

CAR NUMBER PLATE DETECTION USING MATLAB

SANDEEP KUMAR NAYAK

B219048

ETC

PRESENTATION OUTLINE

TOPICS TO DISCUSS

About The Project
Project Overview
Template Creation
Letter Detection
Number Plate Detection
Conclusion

ABOUT THE PROJECT

Ever wondered that how an ANPR
(Automatic Number Plate
Recognition) system works?

A BRIEF BACKGROUND



Used to call the saved images of alphanumerics and then save them as a new template in MATLAB memory.


```

Plate_detection.m X Letter_detection.m X template_creation.m X +
1 - close all;
2 - clear all;
3
4 - im = imread('Number Plate Images/image1.png');
5 - imgray = rgb2gray(im);
6 - imbin = imbinarize(imgray);
7 - im = edge(imgray, 'prewitt');
8
9 %Below steps are to find location of number plate
10 - Iprops=regionprops(im,'BoundingBox','Area', 'Image');
11 - area = Iprops.Area;
12 - count = numel(Iprops);
13 - maxa= area;
14 - boundingBox = Iprops.BoundingBox;
15 - for i=1:count
16 -     if maxa<Iprops(i).Area
17 -         maxa=Iprops(i).Area;
18 -         boundingBox=Iprops(i).BoundingBox;
19 -     end
20 - end
21
22 - im = imcrop(imbin, boundingBox);%crop the number plate area
23 - im = bwareaopen(~im, 500); %remove some object if it width is too long or too small than 500
24
25 - [h, w] = size(im);%get width
26
27 - imshow(im);
28
29 - Iprops=regionprops(im,'BoundingBox','Area', 'Image'); %read letter
30 - count = numel(Iprops);
31 - noPlate=[]; % Initializing the variable of number plate string.
32
33 - for i=1:count
34 -     ow = length(Iprops(i).Image(1,:));
35 -     oh = length(Iprops(i).Image(:,1));
36 -     if ow<(h/2) & oh>(h/3)
37 -         letter=Letter_detection(Iprops(i).Image); % Reading the letter corresponding the binary image 'N'.
38 -         noPlate=[noPlate letter] % Appending every subsequent character in noPlate variable.
39 -     end
40 - end

```

LETTER DETECTION

Reads the characters from
the input image and find the
highest matched
corresponding alphanumeric

**Process the image and then
call the above two m-files to
detect the number**

```
1      %CREATE TEMPLATES
2      %Alphabets
3      A=imread('alpha/A.bmp');B=imread('alpha/B.bmp');C=imread('alpha/C.bmp');
4      D=imread('alpha/D.bmp');E=imread('alpha/E.bmp');F=imread('alpha/F.bmp');
5      G=imread('alpha/G.bmp');H=imread('alpha/H.bmp');I=imread('alpha/I.bmp');
6      J=imread('alpha/J.bmp');K=imread('alpha/K.bmp');L=imread('alpha/L.bmp');
7      M=imread('alpha/M.bmp');N=imread('alpha/N.bmp');O=imread('alpha/O.bmp');
8      P=imread('alpha/P.bmp');Q=imread('alpha/Q.bmp');R=imread('alpha/R.bmp');
9      S=imread('alpha/S.bmp');T=imread('alpha/T.bmp');U=imread('alpha/U.bmp');
10     V=imread('alpha/V.bmp');W=imread('alpha/W.bmp');X=imread('alpha/X.bmp');
11     Y=imread('alpha/Y.bmp');Z=imread('alpha/Z.bmp');
12
13     %Natural Numbers
14     one=imread('alpha/1.bmp');two=imread('alpha/2.bmp');
15     three=imread('alpha/3.bmp');four=imread('alpha/4.bmp');
16     five=imread('alpha/5.bmp'); six=imread('alpha/6.bmp');
17     seven=imread('alpha/7.bmp');eight=imread('alpha/8.bmp');
18     nine=imread('alpha/9.bmp'); zero=imread('alpha/0.bmp');
19
20     %Creating Array for Alphabets
21     letter=[A B C D E F G H I J K L M N O P Q R S T U V W X Y Z];
22     %Creating Array for Numbers
23     number=[one two three four five six seven eight nine zero];
24
25     NewTemplates=[letter number];
26     save ('NewTemplates','NewTemplates')
27     clear all
```



```

1  - function letter=readLetter(snap)
2
3  - load NewTemplates
4  - snap=imresize(snap,[42 24]);
5  - rec=[];
6
7  - for n=1:length(NewTemplates)
8  -     cor=corr2(NewTemplates{1,n},snap);
9  -     rec=[rec cor];
10 - end

