Automatic tire-markings detection & recognition

by Robert-Mihai Lică

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- Extract tire codes, ex: Dot Code, E-mark Code

What do I want to do?

- Uniquely identify a tire
- Extract tire codes, ex: Dot Code, E-mark Code
- Automate the recognition of these codes

Why

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- Integrate with an automatic system for checking the tire integrity

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- Discourage the illegal swappings

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- Integrate with an automatic system for checking the tire integrity
- Discourage the illegal swappings
- Data is power

Image 3

How

How

- Tire unwrapping
- Text region detection
- Character recognition

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Tire unwrapping

- Detect the circles in the image

Tire unwrapping

- Convert to polar coordinates

How

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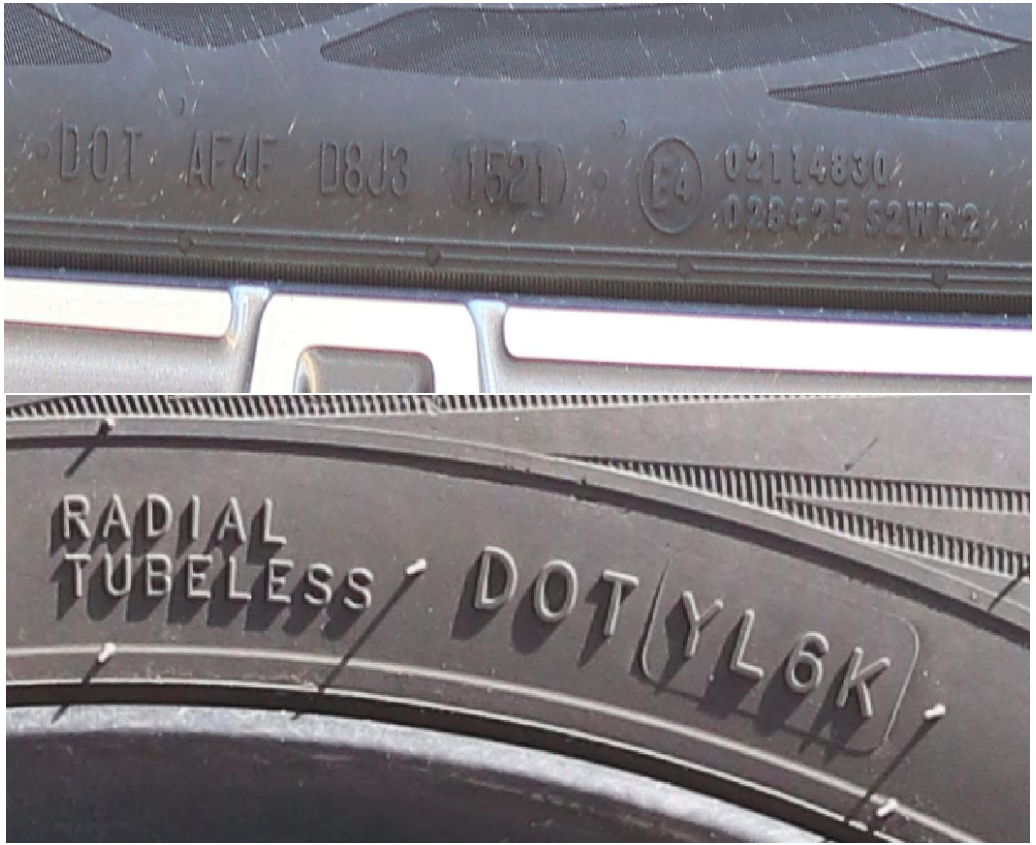
- Text region detection
- Character recognition

