UNIVERSITI TEKNOLOGI MARA

PROPERTY PREMISES INTRUDERS DETECTION USING FACE RECOGNITION METHOD

JOVENI ANAK HENRY

BACHELOR OF COMPUTER SCIENCE (HONS.)

JULY 2017

STUDENT DECLARATION

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

……..
JOVENI ANAK HENRY
2014428864

JULY 24, 2017

ABSTRACT

Nowadays, many issues and news reported about property premises intrusion have raise major concern among the property premises owner and occupants to protect their safety. Every property premises owner have already taken some action to protect their property premises and safety by using all kinds of methods. However, the current action and method that are usually implemented by the owner can be easily violated and not effective. The rapid and constant advances of technology create opportunities to improve on the security especially for property premises. One of the technology that is rapidly advancing is face recognition. Therefore, this project emphasize strongly on developing a system that can detect intruders of property premises by using the face recognition method. This project will focus mainly on the Viola-Jones algorithm for face and facial parts detection, facial geometry distance measure for feature extraction and Similarity Measure algorithm using the Euclidian Distance to perform face recognition. The significance of this project is that this project may increase the effectiveness of any existing security system that uses video camera or webcam as surveillance. The project can recognize a face and also detect intruders successfully. More features and testing for a more accurate result can be done in future works.

Keyword: Face Recognition, Similarity Measure, Euclidian Distance, Facial Geometry Distance measure, Viola-Jones algorithm, security, property premises, intruders

TABLE OF CONTENT

CONTENT **PAGE**

SUPERVISOR APPROVAL ii
STUDENT DECLARATION iii
ACKNOWLEDGEMENT iv
ABSTRACT v
TABLE OF CONTENT vi
LIST OF FIGURES ix
LIST OF TABLES xi
LIST OF ABBREVIATIONS xii

CHAPTER ONE: INTRODUCTION

1.1 Introduction 1
1.2 Background of Study 1
1.3 Problem Statement 2
1.4 Objectives 3
1.5 Project Scope 3
1.6 Project Significance 3

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction 4
2.2 Property Premises 4
2.3 Image Processing 5
2.4 Face Recognition 6
2.4.1 Face Recognition Stages 8
2.4.1.1 Face Detection 9
2.4.1.2 Face Feature Extraction 14

2.4.1.3 Recognition 22

2.5 Conclusion 27

CHAPTER THREE: METHODOLOGY

3.1 Introduction 28

3.2 Project Methodology Framework 28

3.3 Details of Project Model 29

3.3.1 Planning 29

3.3.2 Requirement Analysis 30

3.3.3 Design 31

3.3.3.1 Process Flow Chart 31

3.3.3.2 User Interface Design 36

3.3.4 Development 39

3.3.5 Testing 45

3.4 Hardware and Software Requirement 45

3.5 Project Timeline 46

3.5.1 Phase 1: Proposal and Design of the Project 46

3.5.2 Phase 2: Development and Testing of the Project 49

CHAPTER FOUR: TESTING AND DISCUSSIONS

4.1 Introduction 50

4.2 Functional Testing 50

4.3 Registering Face Images Process 54

4.4 Face Identification Process 57

4.5 Testing and Discussion Summary 61

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS