

# **CAR PLATE RECOGNITION BASED ON STROKE COMPOSITION TECHNIQUE**



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# 1. Letter of Report Submission

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Tuan,

## **LAPORAN AKHIR PENYELIDIKAN ' CAR PLATE RECOGNITION BASED ON STROKE COMPOSITION TECHNIQUE'**

Merujuk kepada perkara diatas, bersama-sama dengan ini disertakan 3 (tiga) naskah Laporan Akhir Penyelidikan bertajuk 'Car Plate Recognition Based on Stroke Composition Technique' dari Fakulti Kejuruteraan Elektrik, Pulau Pinang unruk makluman pihak tuan.

Sekian, terima kasih.

Yang benar,

**SAMSUL BIN SETUMIN**  
Ketua  
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## 5. Report

### 5.1 Proposed Executive Summary

In this research, a license plate recognition algorithm using a stroke analysis will be done. Stroke analysis is a method of character recognition that is most commonly used in recognition of oriental handwritten characters using languages such as Japanese, Chinese and Korean. This technique identifies the various strokes that combine to form a particular character and based on that a conclusion is made. Stroke analysis involves the study of a common representation scheme to provide a structure hierarchy for different characters, whose most primitive building blocks are strokes.

Stroke analysis is a popular method used in recognition of Chinese, Japanese and Korean characters mainly because the characters in these languages comprise of combining strokes to form a particular character. Besides, these characters are rather complex. Thus, strokes analysis in these characters would be the best method for carrying out recognition in terms of accuracy and speed compared to other techniques such as neural networks and template matching. Generally, strokes can be divided into two groups. The two groups are simple strokes and complex strokes.

There are many synonymous terms with stroke analysis. Some of the terminologies which have the same meaning with strokes analysis are chain coding, stroke approximation and boundary representations. Many researches have proposed various different approaches at carrying out stroke analysis in the process of character recognition. These different approaches are customized for their various applications. In this algorithm however, it comprises two main processes; character extraction and stroke analysis. In addition, the stroke analysis itself generally consists of two parts. These two parts are stroke tracing and stroke recognition.

Although stroke analysis is a powerful technique in the recognition of characters, it is a rather difficult and complicated technique to be implemented. The biggest challenge posed by the usage of this technique is that of extracting the strokes from the character images. Extracting the strokes from the image of a character is a complicated task. As such, various researchers have proposed various different approaches for obtaining strokes from the character image.

## **5.2 Enhanced Executive Summary**

The Road Transport Department of Malaysia has endorsed a specification for vehicle plates that includes the font and size of characters that must be followed by car owners. However, there are a special plate number where this specification is not followed such as Proton, BAMbee, Putrajaya, Tiara, Satria and Perodua. This will cause problems in the recognition phase because existing systems will find difficulty in recognizing these plates. Therefore, this project is aimed of an implementing a recognition system that is capable of solving the mentioned issues using stroke analysis technique. The system is an offline system where the vehicle image is loaded manually from a directory. The loaded image is then pre-processed using image processing techniques. Consequently, the image is converted into a binary image. The plate region is extracted prior to characters extraction. All the characters then undergo thinning process before stroke analysis performs tracing and recognition of the characters. The system displays the output in readable text. The performance analysis has shown that the system is able to recognize Malaysian vehicle plate with more than 95 percent accuracy.