



Comparison of Vehicle License Recognition Algorithms

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Discipline of the thesis: Computer Vision

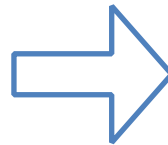
Supervisor: Zhao Chun

Word Count: 6582

-Programming Project

-Describes, analyzes and compares different computer vision algorithms applied in vehicle license recognition, discussing their advantages, disadvantages and applicability

-A full license-plate recognition algorithm is coded, using MATLAB as its platform





Comparison of Vehicle License Recognition Algorithms



Preprocessing



License Plate
Locating &
Segregation



Character Segregation



OCR



Preprocessing

Resizing

Graying

Graying Comparison



Part1 Program Demo

LAB Image



L Axis



LAB Image



L Axis



A Axis



B Axis



A Axis



B Axis

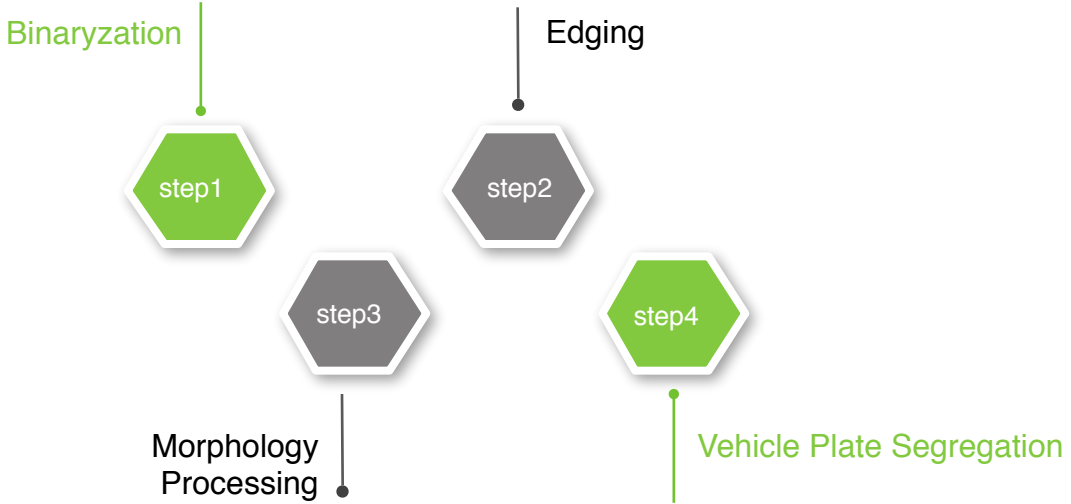


```
Blue_y=zeros(y,1);
for i=1:y
    for j=1:x
        if(myI(i,j,1)==1)
            Blue_y(i,1)= Blue_y(i,1)+1;%像素点统计
        end
    end
end
[temp MaxY]=max(Blue_y);%Y方向车牌区域确定
PY1=MaxY;
while ((Blue_y(PY1,1)>=5)&&(PY1>1))
    PY1=PY1-1;%找到上边界点
end
PY2=MaxY;
while ((Blue_y(PY2,1)>=5)&&(PY2<y))
    PY2=PY2+1;%找到下边界点
end
IY=I(PY1:PY2, :, :); %确定上、下边界
```




