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Real-Time Motorcycle Image Detection and Histogram Analysis Of Plate Recognition Enhancement

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Abstract. This research investigated of image tracking and edge detection for motorcycle in various lighting and weather conditions. The capability in different resolution also evaluated. The developed framework showed great accuracy in the segmentation of plate number from motorcycle image in daylight condition as compared to rainy daylight and night condition. A benchmark study was conducted to identify fast processing time in the system. MATLAB-Simulink and Xilinx System Generator prototyping environment were selected for designing the detection system. The detection system was implemented on Field Programmable Gate Array (FPGA/hardware) and MATLAB (software). Images were analyzed by comparing the accuracy of bounding box and edges which is displayed in different conditions, different threshold level, different resolutions and different distances. The output image is clear with pixel 1024 x768 in daylight, rainy and night. The performance of image output is drop and blur while used low pixel resolutions such as 640 x 480, 720 x 480 and 800 x 600. Motorcycle plate number is recognized in daylight condition at 5.0 meter. The analysis showed daylight is the best situation in detecting the motorcycle image followed by rainy daylight condition and night. Analysis with Histogram level and contrast stretching method showed performance in hardware is improved rather than software. This project can be applied to improve the visual driver support system in the future.

Keywords: motorcycle, image, fpga, bounding box, edge detection