



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

OPTICAL CHARACTER RECOGNITION USING

TEMPLATE MATCHING

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronic Engineering Technology (Telecommunication) with Honours.

by

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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunication) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Projek ini dapat memberi manfaat kepada Fakulti Teknologi Kejuruteraan Elektrik dan Elektronik (FTKKEE), UTeM. Tajuk bagi projek ini ialah mengenal pasti perkataan menggunakan templat yang sepadan. Sistem ini diubah suai bagi memenuhi keperluan pengguna. Oleh itu, projek ini bertujuan untuk membina sistem yang dapat mengesan perkataan dalam dokumen yang diimbas. Kaedah ini dapat dikemaskini melalui projek ini dengan menggunakan templat yang sepadan tetapi ia hendaklah menghubungkan dengan menggunakan rangkaian Matlab. Penggunaan padanan templat boleh meningkatkan kualiti pengecaman perkataan disamping mencapai prestasi pengecaman yang baik. Dengan menggunakan perisian ini, ia membantu pengguna untuk membaca apa-apa jenis dokumen yang diimbas dengan jelas tanpa sebarang kabur.

ABSTRACT

This project is useful for the Faculty of Technology in Electric and Electronic (FTKKEE), UTeM. The project title is optical character recognition using template matching. The system is developed to meet the community needs. Therefore, this project is intended to develop a system that is able to detect text in the scanned document. The method used in completing this project is template matching but it is implemented using MATLAB software. The use of template matching can improve the quality of recognition while achieving good performance. By using this software, it helps user to read any types of scanned documents clearly without any blurry.

DEDICATION

ALHAMDULILLAH.
TO MY PARENTS,
PUAN NOLEE BINTI MOHD MAKSOM
AND MY LATE FATHER MD NOOR BIN SALEH
FOR EVERYTHING.

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TABLE OF CONTENTS

	PAGE
TABLE OF CONTENTS	x
LIST OF TABLES	xiv
LIST OF FIGURES	xv
LIST OF APPENDICES	xviii
LIST OF ABBREVIATIONS	xix
CHAPTER 1 INTRODUCTION	1
1.0 Project Background	1
1.1 Problem Statement	1-1
1.2 Objective	1
1.3 Scope	1
CHAPTER 2 LITERATURE REVIEW	3
2.0 Introduction	3
2.1 Past Related Project Research	3
2.1.1 A video Text Detection and Recognition System	3-5
2.1.2 A method for Text Localization and Recognition in Real-World Images	6
2.1.3 A Data Base for Arabic Handwritten Text Recognition Research	6-8
2.1.4 Top-Down and Bottom-up Cues for SceneText Recognition	9-10

2.1.5	On Combining Multiple Segmentation in Scene Text Recognition	10-11
2.1.6	Writing Speed Normalization for On-Line Handwritten Text Recognition	11-12
2.1.7	Detection and Recognition of Text from Image Contrast and Edge Enhanced MSER Segmentation and OCR	12-14
2.1.8	An End-to-End Trainable Neural Network for Image-Based Sequence Recognition and Its Application to Scene Text REcognition	15-16
2.1.9	WordSup: Exploiting Word Annotations for Character based Text Detection	16-17
2.1.10	Learning to Super-Resolve Blurry Face and Text Images	17-18
2.1.11	Strokelets: A Learned Multi-Scale Representation for Scene Text Recognition	18-19
2.1.12	EAST: An Efficient and Accurate Scene Text Detector	19-20
2.2	Comparison between articles	20-21
CHAPTER 3	METHODOLOGY	22
3.0	Introduction	22
3.1	Methodology Process	22
3.2	MATLAB	23
3.2.1	What is MATLAB?	23
3.3	Flowchart of The Project Planning	24-25

3.4	Block Diagram	25
3.5	Flowchart Represent Process of Project	26
3.5.1	File / Scan	27
3.5.2	Read The File	27
3.5.3	Determine Threshold	27
3.5.4	Binarize The Image	27
3.5.5	Line Segmentation	27
3.5.6	Word Segmentation	27
3.5.7	Character Segmentation	27
3.5.8	Feature Extraction	28
3.5.9	Optical Character Recognition	28
3.5.10	Recognize Character	29
3.6	Coding for the process	28-31
3.7	Template Matching	31-32
CHAPTER 4 RESULT & DISCUSSION		33
4.0	Introduction	33
4.1	Result simulation	33
4.1.1	Result of text with Jpeg format	33-34
4.1.2	Result of text with Bitmap format	34

4.1.3	Result of text with Png format	35
4.2	Result analysis	36
4.3	Discussion	36-37
CHAPTER 5	CONCLUSION & FUTURE WORK	38
5.0	Introduction	38
5.1	Conclusion	38
5.2	Further work	38
REFERENCES	39 - 40	
APPENDIX	42	