License Plate Locating
& Segregation

Part2 License Plate Locating & Segregation



Original Image



Sobel operator



Roberts operator



Prewitt operator



Laplacian operator

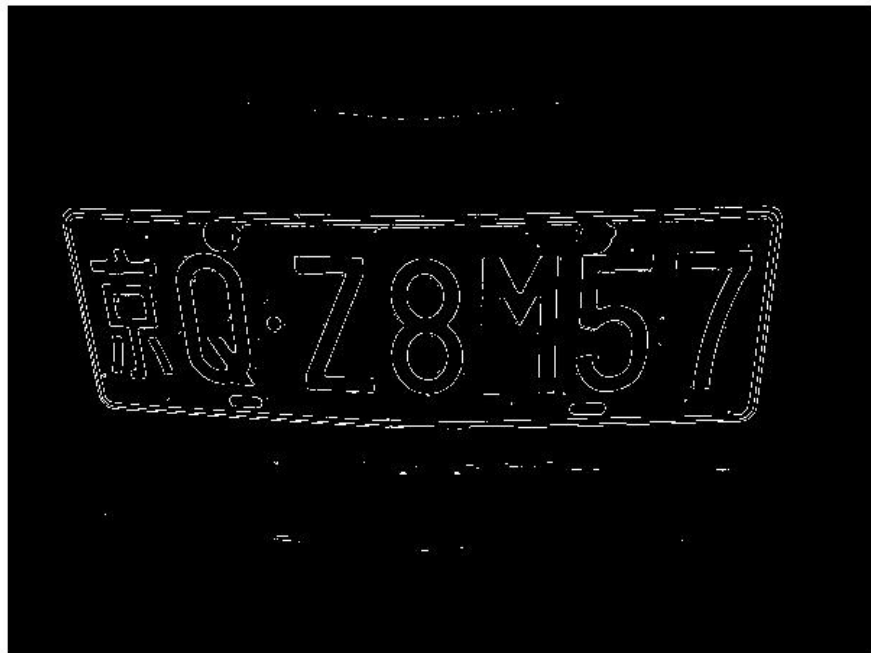


Canny operator

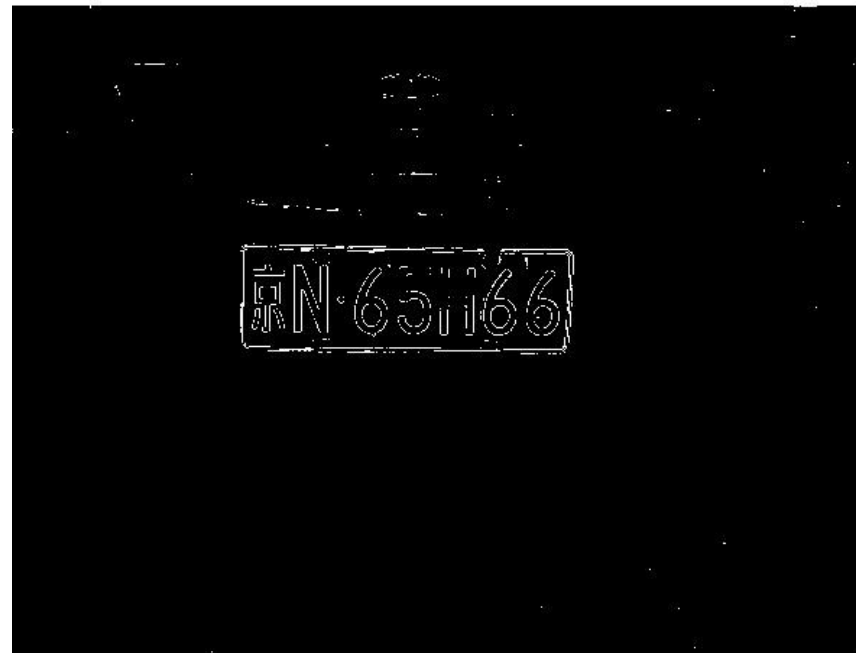




Roberts0.024



Roberts0.024





A Erode



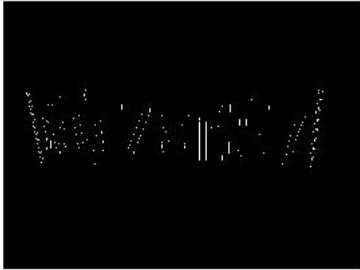
1 Dilate



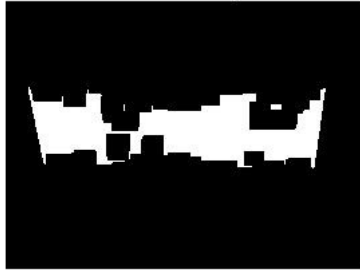
B Small Area Elimination



After erosion



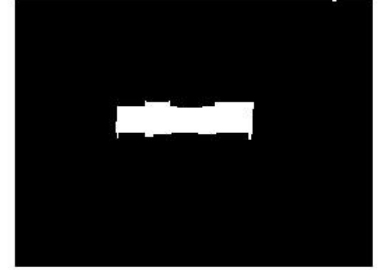
After Close Compound



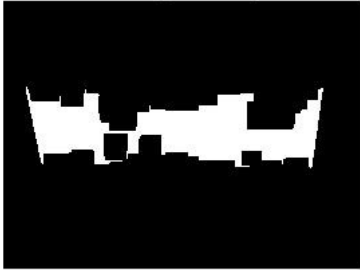
After erosion



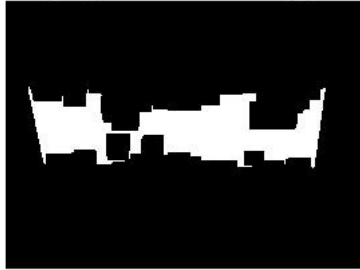
After Close Compound



Eliminating small objects



