Walchand College of Engineering ,Sangli

An Autonomous Institute

Locating the license plate of vehicle using openCV for IP

Guided by
Prof.K.P.Kamble

Project by -
1)Shridhar Patil 2017btecs00040
2)Aniket Modak 2017btecs00068
3)Neha Jawanjal 2018btecs00212

Problem Statement :

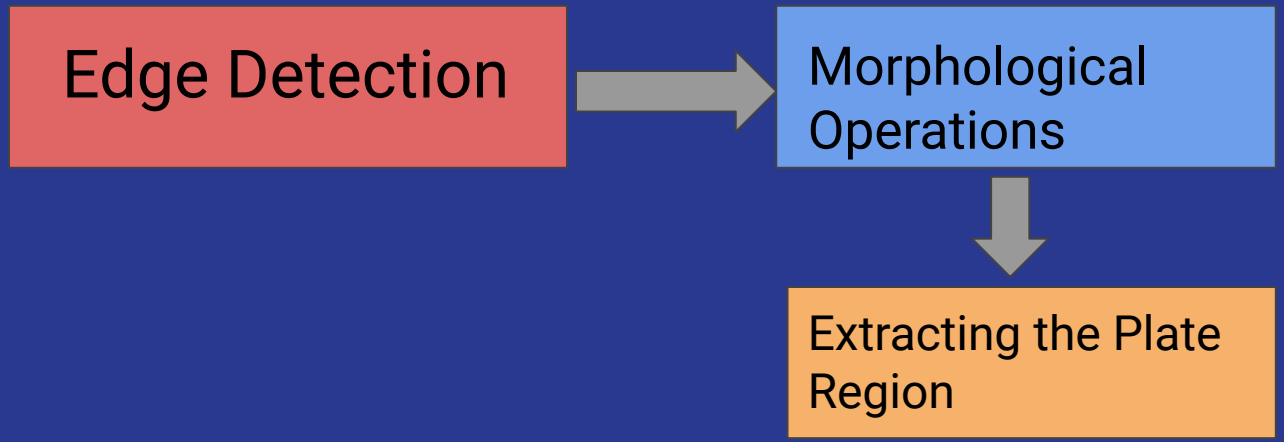
Locating the license plate of vehicle using openCV for IP-

#AIM:-

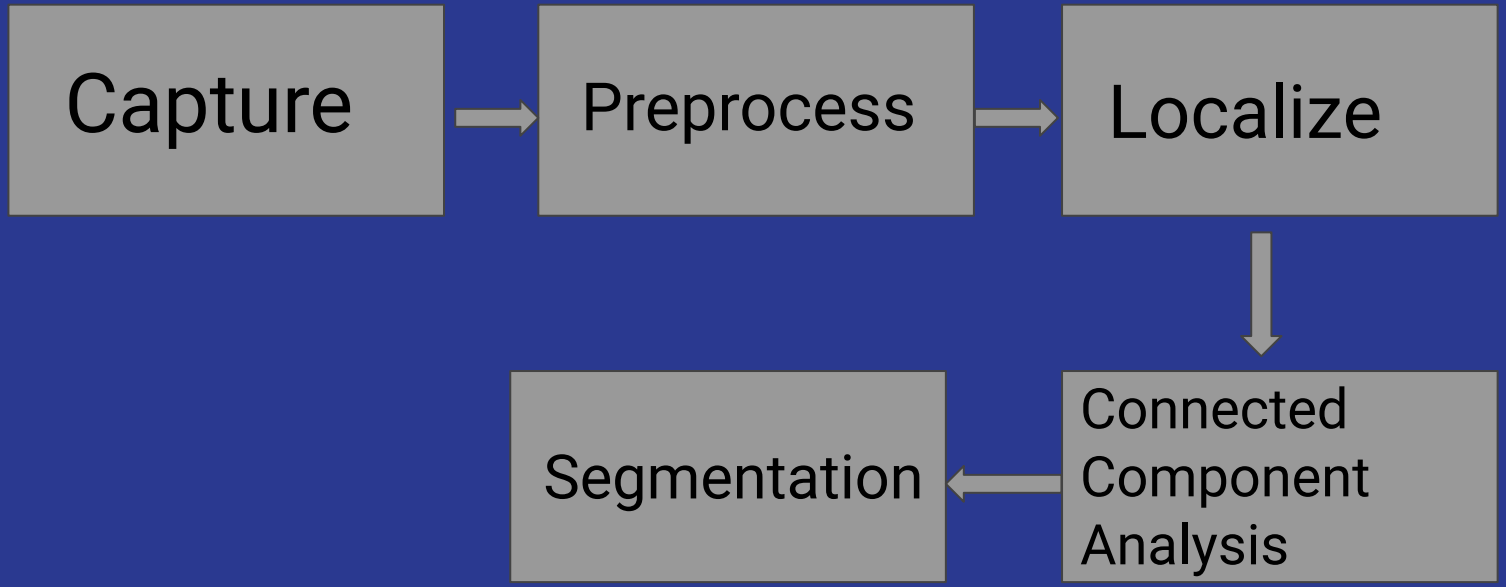
1) To build a Number Plate Detector System which will localize the number plate as the Region of Interest given the image of a Car/Vehicle

Basic Modules of the System:

1) License Plate Localization:



Proposed System :



1) Capture: The image of the vehicle is captured using a high resolution photographic camera

2) Preprocess :Preprocessing is the set algorithms applied on the image to enhance the quality. a)Resize – Image is to be resized to a feasible aspect ratio. b)Convert Colour Space – RGB mode to Grayscale

3) Localize : (i)Localization is basically a process of binarizing the image.(ii) There are two motivations for this operation – 1. Highlighting characters 2. Suppressing background (iii)Localization is done by an image processing technique called Thresholding

4) Connected Component Analysis:To eliminate undesired image Areas.

