UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF SMARTPHONE BASED AUTONOMOUS ROBOT CONTROLLER

his report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electrical and Electronic Engineering Technology (Electric and Electronic) with Honours.

by

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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 Electrical and Electronic Engineering Technology (Electric and Electronic) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Projek ini adalah mengenai pembangunan Autonomous Robot Controller Smartphone berdasarkan visual untuk mengesan bentuk imej menggunakan Machine Learning. Pada masa kini, sensor telah digunakan di seluruh industry. Image processing adalah salah satu inovasi yang dapat digunakan sebagai sensor. Terdapat banyak robot yang memerlukan kawalan atau pemantauan dari manusia. Projek ini berfungsi dimana robot autonomous akan menggunakan imej masa nyata dan aplikasi tersebut mengandungi Interface Pemrograman Aplikasi Objek TensorFlow (API) yang menggunakan Single Shot Detector (SSD) dengan model pra terlatih yang dilatih menggunakan model MobileNet V2 yang dibangunkan di dataset Google . Imej yang ditangkap akan dibandingkan dengan dataset imej pramuat untuk menentukan output projek. Antaramuka aplikasi akan memberikan skor nama objek dan keyakinan. Peralatan perkakasan utama adalah telefon bimbit sebagai sensor dan pengawal untuk robot Automous, mikrokontroler Arduino Uno digunakan untuk menerima isyarat daripada applikasi di dalam telefon melalui Bluetooth dan dua motor DC digunakan untuk roda robot.

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ABSTRACT

This project is about the development of Autonomous Robot based Smartphone Controller for visually to detect shape of image using machine learning. Nowadays, sensors have been used throughout the industry. Image processing is one of the innovations that can be used as sensors. Then, have a many robot needs to be controlled and monitoring by humans and not automated. This project works by the autonomous robot will using capturing real-time images and the application is contained TensorFlow Object Application Programming Interface (API) that uses Single Shot Detector (SSD) with a pre-trained model trained using MobileNet V2 model developed at Google dataset. The captured image will be compared to the preloaded image dataset to determine the project output. The application interface will provide object names and confidence scores. The main hardware equipment is Mobile phone as sensor for Autonomous robot, Arduino Uno microcontroller and two DC motors for wheels of robot.

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DEDICATION

To my beloved mother, Miskiah binti Wakijan and my father Abd Wahab bin Jaafar, my siblings and my fellow UTEM friends that supported me in completion of my project proposal for my Final Year Project.

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TABLE OF CONTENTS

		PAGE
TABLE OF CONTENTS		**x**
TABLES		**xv**
LIST OF FIGURES		**xvi**
LIST OF APPENDICES		**xxi**
LIST OF SYMBOLS		**xxii**
LIST OF ABBREVIATIONS		**xxiii**
LIST OF PUBLICATIONS		**xxiv**
CHAPTER 1	**INTRODUCTION**	**25**
1.1	**Background**	**25**
1.2	**Statement of the Purpose**	**26**
1.3	**Problem Statement**	**26**
1.4	**Scope**	**27**
1.5	**Summary of chapter**	**27**
CHAPTER 2	**LITERATURE REVIEW**	**28**
2.1	**Introduction**	**28**
2.2	**Evolution of Autonomous and Mobile Robot**	**28**
2.3	**Obstacle Autonomous Mobile Robot**	**29**

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2.3.1 Object Detection and Obstacle Avoidance for Mobile Robot using Stereo Camera 29

2.3.2 Implementation of Robot Operating System in Beagle bone Black based Mobile Robot for Obstacle Avoidance Application. 32

2.3.3 Object Detection Using Image Processing For An Industrial Robot 35

2.3.4 Obstacle Avoidance Robotic Vehicle Using Ultrasonic Sensor, Android And Bluetooth For Obstacle Detection 39

2.3.5 Shape Detection Of Object Behind Thin Medium Using Ultrasonic Sensors 40

2.3.6 Linux: An Embedded Operating System For Mobile Robots 44

2.3.7 Obstacle Avoidance of Autonomous Mobile Robot using Stereo Vision Sensor 46

2.3.8 Autonomous Object Detection and Tracking using Raspberry Pi 50

2.3.9 Object Tracking Robot using Raspberry Pi with open Computer Vision (CV). 52

2.3.10 Object Sorting Robot Based on the shape. 55

Objective 59

Methods / System 59

2.3.12 Object Detection and Obstacle Avoidance for Mobile Robot using Stereo Camera 59

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2.3.14 Implementation of Robot Operating System in Beaglebone Black based Mobile Robot for Obstacle Avoidance Application. 59