Eliminating region other than the biggest domain



Eliminating small objects



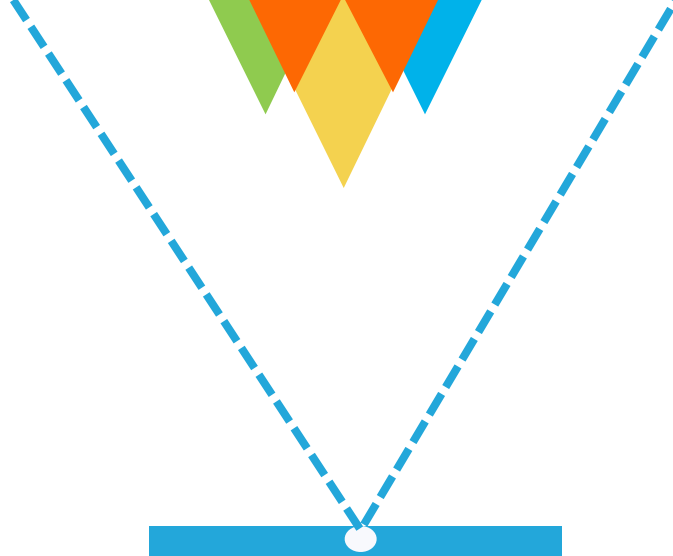
Eliminating region other than the biggest domain





Part2 Plate Segregation Demo





Character
Segregation

Angle Adjustment

Plate
Preprocessing

Character
Segregation

Part3 Angle Adjustment



Vehicle plate



1. Car Plate Image



2. Grayscale Car Plate



3. Edge Detecting



4. Slant Correction



Part3 Plate Processing







Pixel Comparison

Neuron Network



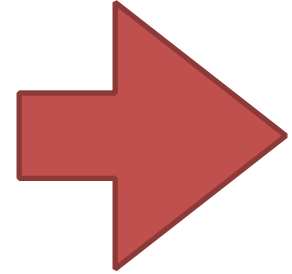
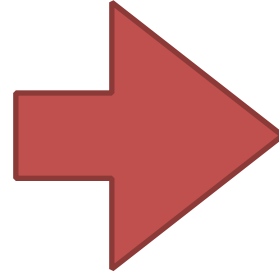
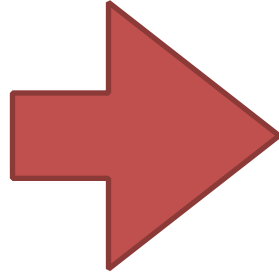
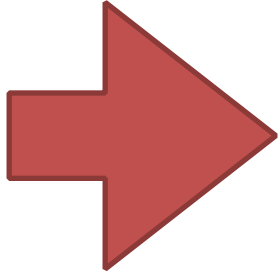
Compare Train Set and Test Set



