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# Bachelor Project Proposal: Vehicle License Plate Detection and Recognition using Color and Edge Information

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This research is aimed at vehicle license plate detection and recognition. In this project, we will try to detect and recognize the license plate numbers (and letters) from images of cars. As the license number is the mandatory identifier of vehicles, the importance of this project lies in its applications in various traffic and security control cases such as border control, road tolling and law enforcement. The main research questions this work tries to answer are: *(i) which combination of image processing techniques makes a reliable car license plate detection and recognition system? (ii) what are the main limits and factors involved in image-processing based vehicle license plate detection and recognition?* The reliability of the system is judged on the basis of license plate extraction, segmentation and recognition of characters.

The requirements of the relevant Bachelor project include a literature review within the discipline, the implementation of relevant code (with the assistance of the provided baseline code), experimentation with benchmarks as well as writing a thesis. We use MATLAB as the main programming language. Throughout this project, we assume images are taken under various lighting conditions and each image only contains one or two cars.

To give a brief overview of the stages that make up the research, we begin with the image pre-processing step to prepare a normalized image for the subsequent processing. Afterwards, a clustering algorithm (i.e. blob analysis) is applied for segmenting and counting cars from the image. Morphological operators are then used for fitting a rectangular shape to the image in order to identify the region containing the license plate. The extracted region is segmented into blocks with the space between adjacent characters enhanced in order to significantly separate the characters making up the license plate into discrete entities. Finally, template matching is employed in order to best fit each character in a segment of the license plate with the alphabet/numerals. The matches with the highest correlation are selected to yield the final result. The number of cars and the bounding boxes is eventually drawn into the original image to display the final results.

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