Text region detection

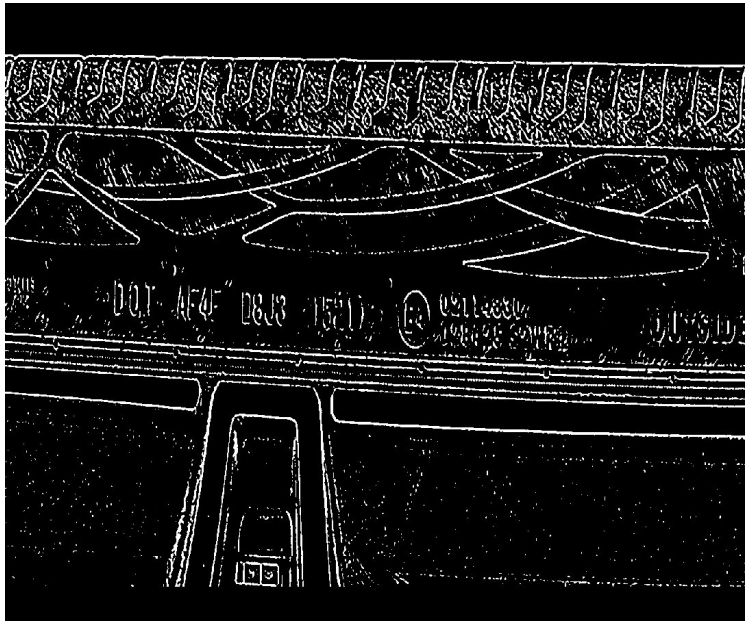
- The text is not very distinguishable from the background
- The tires can have prominent marks
- Noisy input
- Shadows cast by incident light

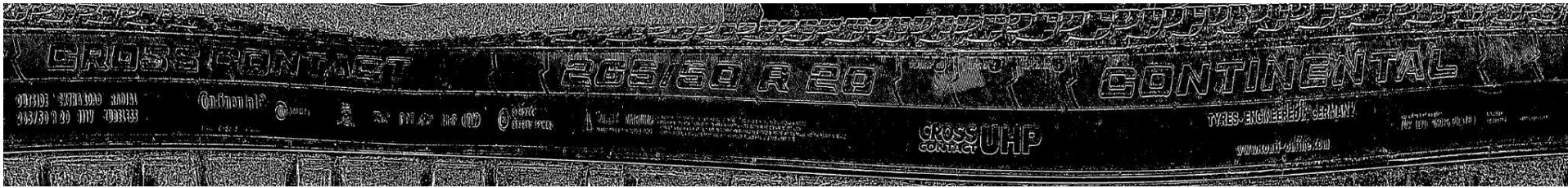


Text region detection

- Proeminent edges are kept by the adaptive thresholding

- Letters are not distinguishable enough





Text region detection

- Segmented the big images in squares

Text region detection

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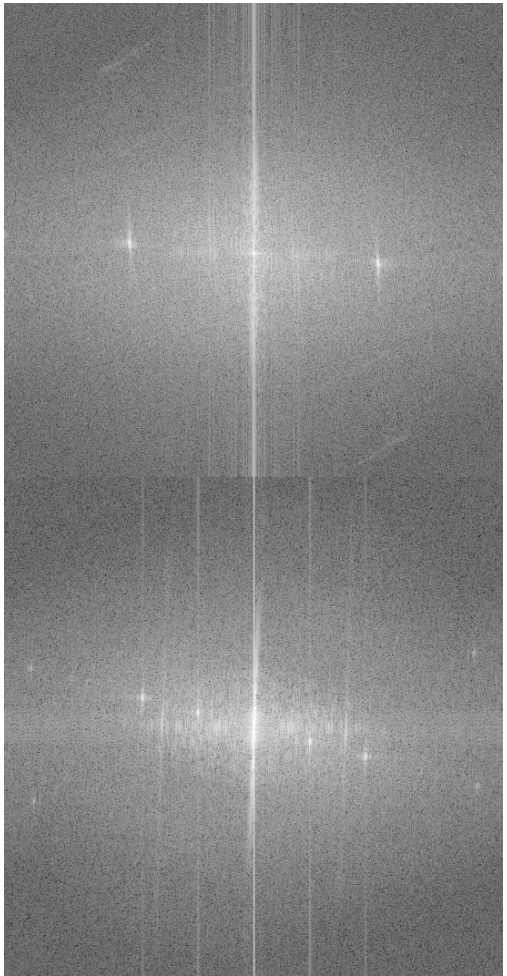
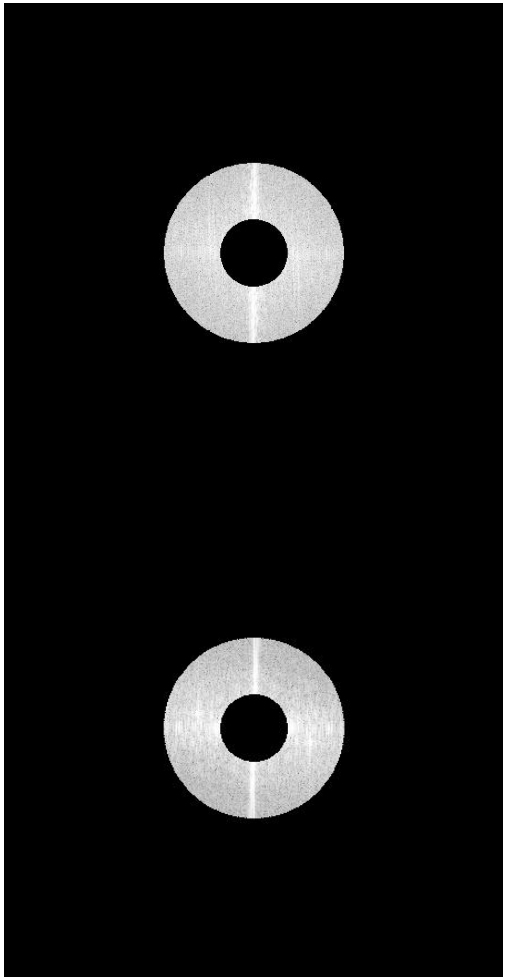
- Passed them into frequency domain



