

In the name of Allah



IRI License Plate Detection (LPD) and Recognition

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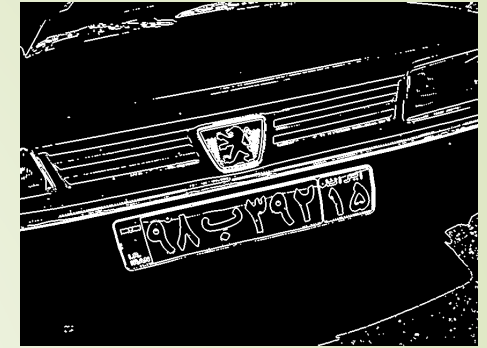
3-4 Rotation

3-5 Second filter: Omitting horizontal objects

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4 Character Recognition

5 Pros and Cons



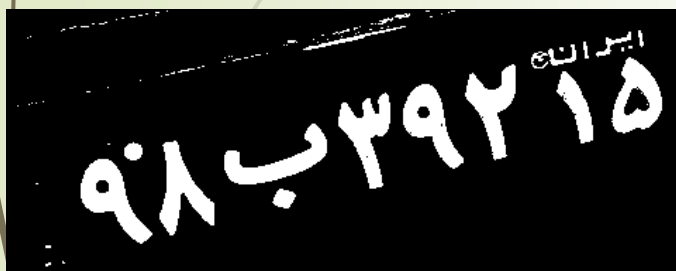
9 8 B 3 9 2 1 5

1 Preface

1-2 Limitations

الف ب پ ت ج د س ص ط ع ق ک ل م ن و ه ی

All 18 alphabets that are used at Iranian Standard Vehicle plates (after 2005)



Compare dot and other dot-shaped noises

Hindrances:

