DEEP LEARNING SYSTEM FOR AUTOMATIC LICENSE PLATE RECOGNITION TO TRACK SRI LANKAN VEHICLES WHICH NEEDED OR WITH LEGAL ISSUES

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Abstract

Sri Lanka also in need of support more than manpower to manage and execute legal and safety protocols due to the increasing number of registered vehicles. So this paper presents a deep learning system that able to recognize license plates of vehicles in Sri Lanka that can help Sri Lankan Police Department or any other responsible party. Automatic License Plate Recognition (ALPR) is a popular research area due to its modern applications and also due to limitations in image processing algorithms to satisfy all the real-life hurdles. This proposed system built upon a robust and efficient deep learning method using a combination of two Convolutional Neural Network (CNN) architectures. One for detection and other for character recognition. For training detection model used LP images as a positive images and the other parts of the vehicle as non LP or negative image. For training, the character recognition model used 36 images of digits and characters that are same as the Sri Lankan LP character format. Two applications of ALPR also a part of this research. It includes tracking a particular vehicle from a CCTV video and vehicles with invalid LP or expired revenue license. The Department of Motor Traffic Sri Lanka (DMT) online site is used to check the LP validation and revenue license expiration. For the research, a dataset which contained 300 images of vehicles and the dataset spitted into training and testing data in the ratio of 75:25 respectively. After the testing achieved a 97.33% accuracy of the license plate detection and 95.89% accuracy of character recognition. Also it works well with the videos and were able track the wanted LP numbers and to check the revenue license expiration. So in the simulated environment the proposed method and the research was highly successful.

Keyword: Vehicle tracking, license plate recognition, optical character recognition, convolutional, neural network, machine learning