CHAPTER 3 METHODOLOGY 64

3.1 Introduction 64

3.2 Project Work Flow 64

3.3 Flow chart of Autonomous Robot System 66

3.4 Block Diagram of Autonomous Robot 67

3.5 Illustration layout of Autonomous Robot 67

3.6 Hardware Implementation 68

3.6.1 DC Motor 68

3.6.2 L298D Motor Driver 69

3.6.3 Monovision Camera (Camera Phone) 72

3.6.4 Mobile Phone (Android) 73

3.6.5 Power Supply of Robot System 74

b) Alkaline battery 76

3.6.6 Body Frame of Robot 77

3.7 Software / System Implementation 78

3.7.1 Arduino Uno 79

3.7.2 C Language 79

3.7.3 Android 79

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3.7.4 TensorFlow 81

3.8 Estimated of List Cost price of Component / Equipment 82

3.9 Expected Result 82

CHAPTER 4 83

4.1 Introduction 83

4.2 Experiment Test of Method 83

4.2.1 Experiment Test and Configuration using Robot Operating System (ROS Linux) (First Experiment) 83

4.2.1.1 Step of Installation of Linux Operating System (Ubuntu) 84

4.2.2 Experiment Test and Configuration for PIC16F788A Microcontroller (Second Experiment) 86

4.2.2.1 Configuration of Bluetooth Connection from Device to PIC 16F788A Microcontroller. 87

4.2.3 Experiment Test for connection of Bluetooth circuit and program code using Arduino Uno (Third Experiment) 91

4.2.4 Summary of Experiment Test 94

4.3 Object Detection Workflow 94

4.3.1 Optimizing and Setup Input Pipeline 95

4.4 Object detection classifier training 99

4.5 Distance of Autofocus camera 104

4.6 Result 107

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4.6.1 Interface design 107

4.6.2 Accuracy rate of TensorFlow Object Detection API 109

4.6.3 Summary 110

CHAPTER 5 112

5.1 Conclusion 112

5.2 Future Work 113

REFERENCES 114

APPENDIX 1 117

APPENDIX 2 118

APPENDIX 3 119

APPENDIX 4 120

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TABLES

TABLE	TITLE	PAGE
Table 3.1: Comparison of Motor.		68
Table3.2: Comparison of Motor Driver.		70
Table 3.3: Comparison of Camera(Dubey, 2015).		72
Table3.4: Characteristic of battery (Dowling, 1997).		74
Table 3.5: Comparison of Power Source Battery (Dowling, 1997).		75
Table 3.6: Comparison of Microcontroller of Robot System (Name, n.d.).		78
Table 3.7: Cost List of Component / Equipment.		82
Table 4. 1: Test command.		89
Table 4. 2: Set / inquire module role command		89
Table 4. 3: Analysis of data transmitted (Bluetooth).		93
Table 4. 4: Analysis of data transmitted (Bluetooth).		93
Table 4. 5: Analysis of data transmitted (Bluetooth range).		94
Table 4. 6: Percentages of Accuracy circle dataset.		104
Table 4. 7: Percentages of Accuracy triangle dataset.		105
Table 4. 8: Percentages of Accuracy rectangle dataset.		106

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LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 2.1:	Robot Navigation Schematic Diagram.	29
Figure 2.2:	The geometry of stereo camera (Lagisetty et al., 2013).	30
Figure 2.3:	Formula of 3D Reconstruction (Lagisetty et al., 2013).	31
Figure 2.4:	Block Diagram of System Architecture (Zakaria et al., 2017).	33
Figure 2.5:	Beaglebone Black (Zakaria et al., 2017).	33
Figure 2.6:	Infrared Sensor Block Diagram (Zakaria et al., 2017).	34
Figure 2.7:	The elbow Lab-Volt robot Model 5250 (Zakaria et al., 2017).	36
Figure 2.8:	Signature for regular objects (Zakaria et al., 2017).	37
Figure 2.9:	Center of the ball (Zakaria et al., 2017).	38
Figure 2.10:	Block Diagram (Ankit et al., 2016).	39
Figure2.11:	Hardware (Ankit et al., 2016).	40
Figure 2.12:	Transmission coefficient and reflection coefficient between different media for ultrasonic signal (Win et al., 2018).	41
Figure 2.13:	Formula of reflection and transmission coefficient Ultrasonic waves (Win et al., 2018).	42
Figure 2.14:	Sensor configuration (a) and schematic diagram (b) (Win et al., 2018).	43

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Figure 2.15: Prototype description and schematic diagram for the prototype (Win et al., 2018). 43