5) Segmentation: Segmentation is the process of cropping out the labelled blobs. These blobs are expected to be the required portion of the license number

Requirements:

1) Python: -

+Very clear, readable syntax.
+Strong introspection capabilities.
+Full modularity.
+Exception-based error handling.

2) OpenCV :-

+ real time computer vision
+ free for use

Implementation:

1. Read the Image:
image = cv2.imread(imagePath)

2. Convert Image to Grayscale:
grayscaleImage = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

3. Noise Removal using Bilateral Filtering:
noiseRemovedImage = cv2.bilateralFilter(grayscaleImage, 9, 75, 75)

4. Histogram Equalization for Improving Contrast:
histEqImage = cv2.equalizeHist(image)

5. Morphological Opening of Histogram Equalized Image using 5x5 Kernel: morphImage = cv2.morphologyEx(histEqImage, cv2.MORPH_OPEN, structElem, iterations=15)

6. Subtracting the morphed image from Histogram Equalized Image:subtractedImage = cv2.subtract(histEqImage, morphImage)

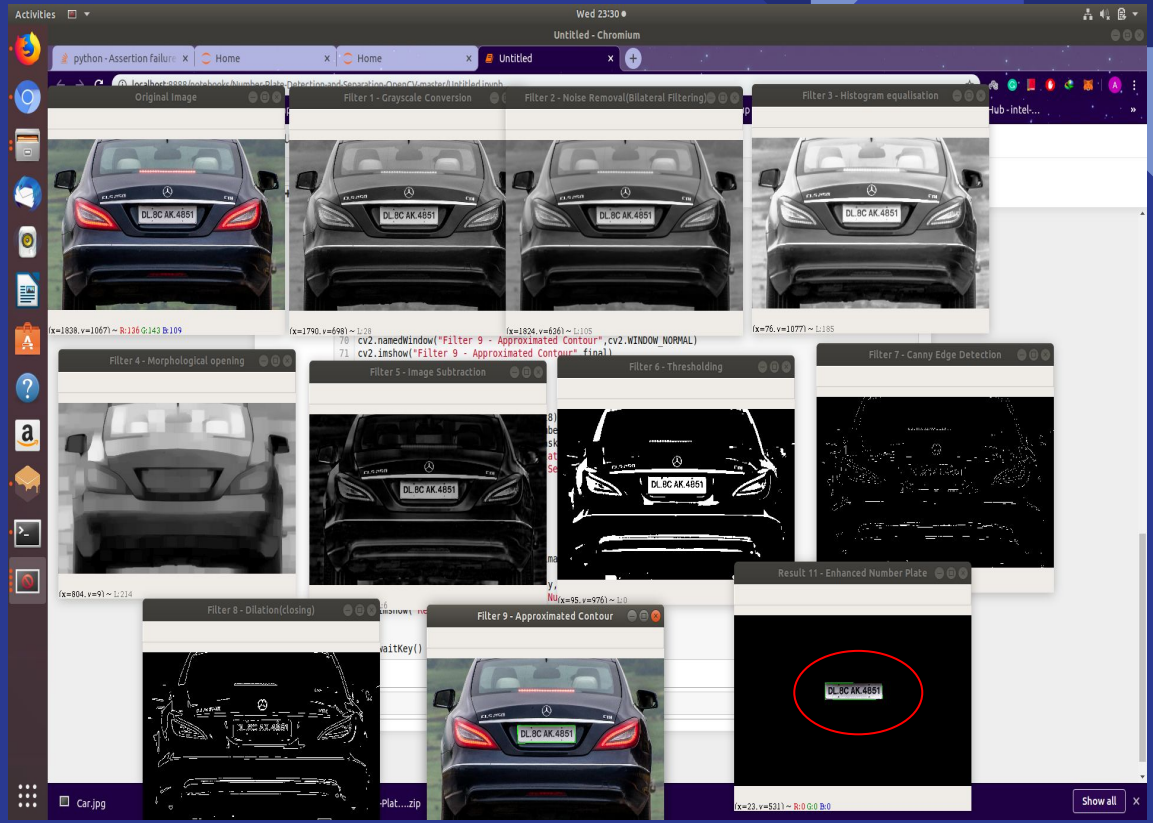
7. Thresholding subtracted image:threshImage = cv2.threshold(subtractedImage, 0, 255, cv2.THRESH_OTSU)

8. Canny Edge Detection:edgeDetectedImage = cv2.Canny(threshImage, threshold1=250, threshold2=255)

9. Contour Detection and Polygon Approximation to find Number Plate:
1. contours = cv2.findContours(image, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE) 2. approximatedPolygon = cv2.approxPolyDP(contour, 0.06*contourPerimeter, closed=True)

Results:

Captured Image
(Original image)



Reference:

1)Prathamesh Kulkarni, Ashish Khatri, Prateek Banga, Kushal Shah, Automatic Number Plate Recognition (ANPR) System for Indian conditions
2)https://en.wikipedia.org/wiki/Canny_edge_detector
3) http://opencv.willowgarage.com/documentation/python/
4) A.Conci, J. E. R. de Carvalho, T. W. Rauber, A Complete System for Vehicle Plate Localization, Segmentation and Recognition in Real Life Scene, IEEE LATIN AMERICA TRANSACTIONS, VOL. 7, NO. 5, SEPTEMBER 2009
5) Nobuyuki Otsu (1979). A threshold selection method from gray-level histograms. IEEE Trans. Sys., Man., Cyber. 9: 62-66.

THANK YOU !!!!!!