Orthography

Dots

Variation

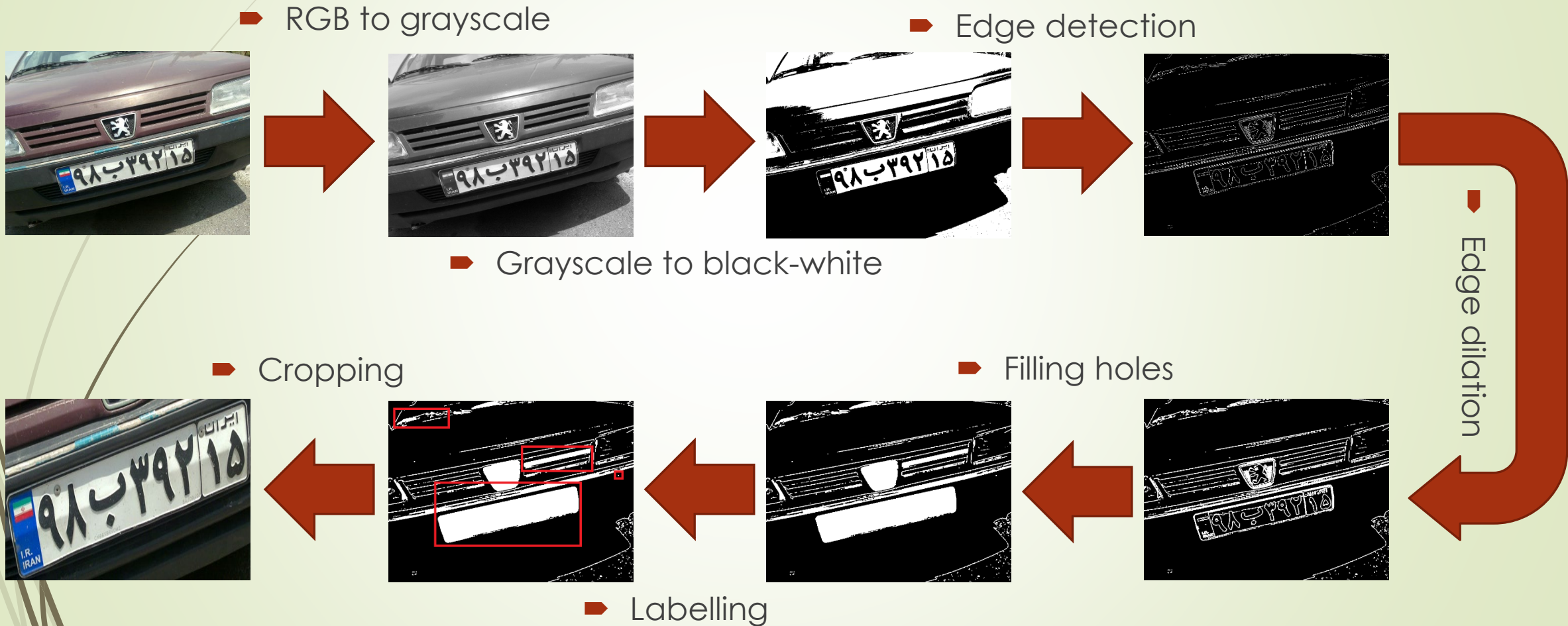


Different orthographies



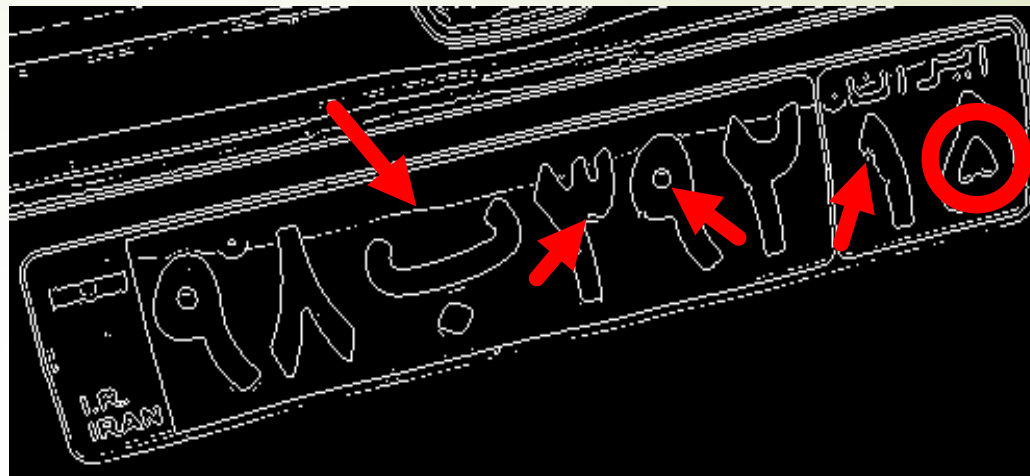
Some of Iranian Standard National Vehicle plates (after 2005)

2 License Plate Detection(LPD)



2 License Plate Detection(LPD)

Why do I use Black-white?



