

Development of Online Vehicle Plate Recognition System

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Abstract--This document describes the development of online vehicle plate recognition system in Universiti Malaysia Pahang. The system is created to capture image of the vehicle plate automatically and display the details of the vehicle owner including their name, staff or student ID number and contact number in an online mode. The system consists of the development of the hardware part to capture and process the image of the vehicle plate. Meanwhile, the software development involved the design of the Graphical User Interface (GUI) to identify the owner of the vehicle based on the image of the vehicle plate. The results of the project have shown that the proposed system has a capability to recognize the vehicle plate and the owner of the vehicle at the accuracy of 76%.

Index Terms--Vehicle Plate Recognition, Vehicle Owner, GUI, and Recognition Accuracy

I. INTRODUCTION

THE recognizer machine becomes interest of researchers in many branches of application technologies including security system and monitoring systems. This system becomes crucial in our daily life because of the unlimited increase of vehicles and transportation systems which make it impossible to be fully managed and monitored by humans with manual operation. Among the applications that really require recognition system are traffic monitoring, tracking stolen cars, managing parking toll, red-light violation enforcement, car park entrance, building entrance and customs checkpoints.

Since the last few decades, the number plate recognition has been developed in the field of security system to detect stolen vehicles and security authorization such as entrance admission, government office and college residential area. However, the limitation of the current system is a real-time vehicle plate recognizer still not widely used in market. For instance, the operation of security system in Universiti Malaysia Pahang is still not efficient and insufficient where they still employ the old version of security checking such as the use of an obsolete vehicle sticker to trigger the guard at the guardhouse to allow the vehicle to enter the university's compound. Thus, it is almost impossible for the security guard to detect and recognize every vehicle entering in and out of the campus for the whole time and meanwhile there are lecturers, students, staffs and even construction workers using the same entrance. Therefore, a development of Online Vehicle Recognition System is proposed to be implemented in Universiti Malaysia Pahang where the system can capture an image of vehicle plate automatically and then perform database matching and finally, identify the authorized vehicle to enter the university's compound.

II. LITERATURE REVIEW

Researchers have invented various methods and systems in detecting vehicle number plate. The first number plate recognition system was invented in 1976 at the Police Scientific Development Branch in the UK [1-3].

Early trial systems were deployed on the A1 road and at the Dart ford Tunnel. However, it did not become widely used until new developments in cheaper and easier to use software were pioneered in 1990 and onward. For last few decades, this branch of technology system has been developed vigorously and many drawbacks from the previous research have been improved. The fundamental of the detection system is the application of optical character recognition (OCR) technique on images to read the characters of the license plates on vehicles [3-6] and this system basically divided into a few different versions where there are offline and online types of system. The offline type of number plate recognition system is not in real time system, where the image of vehicle plate is captured first before it is transferred into the system to be processed. Whereas the online type of number plate recognition system is a real-time processed for the captured image [7, 9-10]. The system is able to capture the image and simultaneously process the image of the vehicle plate. However, both of them have their advantages and disadvantages. The accuracy of the system regardless of the type of the detection system depends on the capability of the system to capture the high quality image of the vehicle plate and the application of image processing technique to analyse the captured image. Several factors that might affect the recognition accuracy are the size of the characters in the number plate, the size of the number plate, the background colour of number plate, light condition, weather condition, type of vehicle and the resolution and position of the camera. In analysing the image of vehicle plate, MATLAB is chosen since it is one of the powerful software and preferable by