



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**SMART DISPLAY FOR BUS ARRIVING MANAGEMENT
SYSTEM BASED ON VISION SYSTEM**

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Engineering Technology (Industrial Electronics) (Hons.)

by

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SUPERVISOR DECLARATION

“I hereby declare that I have read this thesis and in my opinion this report is sufficient in term of scope and quality for the award of degree of Bachelor Degree of Engineering Technology (Industrial Electronics with Hons.)”.

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PENGESAHAN PENYELIA

“Saya akui bahawa telah membaca laporan ini dan pada pandangan saya laporan ini adalah memadai dari segi skop dan kualiti untuk tujuan penganugerahan Ijazah Sarjana Muda Teknologi Kejuruteraan (Elektronik Industri dengan kepujiaan)”.

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DECLARATION

“I hereby declare that the work in this report is my own except for summaries and quotations which have been duly acknowledged”.

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DEDICATION

To my father & my mother,

Mr Hj Othman bin Hj Siron & Mrs Hjh Hasebah bt Hj Abd Samad

All my friends and relatives

All the lecturers especially Mr Shahrizal bin Saat

Thousand thank and appreciate for your support,

Encouragement and understanding

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ABSTRACT

Lack of appropriate information system for transportation, particularly for passengers who use public transport, specifically buses for commuting is causing lot of anxiety among the commuter. Passengers wait for long time at the bus terminus expecting the bus to arrive as per the schedule. At present there is no such system in place for the benefit of the passengers who take buses for commuting. It would be good to have such a system like in railway stations which provide information about the arriving and departing trains. We propose a system which could track the current position of buses and the dynamic arrival and departure time and inform the passengers via display boards at the terminus. It has a camera that can capture the image of bus and display the current information to customer. This project used Visual Basic to display the information to customer. Beside that this project will show the history of the previously trip destination.

ABSTRAK

Kekurangan sistem maklumat yang sesuai untuk pengangkutan awam, khususnya bagi para penumpang yang sering menggunakan pengangkutan awam, seperti pengguna bas untuk berulang-alik menyebabkan banyak kebimbangan di kalangan penumpang bas. Penumpang terpaksa menunggu lama di perhentian bas dan menjangkakan bas akan tiba seperti yang dijadualkan. Pada ketika ini, tiada sistem di terminal bas yang boleh memaparkan maklumat mengenai ketibaan dan perlepasan bas dari terminal. Ia akan menjadi lebih baik sekiranya mempunyai sistem seperti ini. Ini kerana sistem seperti ini pernah digunakan di stesen kereta api yang mana sistem ini menyediakan maklumat tentang kereta api yang tiba dan berlepas dari terminal. Kami mencadangkan satu sistem yang boleh mengesan kedudukan semasa bas seperti ketibaan dan perlepasan bas di terminal bas dan memaklumkan kepada penumpang melalui papan paparan di terminal itu. Ia mempunyai kamera yang boleh mengambil gambar bas dan mempamerkan gambar bas tersebut bersama maklumat terkini bas tersebut. Projek ini menggunakan perisian visual basic untuk mempamerkan maklumat tersebut. Selain itu juga, projek ini akan mempamerkan maklumat bus yang terdahulu di bahagian sejarah bus di perisian visual basic.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

LCD – Liquid Crystal Display

OCR – Object Character Recognition

SDK – Software Developments Kits

MODI – Microsoft Office Documents Library

ADI – Application Developments Interface

TIFF – Tagged Image Fie Format

TTS – Text to Speech

GUI – Graphic User Interface

ALPR - Automatic license plate recognition

CHAPTER 1

INTRODUCTION

This chapter will describes the introduction of Smart display for arrive of bus system management based on vision system project. This chapter also provide the problem statements, objective and the project scope.

1.1 Preface

Public transport has become a part of live. Most people reach from homes to workplace or school using public transportation. People can lose their time in transportation because of undesirable waiting without the information of bus. People also have the right to know where the bus is now and the time that bus will departure. There are a kinds of service that all public transport systems must provide especially public bus.

- i. Bus schedule information
- ii. Trip of bus destination
- iii. History of bus trip information

1.2 Problem Statement

Nowadays, Malaysia is one of the countries that use public transport. Malaysian used the public transport to go workplace, school or back to village. Mostly this public transport frequently is used at holiday season and the festival season. Beside in weekdays at the morning also the peak time for the worker and student used this public transport to go workplace and school. At this time, public transport is quite busy and that time also have some issue that the management of public transport company will make some mistake at their trip destination of bus schedule. Every day, bus will arrive or departure at the terminal as the described schedule but some of bus will arrive departure very late depend on the situation such as the technical problem, weather problem and management problem. In this problem, public transport company must have the system that can display the time and detail about the trip of destination of the bus that arrive and departure at that terminal. The public transport company also must always updated the detail about the bus according to the current situation. Besides that, some issue will come out such as the passenger will spent their time to wait the bus coming at that terminal without know anything about the bus details. This undesirable waiting will make unsatisfied of the passenger for the public transports company services. This issue will defame the public transport company.

