

Universiti Teknologi MARA

**Malaysian License Plate Number
Detection Based On Sobel Vertical Edge
Algorithm**

Siti Nor Azimah Binti Ibrahim

**Thesis submitted in fulfillment of the requirements for
Bachelor of Computer Science (Hons)
Faculty of Information Technology And
Quantitative Science**

Mei 2007

DECLARATION

I certify that this thesis and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline

Mei, 2007

Siti Nor Azimah bt Ibrahim

2005614659

ABSTRACT

Transportation is the most important in daily live. Nowadays people use verity of transportation either on the road, air or water. Recently, in Malaysia the use of vehicles has been increased because of the population growth and human needs. Furthermore, Malaysian had been produced many types of vehicles to be used. Therefore, the control of vehicles is become more complex and much more difficult to solve.

A License Plate Recognition (LPR) System is one kind of Intelligent Transport systems and is of considerable interest because of its potential applications to areas such as highway electronic toll collection, Traffic Monitoring System and so on. The system captures the images of the vehicles with a digital camera. An algorithm for the detection of license plate has been designed and an algorithm for filter the detected edge is proposed for future process which is plate number extraction

This project describes the method used by a computer to convert digital images of vehicles license plate into electronic text. Sobel Vertical Edge Algorithm approach will be used in order to detect the license plate number from digital image as well as some experimental result to filter the detected edge of license plate successfully.

Table of Contents

| | |
|--|------|
| DECLARATION | ii |
| ACKNOWLEDGEMENT | iii |
| ABSTRACT | iv |
| APPROVAL..... | v |
| TABLE OF CONTENT | vi |
| LIST OF FIGURE..... | viii |
| CHAPTER 1 : INTRODUCTION | 1 |
| 1.0 Introduction..... | 1 |
| 1.1 Problem Description..... | 1 |
| 1.2 Project Objectives | 2 |
| 1.3 Project Scope..... | 2 |
| 1.4 Expected Outcomes and Deliverables | 2 |
| CHAPTER2 : LITERATURE REVIEW | 3 |
| 2.0 Introduction..... | 3 |
| 2.1 What is Image Processing? | 3 |
| 2.2 License Plate Number (LPR) System | 4 |
| 2.3 Edge Detection..... | 6 |
| 2.4 Sobel Detector..... | 10 |
| 2.4.1 Sobel vertical edge algorithm..... | 11 |
| 2.5 Advantages of Sobel Detector..... | 12 |
| 2.6 Conclusion | 13 |
| CHAPTER 3: PROJECT METHODOLOGY | 14 |
| 3.0 Introduction..... | 14 |

| | | |
|--|--|-----------|
| 3.1 | Project overview..... | 14 |
| 3.2 | Knowledge Gathering | 16 |
| 3.2.1 | Information Gathering..... | 16 |
| 3.2.2 | Data Collection..... | 16 |
| 3.2.2.1 | Type of Data | 17 |
| 3.3.2.2 | Data Collection Instrument | 17 |
| 3.3.2.3 | Condition/Situation of Data Collection..... | 18 |
| 3.3 | Hardware and Software Requirement | 18 |
| 3.4 | Project Design | 18 |
| 3.4.1 | Flow Chart of Extraction Process | 19 |
| 3.4.2 | Project model | 20 |
| 3.4.3 | Project Framework..... | 21 |
| CHAPTER 4 : PROJECT IMPLEMENTATION..... | | 22 |
| 4.0 | Sobel algorithm to detect Vertical edges | 22 |
| 4.1 | Sobel matrix / Sobel Mask | 22 |
| 4.2 | Program procedures: | 24 |
| CHAPTER 5 : RESULT AND ANALYSIS..... | | 27 |
| 5.0 | Introduction..... | 27 |
| CHAPTER 6 : CONCLUSION..... | | 28 |
| 6.0 | Conclusion | 28 |
| 6.1 | Recommendation..... | 28 |
| REFERENCES | | |
| APPENDIX | | |