OBJECT ANALYSIS MOVEMENT USING CANNY EDGE DETECTION (OAMCEDS)

NOR FARHANA BT SAIDINA HAMZAH

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS TESIS*

JUDUL: OBJECT ANALYSIS MOVEMENT USING CANNY EDGE DETECTION

SESI PENGAJIAN: 2010/2011

Saya NOR FARHANA BT SAIDINA HAMZAH
(HURUF BESAR)

mengaku membenarkan tesis (PSM/Sarjana/Doktor Falsafah) ini disimpan di Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dengan syarat-syarat kegunaan seperti berikut:

1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. ** Sila tandakan (/)

_____	SULIT	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
_____	TERHAD	(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)
/	TIDAK TERHAD	

(TANDATANGAN PENULIS)

Alamat tetap : LOT 172 BATU 3 1/2

KG.BAUNG JALAN PENGKALAN

CHEPA, 16100 KOTA BHARU KELANTAN

Tarikh : 4 Julai 2011

(TANDATANGAN PENYELIA)

Hidayah bt Rahmalan

Nama Penyelia

Tarikh : 4 Julai 2011

CATATAN: * Tesis dimaksudkan sebagai Laporan Akhir Projek Sarjana Muda (PSM)
** Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

OBJECT ANALYSIS MOVEMENT USING CANNY EDGE DETECTION (OAMCEDS)

NOR FARHANA BT SAIDINA HAMZAH

This report is submitted in partial fulfillment of the requirement for the Bachelor of Computer Science (Database Management)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITY TEKNIKAL MALAYSIA MELAKA
2011

DECLARATION

I hereby declare that this project report entitled

OBJECT ANALYSIS MOVEMENT USING CANNY EDGE DETECTION (OAMCEDS)

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: 4/7/11
(NOR FARHANA BT SAIDINA HAMZAH)

SUPERVISOR : _____ Date : 4/7/11
(HIDAYAH BINTI RAHMALAN)

DEDICATION

Bismillahirrahmanirrahim

First of all, I would like to thanks Allah the Almighty because of his award and willing I can complete my project. I also would like to thank to my supervisor, Madam Hidayah binti Rahmalan for giving me help, support, guidance and encouragement to complete my project. There are a number of people without whom this thesis might not have been written, and to whom I am greatly indebted.

Thousand appreciation to all helping hands.

To my beloved family – mom, dad and all my siblings. Thank you for being my guardian angels and giving me endless support.

To my dear Sarah, Aida, Izzati, Dayah and Nik for being so supportive. Thanks for always being there when needed. Friendship Forever.

To my fellow classmate, for ups and down throughout the wonderful 3 years together.

ACKNOWLEDGEMENT

Bismillahirahmanirrahim..

"In the name of Allah, Most Gracious, Most Merciful"

Alhamdullillah, Firstly, I would like to show my gratitude to Allah The Almighty for giving me the strength and good health to complete this Bachelor's project for the student of Bachelor of Information Technology Communication.

I like to thank my parents Saidina Hamzah bin Awang Lah and Che Zaharah bt Mohamed who had given me all the supports that I need not only to complete this project but also from the very beginning of my life in Universiti Teknikal Malaysia Melaka. This includes all aspects such as economics. All of their good deeds could never be repay even to the end of my life.

My thanks are also dedicated to my beloved supervisor, Pn.Hidayah bt Rahmalan who had helped me through a lot for finishing this project. She had thought me everything that I should know and she also had given me moral supports to ensure that I complete this project succesfully.

Lastly, I also would like to thank to all my friends who had helped me to complete this project. Thank you so much for all of them who were involved in this project and their good deed will always remain in my memory forever.