1.3 Objective of the study

The main purpose of this project is to solve the problem that confront for customer and public transport company in terminal bus. In particular, the objective of this study is:

- i. Able to show the information of bus data using visual basic
- ii. Able control stepper motor using PIC18F4550
- iii. To provide information to passenger on time of arrival or departure

1.4 Scope of the study

The research aim is to solve the problem that confront for customer and public transport company in terminal bus. To obtain the research objective, a few scope of this project has identified and the elements are;

- i. 3 bus parking lot is used to know the arrival of bus
- ii. Use visual basic to create the graphic user interface (GUI) for inform the information about the bus

CHAPTER 2

LITERATURE REVIEW

INTRODUCTION

This chapter explained the theory and concept that has been used during the research. The theories are such as Image Processing, Object Character Recognition (OCR), Microsoft document imaging 2013 (OCR engine), Automatic license plate recognition (ALPR) and Visual basic software.

2.1 Definition of image processing

Image processing can be defined as analysis of picture using techniques that can basically identify shades and colors. It deals with images in bitmapped graphic format that have been scanned or captured with digital camera. It also means image improvement, such as refining a picture in a program or software that has been scanned or entered from a video source or in short, image processing is any form of information processing when both the input and output is images. Image processing is divided into two major branches; image enhancement and image restoration. Image enhancement is to improve the quality of image or emphasize particular aspects within image and to produce image that is different from the original. Whereas image restoration, is to recover the original image after degraded by known effects such as geometric distortion within camera system. Image processing does not reduce the amount of data present but rearranges it.

2.2 Image processing functions/algorithms

Image processing applications mainly focus on improving the visual appearance of images to a human viewer and preparing for measurement of the features and structures present. For visual enhancement, the familiarity with the human visual process and an appreciation of what cues the viewer responds to is important. Since many images are processed in the context of reproduction or transmission, printing and display process are included in one of the vital elements. The measurement of images generally requires that features be well defined, either by edges or unique brightness, color, texture, or some combination of these factors. It was also learned that real time imaging systems were used in important application domains, including industrial, medical and national defense. The real time imaging will then be processed in many stages. It will be preprocessed, processed and post processed to produce the image in its desired quality and resolution. An image is an array, or a matrix, of square pixels (picture elements) arranged in columns and rows.

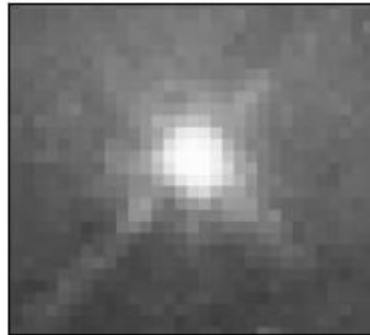


Figure 2.1: An image — an array or a matrix of pixels arranged in columns and rows.

In a (8-bit) greyscale image each picture element has an assigned intensity that ranges from 0 to 255. A grey scale image is what people normally call a black and white image, but the name emphasizes that such an image will also include many shades of grey.

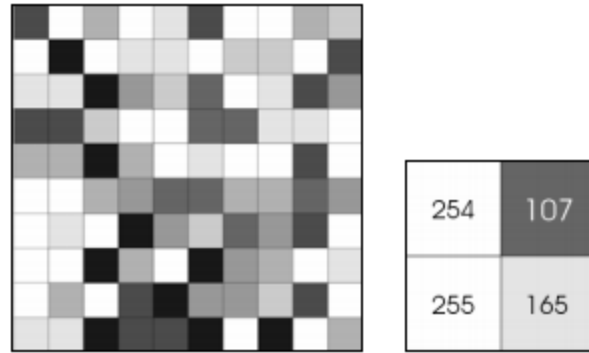


Figure 2.2: Each pixel has a value from 0 (black) to 255 (white).

The possible range of the pixel values depend on the color depth of the image, here 8 bit = 256 tones or greyscales. A normal greyscale image has 8 bit color depth = 256 greyscales. A “true color” image has 24 bit color depth = $8 \times 8 \times 8$ bits = $256 \times 256 \times 256$ colors = ~16 million colors.

2.3 Object Character Recognition (OCR)

Object Character Recognition (OCR) is a technology that used to translate scanned image of text into computer editable and searchable text. OCR software is a technology are analytical intelligent system that consider only sequence of character rather than whole words or phrases data during the recognition process. Based on analysis of sequential lines and curves, OCR make the best guesses at character using database look-up tables to closely associate or match the string of character that from word.

Character recognition is an art of detecting segmenting and identifying characters from image. More precisely Character recognition is process of detecting and recognizing characters from input image and converts it into ASCII or other equivalent machine editable form. It contributes immensely to the advancement of automation process and improving the interface between man and machine in many applications. Character recognition is one of the most interesting and fascinating areas of pattern recognition and artificial intelligence. Character recognition is getting more and more attention since last decade due to its wide range of application. Conversion of handwritten characters is important for making several important documents related to our history, such as manuscripts, into machine editable form so that it can be easily accessed and preserved. Lot of independent work is going on in Optical Character Recognition that is processing of printed/computer generated document and handwritten and manually created document processing i.e. handwritten character recognition. Character recognition process can be classified in two categories.