```

In the template_creation.m file we have design the code to save all the binary images of alphanumerics into a directory or file named as 'NewTemplates'. Then that directory is called in the Letter_detection.m

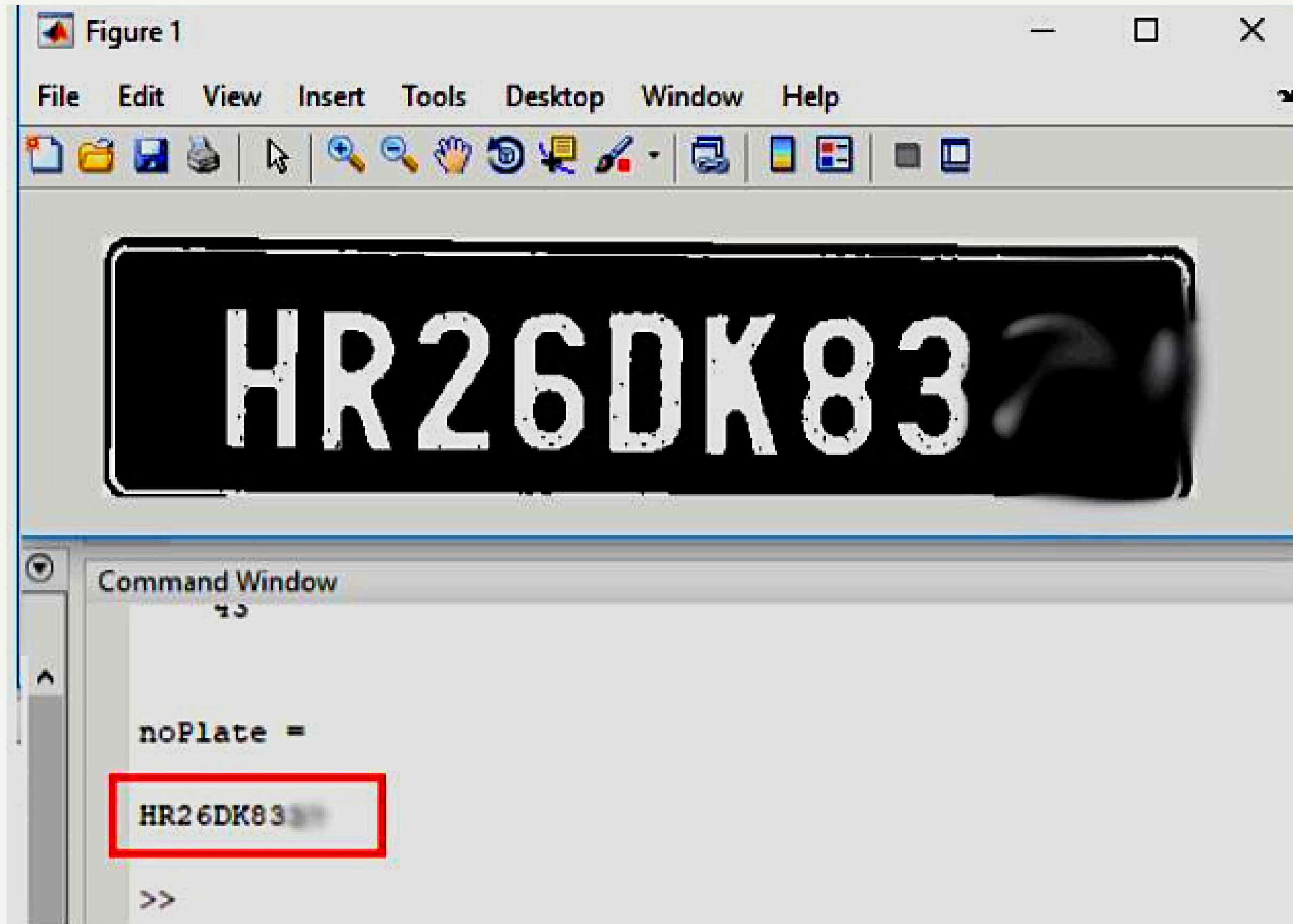
```

33 - for i=1:count
34 -     ow = length(Iprops(i).Image(1,:));
35 -     oh = length(Iprops(i).Image(:,1));
36 -     if ow<(h/2) & oh>(h/3)
37 -         letter=Letter_detection(Iprops(i).Image);
38 -         noPlate=[noPlate letter]
39 -     end
40 - end

```

Then in the Plate_detection.m code file the Letter_detection.m code file is called when we process the image

OUTPUT



CONCLUSION

COMPLETE WORKING OF VEHICLE LICENSE
NUMBER PLATE DETECTION SYSTEM IS
DEMONSTRATED



THANK YOU

Sandeep kumar Nayak

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