ABSTRACT

Object Analysis Movement using Canny Edge Detection System (OAMCEDS) is a system that develops in order to improve the use of closed circuit television (CCTV). OAMCEDS will integrate with current CCTV added with feature extraction and edge detection function to detect the object movement. The problem of this project are how to differentiate between static and non-static movement, how to get standardize movement result and how to determine object behavior. Methodology that uses to implement OAMCEDS is Database Life Cycle (DBLC) while software that use are MySQL and Matlab. The result that gets from this project is Canny Edge Detection technique is suitable to use in condition where the images has noise. OAMCEDS can be implemented in shopping mall, library or museum as long as there has a CCTV.

ABSTRAK

Object Analysis Movement using Canny Edge Detection System (OAMCEDS) ialah sistem yang akan dibangunkan untuk meningkatkan kegunaan litar televisyen litar tertutup (CCTV). OAMCEDS akan berintegrasi dengan CCTV sedia ada ditambahkan dengan fungsi pengekstrakan ciri-ciri objek dan pengkesanan sisi objek untuk mengesan pergerakan objek. Masalah yang timbul dalam projek ini ialah bagaimana untuk membezakan pergerakan statik dan tidak statik, bagaimana untuk mendapatkan keputusan pergerakan yang selaras dan bagaimana untuk menetukan sifat objek. Metodologi yang akan digunakan untuk melaksanakan OAMCEDS ialah Database Life Cycle (DBLC) manakala perisian yang akan digunakan ialah MySQL dan Matlab. Keputusan yang diperolehi daripada hasil projek ini ialah teknik Canny Edge Detection sesuai digunakan dalam kondisi dimana gambar-gambar ini mempunyai noise. OAMCEDS boleh dilaksanakan di pusat membeli belah, perpustakaan dan muzium selagi disitu mempunyai CCTV.

TABLE OF CONTENS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ABBREVIATIONS

OAMCEDS	Object Analysis Movement using Canny Edge Detection System
3NF	Third Normal Form
SDLC	Software Development Life Cycle
DFD	Data Flow Diagram
CCTV	Closed Circuit Televisyen
DDL	Data Definition Languange
DCL	Data Control Languange

CHAPTER I

INTRODUCTION

1.1 Project Background

In this chapter, the overview of the object movement, and edge detection using the canny edge detection technique will be described. Object movement is an object place changes of the point to another point that can see through different medium such as; eyes, Closed Circuit Television (CCTV), and computer vision. Based on 3 medium above, the movement of an object will detect and analysis. By using the eyes, the observer only can view the movement without know about edge, size and detail of the objects. Based on sophisticated technology CCTV now expands from traffic monitoring, disaster monitoring and public security to private security, marketing and customer management adding intelligent function using computer vision to resolved the weekness of eyes medium on detection and anlysis the movement.

Edge detection is a fundamental tool used in most image processing applications to obtain information from the frames. (Hong Shan Neoh, nd). It is significantly reduce the amount of data in image, and allows project separation and shape detection. It is important to filter out useless information by removing or reducing noise, while a properties structural property in image was preserved. (Raman Maini & Dr. Himanshu Aggarwal)

Canny edge detection is new approach to edge detection, which has gained popularity over the years, especially in the field of computer vision. (Joakim Lindblad, 2007). It is a one of the technique use in edge detection to improve criteria current method of edge detection that was developed by John F. Canny in 1986. This technique uses a multi-stage algorithm to detect a wide range of edges in images. Even though it is quite old, it has become one of the standard edge detection methods and it is still used in research. The canny edge detection algorithm use 5 step to process image which are smoothing, finding gradient, non maximum suppression, double thresholding and edge tracking by hyteresis.

Based on the explanation regarding on combination of three keyword; object movement, edge detection and canny edge detection, the system based on this scenario will be developing to detect and analysis of object movement under project Object Analysis Movement using Canny Edge Detection System (OAMCEDS). Using the OAMCEDS on object movement system, it will classify whether the status of the object is moving or static. This system also will be able to make image analysis that can differentiate the image, make a feature extraction, can login based on authorized user, backup and recovery data, record the data, queries the information, view the video and splitting the video. Based on the ability of the system can do, it will generate the decision making whether the object is moving or static based on value of movement and status of movement. The value of the movement is based on the calculation when 0 and above can produce result as dynamic status and when 0 and below as static status.

