Thesis Title      The Recognition of Car License Plate

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## Abstract

The recognition of car license plate is important for identifying the car because the car license plate has unique information for each car. Because of its uniqueness for the car, the recognition of car license plate requires the method that is accurate and robust to environmental variation. This thesis proposes the recognition of car license plate that is accurate and robust to environmental variation by using car license plate patterns according to motor vehicle regulation and 4 layers backpropagation neural network with supervised learning. In this method, the car images are inputted and binarized. The candidates regions of car license plate are determined according to the car license plate regulation such as color, the ratio and shape of the car license plate, the pattern of characters and numbers etc. Then the windows are opened in the boundaries of candidate regions for recognition of characters and numbers pattern (such as 2 characters following by 4 numbers etc.) For characters pattern recognition in opened windows, firstly, the region of each characters is considered to be cut at the gap between the characters by the patterns from horizontal and vertical projection, and the boundary of each characters/numbers are defined. Then, we normalize each characters in each boundary to 18x13 pixels (234 pixels), and then feed these data into four-layers backpropagation neural

networks for patterns recognition. For the results of recognition by neural networks, the candidate which has characters and numbers according to motor vehicle regulation is certified as license-plate region. Since the results of characters-pattern recognition is used to certify the license plate, the ability of license-plate extraction is more accurate and the car can be identified simultaneously. The experimental results of 70 real car images samples show the performance of car license-plate recognition by 96 percent, and the recognition rate is 92 percent.