Figure 2.16: The Linux Bot prototype (Winfield, 1998). 44

Figure 2.17: Hardware Block Diagram (Winfield, 1998). 45

Figure 2.18: uLinux Bot board (Winfield, 1998). 46

Figure 2.19: Design Robot with Stereo Vision Sensor (Kumano et al., 2000). 47

Figure2. 20: The principle of obstacle detection (Kumano et al., 2000). 48

Figure2. 21: Sample of Obstacle Object (Kumano et al., 2000). 48

Figure 2.22: Stereo vision sensor system (Kumano et al., 2000). 49

Figure2. 23: Basic Structure of Raspberry PI (Jana et al., 2017). 50

Figure 2.24: ATmega 32 (Jana et al., 2017). 51

Figure2. 25: Webcam Camera (Jana et al., 2017). 51

Figure2. 26: Program Code in Python language (Jana et al., 2017). 52

Figure2. 27: Back Ground Subtraction (Karthikeyan et al., 2016). 53

Figure 2.28: Static and dynamic picture analysis (Karthikeyan et al., 2016). 54

Figure 2.29: Shot Boundary (Karthikeyan et al., 2016). 55

Figure 2.30: Block Diagram of System (Garad, 2017). 56

Figure 2.31: Flow of System (Garad, 2017). 57

Figure 2.32: Input Image (Garad, 2017). 57

Figure 2.33: Circle shape detection (Garad, 2017). 58

Figure 2.34: Square shape detection (Garad, 2017). 58

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Figure 2.35: Triangle shape detection (Garad, 2017). **58**

Figure 3. 1: Flowchart overall of Project. **65**

Figure 3. 2: Flowchart of Robot System. **66**

Figure 3. 3: Block Diagram. **67**

Figure 3. 4: Layout Diagram. **67**

Figure 3. 5: DC Motor (Memehctan Murat 2017). **69**

Figure 3. 6: L293D Motor Driver. **71**

Figure 3. 7: Datasheet of L293D motor driver. **71**

Figure 3. 8: Monovision Camera phone. **73**

Figure 3. 9: Mobile Phone (Android Device). **73**

Figure 3. 10 Lithium Polymer (Li +) in mobile phone (HARDING ENERGY, 2015). **76**

Figure 3. 11: Supply power to Wheels. **76**

Figure 3. 12: Chassis and DC motors (Memehctan Murat 2017). **77**

Figure 3. 13: Android Studio. **80**

Figure 3. 14: A schematic TensorFlow dataflow graph for a training pipeline, containing subgraphs for reading input data, preprocessing, training, and checkpointing state. **81**

Figure 4. 1: Interface Ubuntu Linux OS sign-up. **84**

Figure 4. 2: Desktop interface in Ubuntu Linux OS. **85**

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Figure 4. 3: Bootloader Startup when open the laptop. 85

Figure 4. 4: Command Prompt. 85

Figure 4. 5: UC00B Converter. 87

Figure 4. 6: HyperTerminal Software. 88

Figure 4. 7: Port & LPT Configuration in Device Manager. 88

Figure 4. 8: Schematic for simulation of Circuit. 90

Figure 4. 9: Testing circuit on the Breadboard. 90

Figure 4. 10: Arduino with Bluetooth module circuit connection. 91

Figure 4. 11: Program code for testing Bluetooth connection between devices (mobile phone) with Arduino board. 92

Figure 4. 12: Char 'a' is transmitted, LED will be turn on. 92

Figure 4. 13: Char 'b' is transmitted, LED will be turn off. 93

Figure 4. 14: Program code for download 'Shapedd' Folder. 95

Figure 4. 15: Program code to create base of model from the pre-trained convnets.96

Figure 4. 16: Program code to compile data model. 96

Figure 4. 17: Program Code to start training the image. 97

Figure 4. 18: The value of loss and accuracy validation in train. 97

Figure 4. 19: Program code to convert toTFLite and download the model.tflite and label.txt. 98

Figure 4. 20: The training and validation accuracy of shaped class using 10 epoch.100

Figure 4. 21: The value of loss and accuracy validation class of shaped using 25 epoch. 101

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Figure 4. 22: The training and validation accuracy of shaped class using 25 epoch.102

Figure 4. 23: The training and validation accuracy of shaped class using 70 epoch.103

Figure 4. 24: Percentages of Accuracy circle dataset. 104

Figure 4. 25: Percentages of Accuracy circle dataset. 105

Figure 4. 26: Percentages of Accuracy circle dataset. 106

Figure 4. 27: Graphical User Interface (GUI). 107

Figure 4. 28: Program code for call model data to Android Studio. 108

Figure 4. 29: Program code to check accuracy of model dataset. 110

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LIST OF APPENDICES

APPENDIX	TITLE	PAGE
Appendix 1	Gantt Chart	117
Appendix 2	Circuit Diagram	118
Appendix 3	PCB Layout Schematic	119
Appendix 4	Project Review	120

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LIST OF SYMBOLS

V	**Volt**
A	**Ampere**
mA	**MiliAmpere**
cm	**Centimeter**
m	**Meter**

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LIST OF ABBREVIATIONS

LED	**Light – Emitting Diode**
DC	**Direct Current**
GUI	**Graphical User Interfacing**
PWM	**Pulse Width Modulation**
PCB	**Printed Circuit Board**
ROS	**Robot Operating System**
CHAR	**Character**
CPU	**Central Processing Unit**

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LIST OF PUBLICATIONS

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