with tools to support data analysis, queries and reporting- post processing

Input (Vehicle visuals captured by Camera)

| Still Image | Video Sequence |

Pre-Processing Techniques

Number Plate Extraction
Techniques:

| Edge detection | Image information | Color features | Texture features | Character features | Combined features |

Character Segmentation
Techniques:

| Connected component analysis | Projection methods | Boundary information | Extracted features | Combined algorithms |

Character Recognition
Techniques:

| Optical character Recognition | Template matching | Artificial neural networks | Combined algorithms |

Output (Recognized vehicle number-plate data)
Post processing of recognized data (If required)

TESTING CODE:

File Edit Format Run Options Window Help

```python
import numpy as np
import cv2
import  imutils
import sys
import pytesseract
import pandas as pd
import time


while True:
        num_data = input("Enter : ")
        image = cv2.imread(num_data+'.jpg')
        image = imutils.resize(image, None)
        cv2.imshow("Original Image", image)
        gray = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)
        gray = cv2.bilateralFilter(gray, 11, 17, 17)
        edged = cv2.Canny(gray, 170, 200)
        cnts, _  = cv2.findContours(edged.copy(), cv2.RETR_LIST, cv2.CHAIN_APPROX_SIMPLE)
        cnts=sorted(cnts, key = cv2.contourArea, reverse = True)[:30]
        NumberPlateCnt = None
        count = 0
        for c in cnts:
                peri = cv2.arcLength(c, True)
                approx = cv2.approxPolyDP(c, 0.02 * peri, True)
                if len(approx) == 4:
                    NumberPlateCnt = approx
                    break
        mask = np.zeros(gray.shape,np.uint8)
        new_image = cv2.drawContours(mask,[NumberPlateCnt],0,255,-1)
        new_image = cv2.bitwise_and(image,image,mask=mask)
        cv2.namedWindow("Final_image",cv2.WINDOW_NORMAL)
        cv2.imshow("Final_image",new_image)
        config = ('-l eng --oem 1 --psm 3')
        pytesseract.pytesseract.tesseract_cmd = r"C:\Program Files\Tesseract-OCR\tesseract.exe"
        text = pytesseract.image_to_string(new_image, config=config)
        raw_data = {'date': [time.asctime( time.localtime(time.time()) )],
                'v_number': [text]}
        df = pd.DataFrame(raw_data, columns = ['date', 'v_number'])
        df.to_csv('data.csv')
        print(text)
        cv2.destroyAllWindows()
```

OUTPUT:

```
Python 3.9.5 (tags/v3.9.5:0a7dcbd, May  3 2021, 17:27:52) [MSC v.1928 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\ajays\Downloads\car\Vehicle-Number-Plate-Reading-master\test
.py
KL 21S 8086    I
□
```

INPUT IMAGE:

FINAL IMAGE:

APPLICATION:

Access control systems use it for a license plate- based entry/exit control. Modern highways use this for automated toll control .Traffic management systems use license plate recognition for identifying wanted vehicles ,detecting speeders and violators .It is used for congestion charging ,journey time measurement(JTMS),and more in smart cities.