LIST OF TABLES

TABLE	TITLE	PAGE
Table 2.1:	The Final Detection of Tect Blocks.	5
Table 2.2:	The Most Word That Used in Written Arabic	8
Table 2.3:	Comparative Analysis for Text Detection Stage	13
Table 2.4:	Result Analysis of Proposed Method Using Different Image Frames	14

LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 2.1:	Stages of The Proposed Method	6
Figure 2.2:	The Pre-Processing Operations.	7
Figure 2.3:	Example of Text With Different Font	9
Figure 2.4:	Bi-gram vs Node-Specific Prior	10
Figure 2.5:	Overview of The Method	11
Figure 2.6:	The Flowchart of Propose Algorithm	13
Figure 2.7:	The Network Architecture	16
Figure 2.8:	Visual Hierarchies Under Different Scenarios for Different Language Texts	17
Figure 2.9:	Step of Processing The Input Blurry Image To A Clear Structure and Fine Detail Image	18
Figure 2.10:	Typical Issues Encountered in Character Identification	18
Figure 2.11:	Samples of Character Recognition On The ICDAR 2003 and SVT Dataset	19
Figure 2.12:	Qualitative Results of The Proposed Algorithm	20
Figure 3.1:	Flowchart of Planning Project	24
Figure 3.2:	Block Doagram of The Project	25

Figure 3.3:	Flowchart of Project Development	26
Figure 3.4:	The Neural Network Architecture	28
Figure 3.5:	The Process of Activation The Finction In A System	29
Figure 3.6.1:	The coding for declare the input image	28
Figure 3.6.2:	The coding for convert red green blue image to grayscale	28
Figure 3.6.3:	The coding for maintain the same value after through grayscale process	29
Figure 3.6.4:	The coding for remove all object containing fewer than 15 pixels	29
Figure 3.6.5:	The coding for open file to read	29
Figure 3.6.6:	The coding to identifying the letters	30
Figure 3.6.7:	The coding for detect the space that appear in the coding	31
Figure 3.6.8:	The coding for closed the file that has been open	31
Figure 3.7.1:	shows the hidden layer outputs a vector that grips arrangement data about the image and is used in the template matching algorithm as the features of the image	32
Figure 4.1.1.1:	The coding with jpg input	33
Figure 4.1.1.2:	The input image that been read	33
Figure 4.1.1.3:	The result after run the coding	34
Figure 4.1.2.1:	The coding with bitmap input	34
Figure 4.1.2.2:	The input image that been read	34
Figure 4.1.2.3:	The result after run the coding	34
Figure 4.1.3.1:	The coding with png input	35
Figure 4.1.3.2:	The input image that been read	35
Figure 4.1.3.3:	The result after run the coding	35

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
Appendix 1	Gant Chart for PSM 1	42
Appendix 2	Gant Chart for PSM 2	42

LIST OF ABBREVIATIONS

OCR	Optical Character Recognition
GAN	Generative Adversarial Network
MSER	Maximally Stable Extreme Regions

CHAPTER 1

INTRODUCTION

1.0 Project Background

Optical Character Recognition (OCR) is method of identifying text or sentences from scanned documents or handwritten. From this method, the experimental results indicate that it increased precision in optical recognition for example handwritten recognition (N. Ventaka Rao et al 2016). OCR systems identify character from scanned documents that have been scanned using scanner and inverted them into ASCII data. OCR has three stages which are document scanning process, recognition process and verifying process. At the first stage, the handwritten or printed documents were scan using a scanner. The reliability of the document scanned depends on the scanner. A high-speed and colour value scanner is therefore beneficial. The recognition method involves a few complex algorithms and previous loaded templates and reference books that are verified through the document characters and the consistent ASCII editable machine characters. Human intervention operates the identification either periodically or sequentially (Pranob K Charles et al 2012).

To recognize from any text multimedia such as image, audio and video, optical character recognition can be enforced. Automatic recognition of multimedia is based on the implementation for computer vision and variation recognition. In order to fix the image problem, we may use image processing, character positioning, character segmentation, neural network for text recognition (Karishma Tyagi et al 2014).

1.1 Problem Statement

In recent years, many applications need offline handwriting systems, which include mail categorization, bank processing, document reading and postal address recognition, bank checking. Every process needs to be done by using computer such as working under postal service. Every mail that have been received need to be decoded and

delivered every single day with amount something like 30 million handwritten envelopes. The challenges are when the envelope has to be scanned and the document is not clear after the scanning process has been done. Unless the document is clear, the computer system cannot read it accurately.

