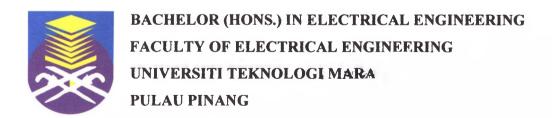
MOVING OBJECT RECOGNITION USING BACKGROUND SUBTRACTION

MUHAMAD SHUKRI BIN ABU HASSAN

A report submitted to the Faculty of Electrical Engineering, Universiti Teknologi MARA in partial fulfillment of the requirement for the Bachelor of Engineering (Hons) Electrical.

NOVEMBER 2008



DECLARATION
It is hereby declared that all the materials in this thesis are the result of my own work and all the materials, which are not result of my own work, have been clearly acknowledged in this thesis.

TABLE OF CONTENTS

	PAGE
DECLARATION	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS	v
LIST OF FIGURES	viii
LIST OF TABLES	ix
ABBREVIATIONS	ix
CHAPTER 1	
INTRODUCTION	
1.1 Background	1
1.2 Objectives	2
1.3 Scope of work	2
1.4 Thesis Outline	3
CHAPTER 2	
LITERATURE REVIEW	
2.1 Introduction	4
2.2 Moving Object Recognition	4
2.3 Comparison Of Moving Object Recognition	6
Methods	
2.3.1 Frame Differencing	6
2.3.2 Moving Average Filtering	7
2.3.3 Background Subtraction	7
2.3.4 Hierarchical Parzen Window Based	8
2.4 Filtering	11
2.4.1 Morphological Operators	11
2.4.1.1 Erosion	12
2.4.1.2 Dilation	13
2.4.2 Connected Component Labeling and Area	13

Filter

2.5	Object Tracking	16
	2.5.1 Match Criterion	16
	2.5.2 Match matrix	17
	2.5.3 Foreground Object Color Modeling	18
2.6	Kalman Filter	19
	2.6.1 The Process To Be Estimated	21
	2.6.2 Filters Parameter and Tuning	24
CHAPTER 3		
METHODOLOG	GY	
3.1	Overview	25
3.2	Fujifilm FinePix A303	25
	3.2.1 AVI	26
	3.2.2 Load Video Into Matlab Workspace	27
	3.2.2.1 Aviinfo	27
	3.2.2.2 Aviread	27
	3.2.3 Play The Video Sequence	28
	3.2.3.1 Movie	28
3.3	Blaze Media Pro	28
3.4	Matlab	29
3.5	Algorithm Approach	30
	3.5.1 Foreground Extraction	32
	3.5.1.1 Background Modeling	32
	3.5.1.2 Background Subtraction	33
	3.5.1.3 Background Update	33
	3.5.2 Filtering	34
	3.5.2.1 Erosion	34
	3.5.3 Object Tracking	35
	3.5.3.1 Model Based	35
	3.5.3.2 Kalman Filter	36
	3.5.3.3 Adaptive Background Estimation	37
	Using Kalman Filter	

ABSTRACT

The approach and solution of recognizing a moving object is very important in many application contexts such as video surveillance both in indoor and outdoor environments, security monitoring, sport matches and others. In this paper, a moving object is identifying from a video sequence. A background subtraction approach used to perform object recognition is proposed. Background subtraction is a technique used for segmenting out objects of interest in a scene by comparing each new frame to a model of the scene background. It involves comparing an observed image with an estimate of the image if it contained no objects of interest. This paper also applied the erosion as a morphological operator to remove noise. After that, Kalman filter is used to keep track of each object incorporating a unique bounding box.