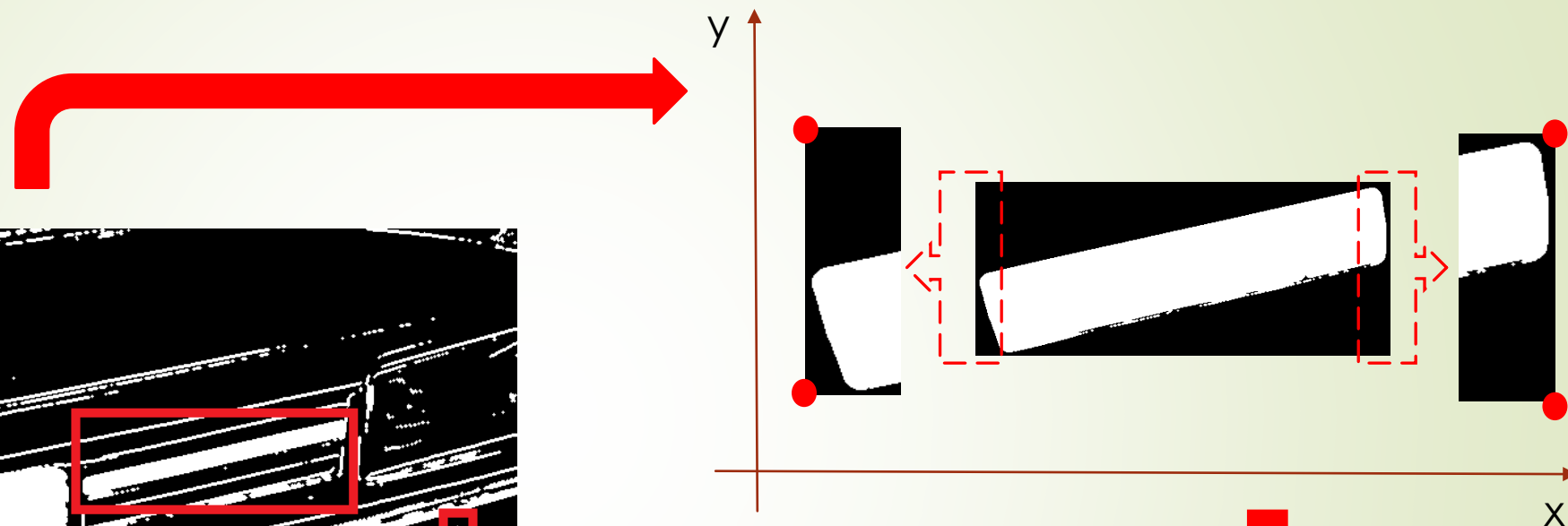
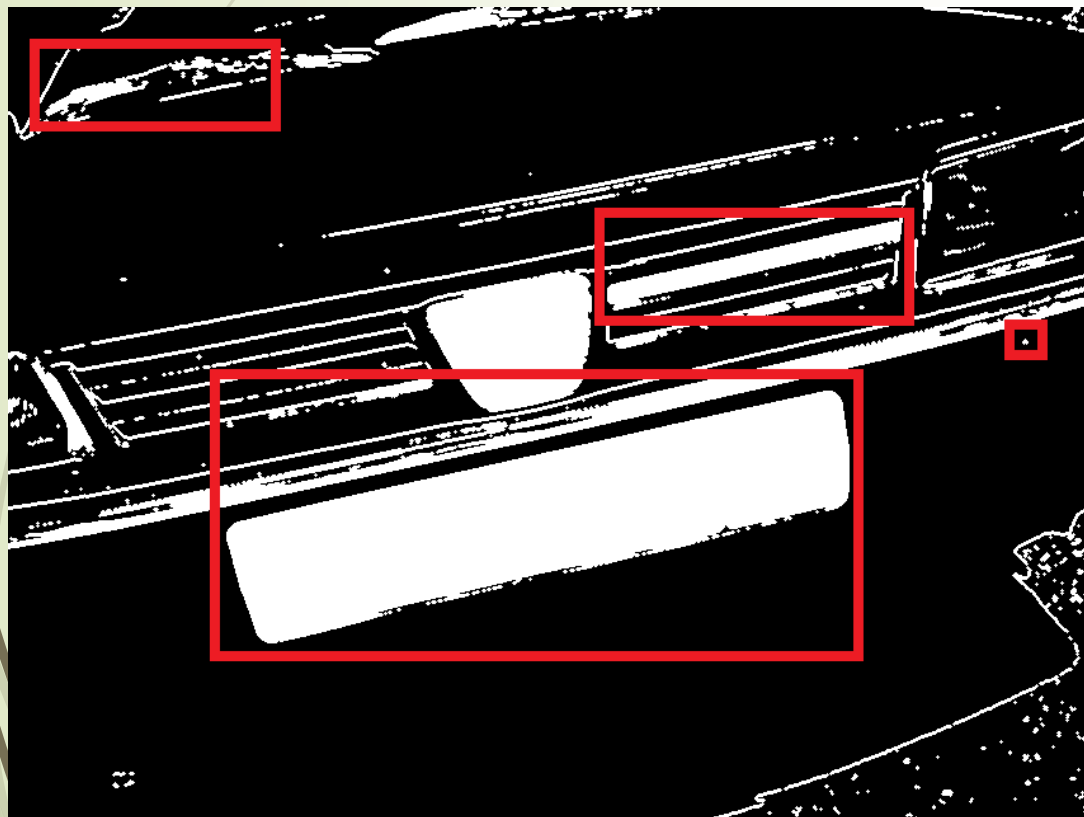
Without threshold/G



With threshold/BW

2 License Plate Detection(LPD)

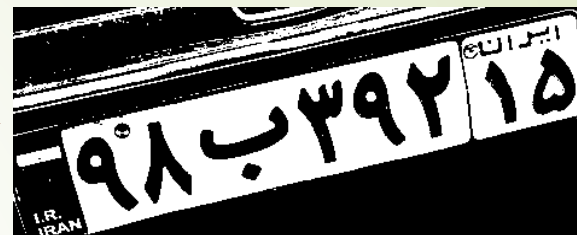
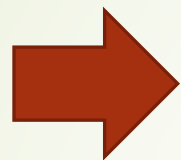
2-4/5 Labelling and Cropping



3 Character Extraction

➤ RGB to grayscale

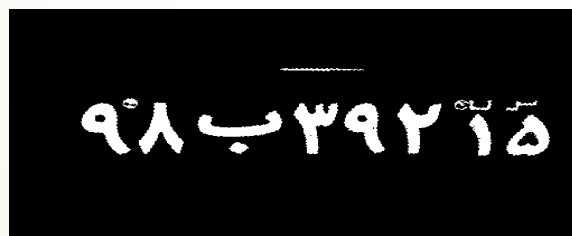
➤ Grayscale to black-white



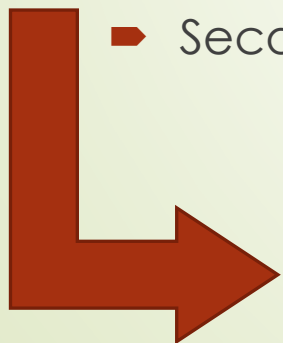
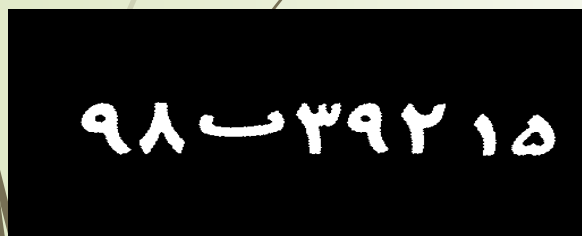
➤ Border removing