Having a text recognition can help to solve the problem because it is a device that everyone can used. It also can make things easier for everyone that needs this device in their daily life.

1.2 Objective

The purpose of this project is:

1. To recognize the characters in image format.
2. To improve the quality of text recognition system using optical character recognition.
3. To study the performance of optical character recognition.

1.3 Scope

The scope of this project is to detect text or character in the scanned document. Besides that, human can communicate with computer using text recognition. It also helps everyone to choose the best technique for the accuracy of the system and make it easier. In order to do that, there's some process need to be followed which include image acquisition, threshold, segmentation, feature extraction and lastly, post processing. With all of this procedure, the scanned document can be read accurately.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

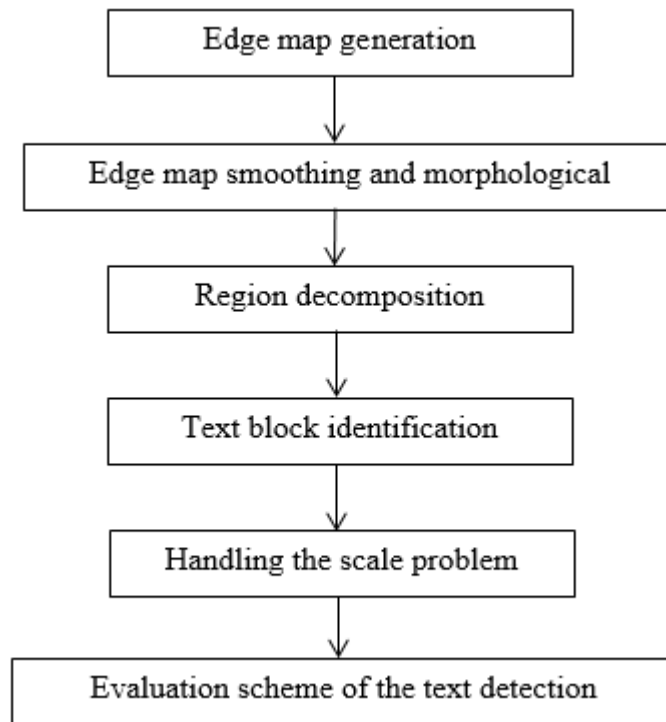
Throughout this segment, the literature reviews of the related project will be presented and elaborated. This chapter also will cover about the study and idea based on the preceding as well as the concept to accomplish this project. The method use for the task will be explaining every section in details.

2.1 Past Related Project Research

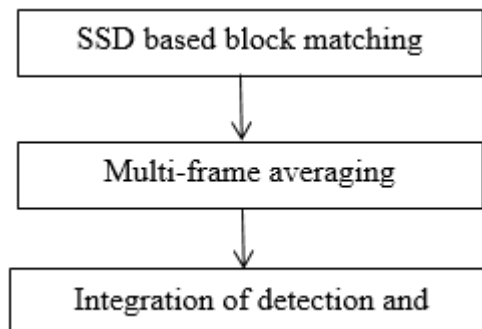
2.1.1 A Video Text Detection and Recognition System

This paper is written by Jie Xi, Xian-Sheng Hua, Xiang-Rong Chen, Liu Wenyin, Hong-Jiang Zhang (2015) proposed a new method that eliminate text information from news videos. First, a technique that combines text detection and text tracking is existing to detect text areas in key frames (images) along with a scheme to calculate this approach's performance. Next process is increase the quality of the spotted text blocks by multi-frame averaging to obtain better recognition results. Lastly, we apply an adaptive thresholding technique to binary text blocks and use an off-the-shelf OCR module to recognize the text. The proposed system's detection and recognition rate is 94.7% and 67.5% respectively.

The first method is text detection. There are 6 steps for text detection.



Second method is text tracking. Text tracking consists 3 steps.



The third method is binarization and recognition. There's 3 step in this method.

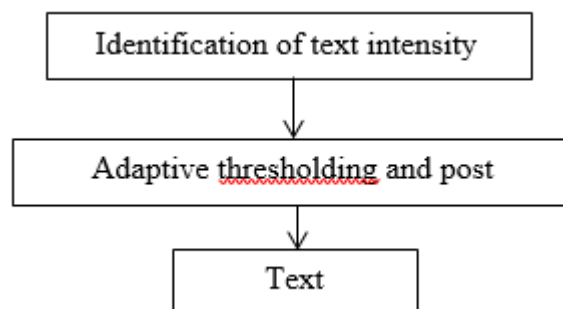





Table 2.1: The final detection of text blocks.

	<p>Process smooth out and original formed a region.</p>
	<p>Region decomposition generates candidate text blocks.</p>
	<p>Description of text blocks.</p>