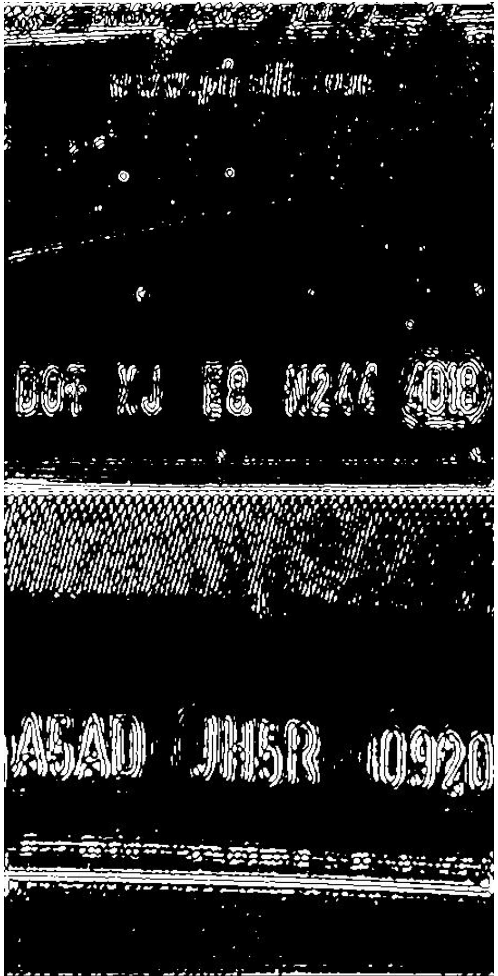
Text region detection

- Segmented the big images in squares
- Passed them into frequency domain
- Created a band pass filter



Text region detection

- Segmented the big images in squares
- Passed them into frequency domain
- Created a band pass filter
- Applied the inverse transform and OTSU thresholding



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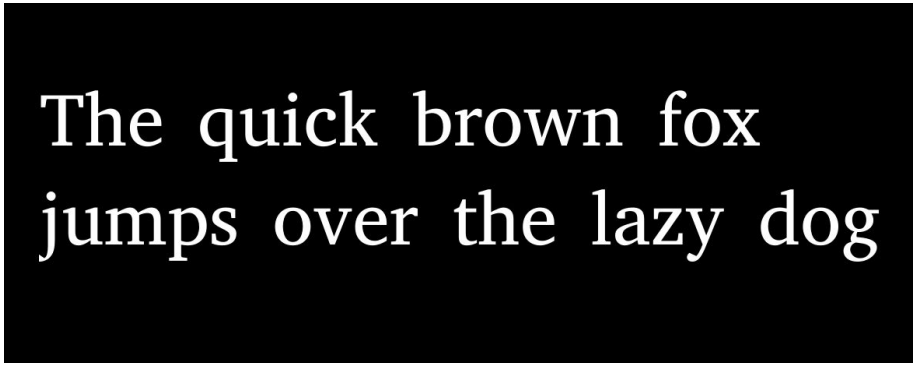
Character recognition

- Optical Character Recognition (OCR)
- Best on binary images
- Will have to test directly on regions of text



Questions & Answers

Thank you

Resources

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