

ABSTRACT

CONTRAST STRETCHING TO ENHANCE PARKING LOT DETECTION AT NIGHT BASED ON CONVOLUTIONAL NEURAL NETWORK (CNN) AND SUPPORT VECTOR MACHINES (SVM)

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The detection system for parking space is efficient car park guidance systems by improving the system of empty parking lots and the vacant ones at night-time images, to prevent the false detection because of the minimum light distribution in images. The main focus of this research is on how contrast stretching is used to improve image quality by stretching the pixel intensity value that can be significant in night-time parking space images. To succeed the detection of parking space, a machine learning is proposed that help detecting the cars and empty parking space in night-time images by the CNN and SVM algorithm. They are used to do the classification task, then its performance results are compared and evaluated to get better result. After the evaluation of classifier, next was the detection of cars in parking space by using the sliding window search and empty parking space detection using the edge detection to make the bounding box around the object.

The result of the research illustrates the accuracy of CNN and SVM algorithm in different image enhancement. The contrast stretched images had better visualization in the night-time parking space images, and the comparison of accuracy resulted with the method of CNN and SVM in images using contrast stretching and images without contrast stretching by features extraction of HOG. This result also shows that these methods can improve the detection accuracy of cars and parking space, with the highest accuracy was got from the contrast stretched images using CNN model with 99%.

Keywords: CNN, Parking Lot Detection, Contrast Stretching, HOG, SVM, Machine Learning, Image Enhancement