The problem statement of the system, goal and scope on the target user, target area and module will be explained on the next section. After that, the significance of the project significance and expected output also will be discussed. The conclusion of the chapter will summarized all the section on this chapter.

1.2 Problem Statement

Nowadays, CCTV is one of a medium use by some person, organization, and company or government firm to prevent crime, traffic jam, or mob, where it is use in public area, road, home and shopping mall.

In website Brick House Security, it explains what a function of CCTV, it said "CCTV is most commonly used for surveillance. Security cameras are now universally featured in many public and private institutions, from a correctional facility to the convenience store. In prisons, the CCTV can reduce the costs of staffing and operating observation towers and make it possible to maintain a constant watch on all areas of the facility."

So based on the explanation above, the one of the system related to the CCTV and edge detection should be developing to avoid of some related problems. The system is using Canny Edge Detection which is OAMCEDS is chosen to detect and analysis the movement of an object. Based analysis that has been interpreted on developing OAMCEDS, the problems were found out which are; how to identify the differences between static and non static movement, how to make data more security and authorized access, how to query fast data and reduce time consuming and how to differentiate between movement from subject and background.

1.3 Objective

Regarding on the problem explained before, the main goal of develop Object OAMCEDS will identify.

The objectives of the system are:

- To recognize the differences between static and non static movement.
- To identify the different between movement from subject and background.
- To study the human behavior by detect the differences of movement at every image.

- User authorized of the system.
- To reduce time consuming.
- To make data secure by applying backup and restore.

1.4 Scope

The scope of the project is focuses to the target user, target area and module that use in this OAMCEDS. The target user in OAMCEDS is the observer, where they are only can view the picture, video and frame of the video. Here the observer can only view an edge detection of every frame. Besides that, the observer can access fully of the system, which is can insert, delete and search the query of the image or video.

The target area is a place that system was placed where using a Closed Circuit Television (CCTV) used for surveillance in shopping mall, parking area, public area, escalator and others places.

In OAMCEDS, the module that included have 9 module, which are Login Module, Record Information Module, Queries Information, Edge Detection Module, Feature Extraction Module, Image Analysis ,Classification Module, Backup and Recovery Module and Report Module.

1.5 Project significance

Project significance is focuses on why OAMCEDS should exist? Based on discussion in Section 1.2 Problem Statements, the suggested system is important for surveillance and security of some area and a situation. For example, escalator in the shopping mall, where OAMCEDS is important in reducing electricity power. The key word 'electricity power ' is highlighted on when the CCTV focuses on the person or object that move and detect it using the system, the escalator will be move, otherwise

it will be static. So, based on this situation, it can save energy and reduce electricity power based on movement.

One of the strengths of Canny Edge detection technique that will be apply on OAMCEDS, it is alert on noise condition so this system is important used on detect crime among crowd people especially in public area, where the system can detect and analysis the movement of an object based on edge of the body, step movement and object behavior. Based on that, the suspect of the object will be focused and will count the movement to see the object is involved or not in crime.

In the perspective business of OAMCEDS, it is develop to sell and help some of firm, individual, institution and others to reduce a criminal statistic among society For the emergency condition such as when a fire alarm occur, OAMCEDS will detect the object behavior either the human is running, static or slow movement. OAMCEDS is important where it can be used on road to counting the car especially in traffic jam. The CCTV is placed at traffic light and the observer can analysis how fast the movement occurs to overcome time problem of traffic jam and the parties can take an action.

1.6 Expected output

Based on the module on Table 1.1, the system will produce the sophisticated system that can solve the problem of processing image and video with save the time, cost and energy. Besides that, OAMCEDS will be able to differentiate within another technique which is the best to detect a movement and edge.