➤ First Filter + Rotation

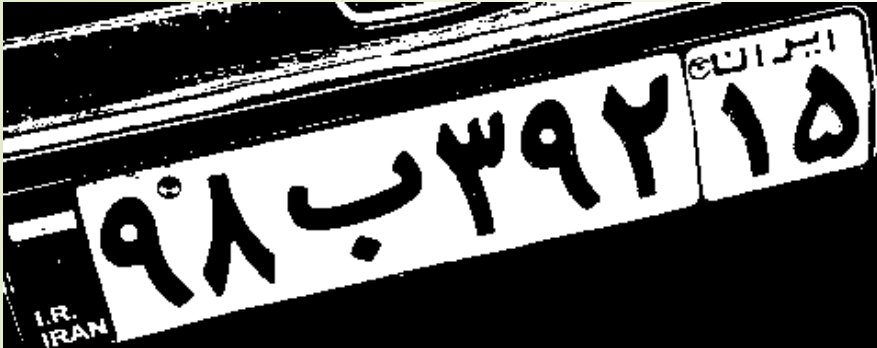


➤ Second and third filter



3 Character Extraction

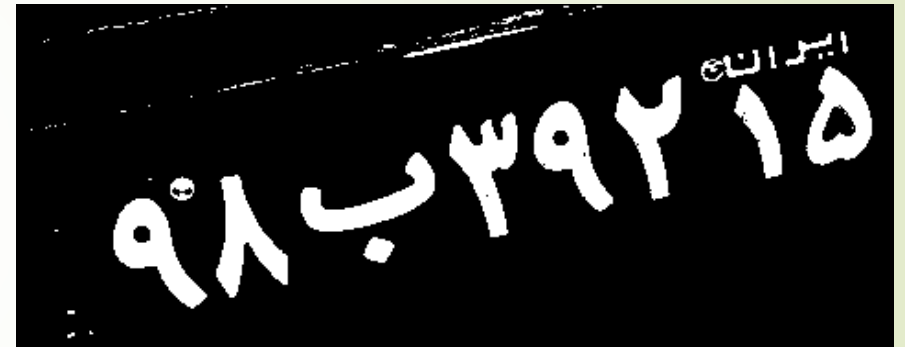
3-2 Border removing



➤ Plate



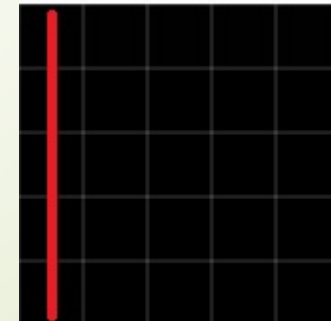
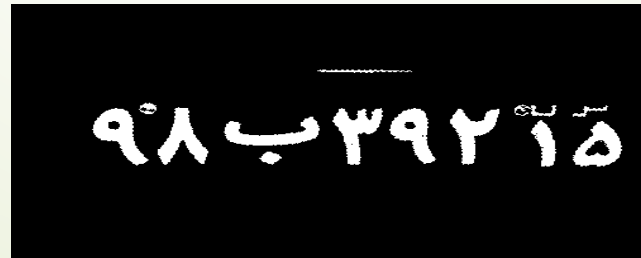
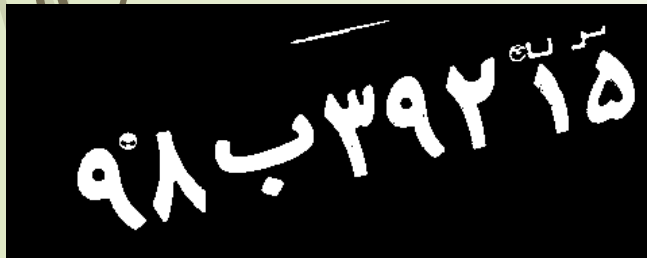
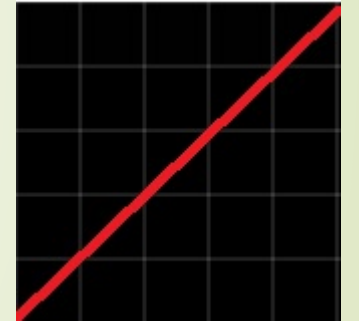
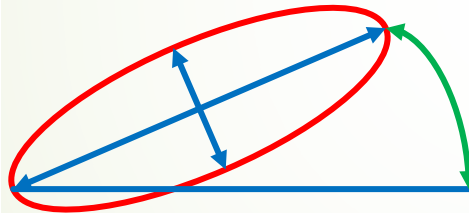
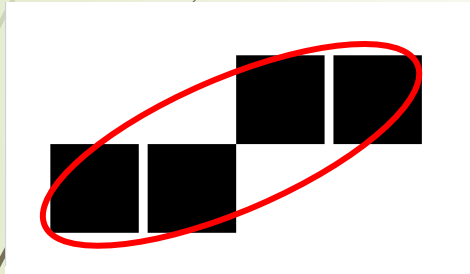
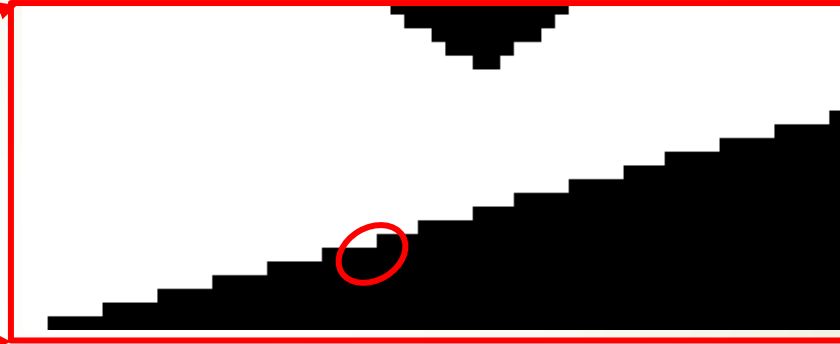
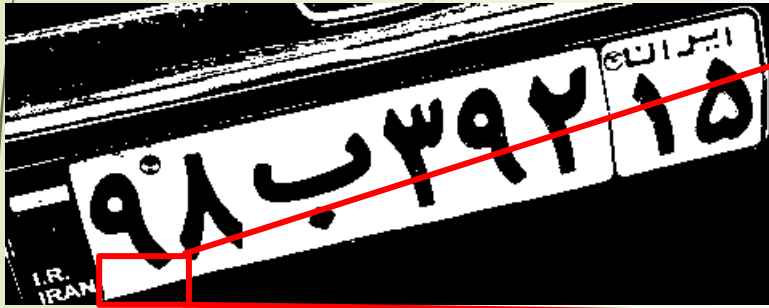
➤ Plate Border



