UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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MOTION DETECTION SYSTEM FOR SURVEILLANCE MONITORING

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

by

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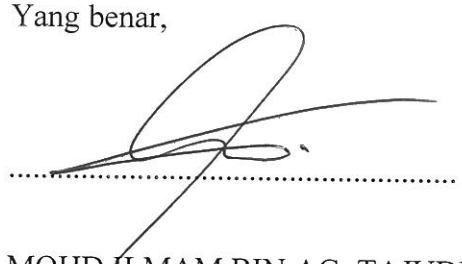

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APPROVAL

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

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ABSTRAK

Projek ini menerangkan tentang sistem pengawasan yang mengesan sebarang gerakan berlaku pada sesuatu kawasan. Sistem ini dikawal oleh mikro pemprosesan Raspberry Pi yang bertindak sebagai komponen elektronik utama berfungsi sebagai memindah data daripada input kamera dan pengesan gerakan kepada output simpanan data iaitu pendrive untuk tontonan masa hadapan dan boleh dipaparkan secara terus melalui paparan skrin monitor. Apabila sebarang gerakan berlaku pada sesuatu kawasan yang dipantau oleh kamera, Raspberry Pi akan menghidupkan pengesan gerakan dan kamera akan mula merekod rakaman sepanjang gerakan itu berlaku. Setelah tiada pergerakan dikesan, kamera akan berhenti merakam dan hasil rakaman akan disimpan pada peranti simpanan untuk tontonan masa hadapan atau boleh dipaparkan terus semasa gerakan objek berlaku. Projek ini sangat bermanfaat kepada pengguna kerana ia tidak merakam sepanjang pemantauan dalam sesuatu tempat dan hanya merakam apabila pergerakan objek berlaku. Dalam masa yang sama ia menjimatkan kadar simpanan data pada peranti simpanan serta projek ini sangat mudah untuk digunakan. Projek ini sangat sesuai untuk kegunaan pengawasan di rumah, pejabat atau premis-premis yang berpotensi berlaku sebarang jenayah.

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ABSTRACT

This project presents about a surveillance system that detect any motion occur in target area. This system controlled by Raspberry Pi microprocessor as a main electronic component functioned as transferring data from camera and motion detection input into the thumb drive output for storage data or it can be displayed by monitor screen. When some movement occur in target area through the monitoring camera, Raspberry Pi will turn on the motion detection and the camera will start record the scene during the motion occur. When no motion detected, the camera will stop recording and the recording data will be saved in storage device for future viewing or it can be displayed directly through monitor screen during the motion occur. This project benefit to user because it not recording all the time during surveillance in target area and it only start recording when any movement object occurs. At the same time, it can reduce of storage data device and this project is easy to use. This project very suitable for home surveillance usage, office or any premise that have a criminal potential.

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DEDICATION

I would like to dedicated and special thanks to

My beloved father and mother,

To my beloved family, my respected lecturer and fellow friends

And for the rest, might Allah have blessed you

Thanks for all the guided and support

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LIST OF SYMBOLS

M	-	Mega
Hz	-	Hertz
Gb	-	Gigabyte
Mbps	-	Megabits per second
s	-	Seconds
m	-	Meter
V	-	Volt

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LIST OF ABBREVIATIONS

USB	Universal Serial Bus
HDMI	High-Definition Multimedia Interface
PIR	Passive Infrared Sensor
GPIO	General-purpose input/output
SMS	Short Message System
CCTV	Closed Circuit Television
VNC	Virtual Network Computing
IP	Internet Protocol
GUI	Graphical User Interface
GSM	Global System for Mobile Communications
ARS	Advance Raspberry Pi Surveillance System
HOG	Histogram of oriented gradients
DC	Direct Current
CPU	Central Processing Unit
RAM	Random Access Memory
LED	Light Emitting Diode
DMA	Direct Memory Access
HDTV	High-Definition Television
SYNC	Synchronization
IR	Infrared sensor

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UI	User Interface
LCD	Liquid Crystal Display
LDR	Light Dependent Resistor
PC	Personal Computer
SD	Secure Digital
VGA	Video Graphics Array
OS	Operating System
I/O	Input/output
AVI	Audio Video Interleave
IoT	Internet of Things
IEEE	Institute of Electrical and Electronics Engineers

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, it will cover about introduction to this project briefly and this chapter discuss about the synopsis of this project, problem statement, objective, scope and significant of this project.

1.2 Project Background

This project Motion Detection System for Surveillance Monitoring is useful for security camera in office, house, factory or every premise. Using this project, it can record when any motion occurs. This system using Raspberry Pi 3 with a camera based circuit and motion sensor. The system will detect a movement and the camera will start recording when it has a motion occur and the motion recording will save in memory and it will be displayed in monitor. The camera input will be processed by Raspberry Pi processor for any motion. If any motion detected, the system will change into alert mode and record the motion occur. Each video that saved in the motion will be viewing later.

1.3 Problem Statement

Nowadays, criminal always happen in many places such as bank robbery, burglary robbery and other premise. It requires a lot of surveillance camera in potentially risky area, but each of the surveillance camera record all the time video and it cause wastage of memory space in storage device. When we want to view back the video, we have to find it all the video play and have to cut which one we want to pick and delete the rest of the videos.

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