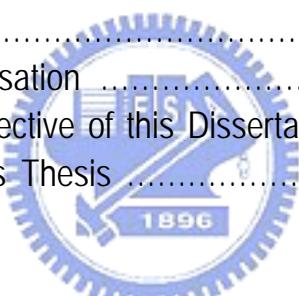


Table of Contents

Abstract (Chinese)	i
Abstract (English)	ii
Acknowledgment	iv
Table of Contents	v
Figure Captions	viii
List of Tables	xii

Chapter 1 Introduction

1.1 Introduction	1
1.2 Light Metering	2
1.3 Scene Analysis	5
1.4 Exposure Compensation	6
1.5 Motivation and Objective of this Dissertation	6
1.6 Organization of this Thesis	7



Chapter 2 Basic Principles of Exposure Control

2.1 Introduction	8
2.2 Factors of Exposure Control	9
2.2.1 Focal Plane Exposure	9
2.2.2 Light Sensitivity of Imaging Media	11
2.3 The Exposure Equation	12
2.4 APEX System	13
2.4.1 Exposure Value	13
2.4.2 EV Compensation	14
2.5 Summary	15

Chapter 3 Traditional AE Methods

3.1	Introduction	16
3.2	Light Metering Methods	16
3.2.1	Method Based on Constant Gray Value	16
3.2.2	Method Based on Look Up Table	18
3.3	Scene Analysis Methods	22
3.3.1	Method Based on HIST Information	22
3.3.2	Method Based on Histogram Information	24
3.3.3	Method Based on Color Information	26
3.4	Summary	28

Chapter 4 Luminance Detection Model and 2-D Scene Analysis Method for Improvement of AE

4.1	Introduction	29
4.2	Luminance Detection Model	30
4.3	2-D Scene Analysis Method	31
4.3.1	Features of the Special Lighting Images	31
4.3.2	Collection of the Database	33
4.3.3	The Fuzzy Rules Base	36
4.4	Summary	39

Chapter 5 Experiment

5.1	Introduction	40
5.2	Luminance Detection Model	41
5.2.1.	Experimental System	42
5.2.2.	Experimental Methods	43
5.3	2-D Scene Analysis Method	47

5.3.1. Experimental System	48
5.3.2. Optimization Methods	49
5.3.3. Performance Test	53
5.4 Summary	55

Chapter 6 Results and Discussions

6.1 Luminance Detection Model Results	56
6.1.1 Results of Kuno Model Test	56
6.1.2 Results of Modified Model Test	58
6.1.3 Results of Small Angle Inclination Test	60
6.1.4 Results of Light Metering Test	61
6.2 2-D Scene Analysis Method Results	63
6.2.1 Results of Optimization Database	63
6.2.2 Results of Fuzzy Rules Base	64
6.2.3 Results of Performance Test	67
6.3 Summary	71



Chapter 7 Conclusion

7.1 Conclusion	72
7.2 Future Work	73

References 75