➤ Characters with noise

3 Character Extraction

3-1 Rotation



4 Character Recognition

➤ Plate characters thumbnails



➤ Mini Data Base



➤ Detected plate characters

9 8 B 3 9 2 1 5

5 Pros and Cons

5-1 Errors before plate detection



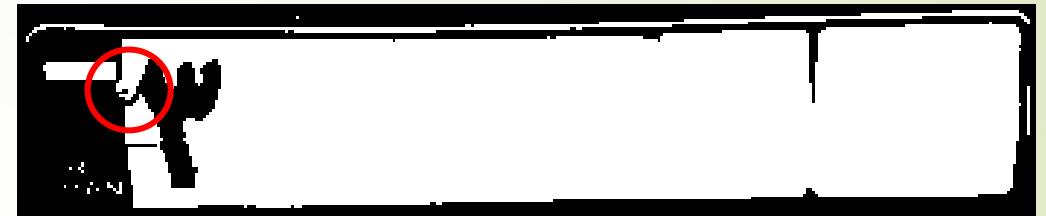
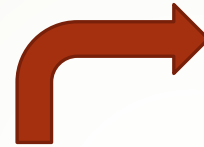
■ Note: Using Neural Network can reduce these kind of errors.

5 Pros and Cons

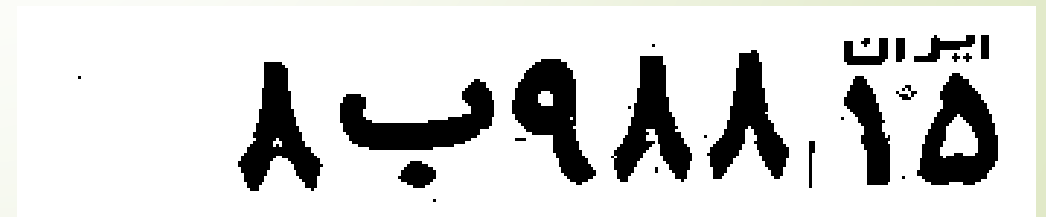
5-2 Errors after plate detection



➤ Plate



➤ Detected border



➤ Missing detected character

5 Pros and Cons

5-3 Plate Enhancement



➤ Plate



➤ With



➤ Without



5 Pros and Cons

5-4 Rotation



→ Plate



→ With

9 8 B 3 9 2 1 5



→ Without

9 8 B 3 9 7 1 5



5 Pros and Cons

5-5 Low quality images



- Note: It's better to use black-white(not gray) images to detect low-quality images (comparing to medium-quality images that it's better to use gray scale ones).