Return the one have the highest similar rate



Output Result

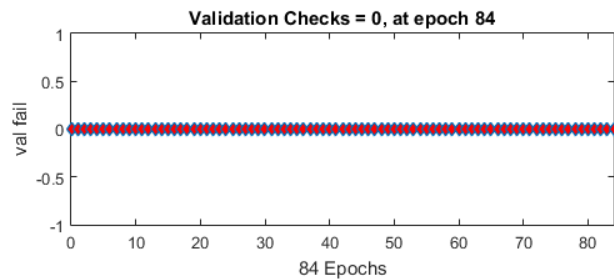
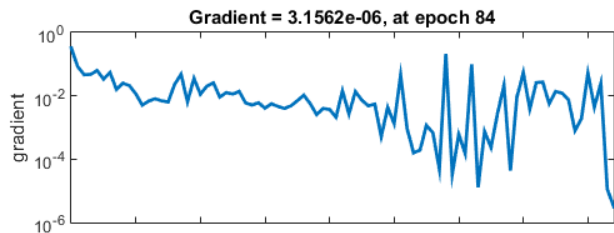


BP Network Learning

Output .mat

Input .mat

Result



QZ8M57



Part 5 Result



Detection

recall: 80%

precision: 90.9%

F = 0.8510



Segregation:

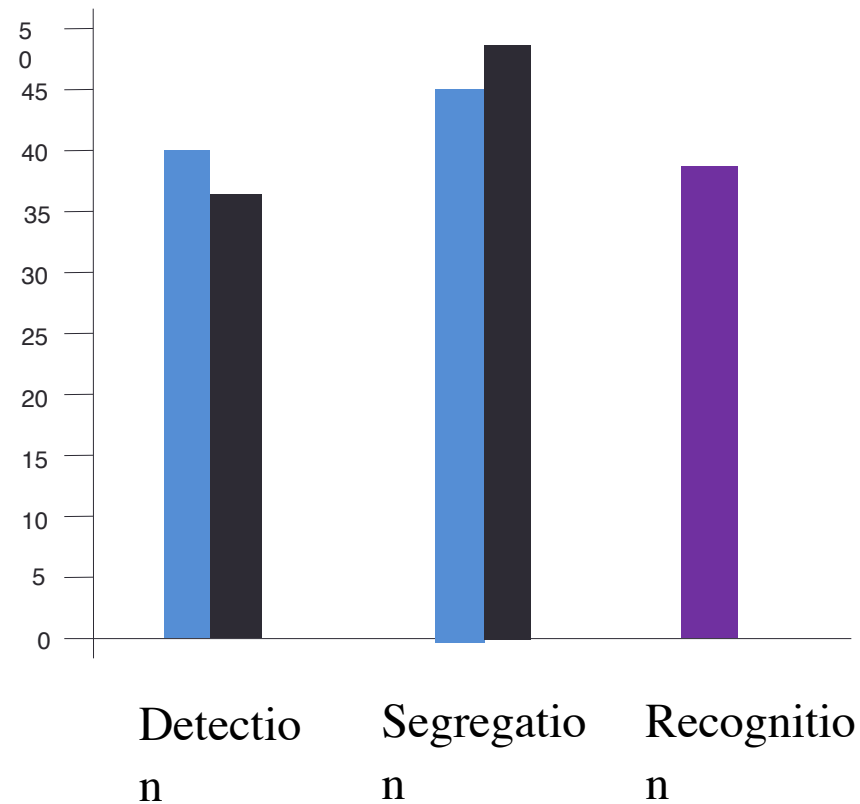
recall: 75.8%

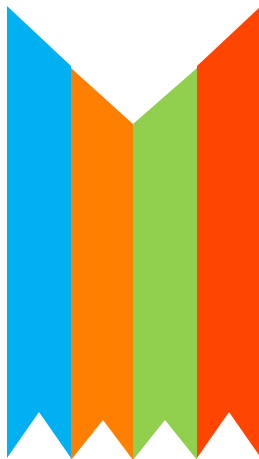
precision: 94.8%

F = 0.8424



Recognition: 76.9%





THX