UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ULTRASONIC OBJECT DETECTION FOR BLIND PEDESTRIAN

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

by

WAN MUHAMMAD AIMAN BIN TUAN MAT

B071510506

961017-04-5241

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING TECHNOLOGY

2019

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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Tajuk: ULTRASONIC OBJECT DETECTION FOR BLIND PEDESTRIAN

Sesi Pengajian: 2019

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ABSTRAK

Orang yang kurang upaya memerlukan bantuan terutamanya orang pejalan kaki buta untuk golongan mereka untuk berjalan dengan bebas seperti orang yang normal. Apatah lagi di zaman sekarang yang begitu canggih dengan adanya teknologi yang serba moden, tentunya mudah untuk menyediakan dan membantu golongan ini menunaikan hasrat mereka seperti jalan seperti biasa tanpa membahayakan keselamtan diri mereka. Oleh itu, amatlah perlu bagi seseorang yang pakar dalam bidang teknologi ini untuk membantu meringankan beban mereka untuk berjalan seperti sediakala. Dengan mencari dan membaca serta menganalisis journal, saya dapat memilih komponen yang sesuai untuk digunakan dalam projek saya ini. Selain itu juga, bagi mendapatkan hasil kajian ini saya mencari sumber di internet tentang kajian ini. Ianya sangat membantu saya dalam menambahkan ilmu pengetahuan dengan lebih mendalam tentang ultrasonic sensor dan hardware serta software yang mana patut di gabungkan bagi menghasilkan sesuatu projek yang berkesan. Saya banyak memperoleh idea-idea untuk menghasilkan satu produk atau kemudahan bagi membantu golongan pejalan kaki buta dalam dunia ini. Kesimpulannya, kecanggihan teknologi masa kini banyak membantu manusia terutamanya yang kurang upaya.

ABSTRACT

People with disabilities need help especially blind pedestrians for their group to walk freely like a normal person. What's more in today's sophisticated technology with modern technology, it's easy to provide and help these people fulfill their desires like the usual way without jeopardizing their own safety. Therefore, it is necessary for someone who specializes in this technology to help ease their burdens to walk the way they are. By searching and reading and analyzing journals, I can choose the right components to use in my project. In addition, to get the results of this study I am looking for a source on the internet about this study. It really helps me to deepen my knowledge of ultrasonic sensors and hardware and software which should be combined to create an effective project. I get many ideas to produce a product or facility to help blind pedestrians in this world. In conclusion, today's technological sophistication has helped many especially those with disabilities.

DEDICATION

First and foremost, I'm happy that my Bachelor Degree Project (BDP) is done. My fatigue has been paid with this pretty sweet success. All the advices and sacrifices of my parents on my side that always give encouragement, may add to my confidence to finish this project. Also, thanks to all the lecturers who gave me guidance, teach me what I did not understand, especially to know about the details of my project even though your time was short. Also, be willing to spend time with me to discuss the problems I faced in the making of this project.

ACKNOWLEDGEMENTS

I would like to thank the Technical University of Malacca for the facilities provided and assistance in the success of this project. And all parties involved are directly or indirectly helping me to complete this project successfully. Also, do not forget my supervisor, Encik Mazree bin Ibrahim, who gave me instructions and guidance so that I can prepare very well. Friends, thank you for your help too. Last but not least, thanks to my both panel Encik Maslan bin Zainon and Encik Salihin bin Saelal who always give me motivation and enthusiasm if I give up. Finally, I strongly welcome any suggestions for the purpose of improving and improving the project to further improve its effectiveness.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF SYMBOLS

1	-	Length
m	-	Mass

LIST OF ABBREVIATIONS

LED	Light Emitting Diode
IDE	Integrated Development Environment
MIT	Massachusetts Institute of Technology
LCD	Liquid Crystal Display
CM	Centimetre

CHAPTER 1

INTRODUCTION

1.0 Introduction

Year after year, various technologies have been introduced and explored. Various technology-based products have also been created as a result of technological advocacy. Engineers have also made various inventions in this technology. In the past, blind-sighted people, especially blind walkers, were easier and more comfortable to use walking sticks. They also use the hearing senses of the ear to find out the obstacles that are in front of them or around them. However, it is inefficient in determining the barrier either near or far. Apart from that, they also use their dog or trained dogs to help them walk through various obstacles in their surroundings. However, only a trained dog can help and need a long time to train the dog. So, it is very difficult for the system as well. Yet there are still blind pedestrians still using guide dogs. Some even use both, guide dogs and walking sticks. It is up to each other's needs. Despite some initial effort the system is expected to replace walking sticks or dog guides, more recent efforts have been focused on devices and a system designed to add and support system for this basic mobile tool. With the flow of modernity and advancement in the technology world, several product and technology have been created to assist the problem. An ultrasound sensor and technology-based ultrasound system has been introduced to assist this mobility.

1.1 Project Background

This project is developed to know more about on ultrasonic technology. This project was born by my own desire to fulfill the psm. Pedestrian injury, death and this causes serious concern around the world. Among those who care about this is the government in Malaysia which builds pedestrians of safety-related products, research papers, and technology for various users to help improve the conditions for pedestrians. For example, KL Central Management provides a 'tactile' walkway for disabled people (disabled) especially visually impaired using new pedestrian walkways from Jalan Tun Sambanthan KL Central Project Director Nooraini Mohamad Rashidi said this was because it always took into account the concerns and opinion of all parties who would use the new pedestrian route. To guide the direction of agencies in developing and disseminating relevant products in the future, the Strategic Plan the Pedestrian Safety Program is required has been planned. This tool drive eventually helps in reducing pedestrian deaths and injuries and improving pedestrian accessibility. Table 1 shows the statistics on OKU registration with the Department of Social Welfare (JKM) in 2006 (Omar, M. H., 2008).

Table 1.1.1: The statistics on OKU registration with the Department of Social Welfare (JKM) in 2006 (Omar, M. H., 2008)

Year	2006	2007
Type of defects	Statistics (person)	Statistics (person)
Visually impaired	18 258	14 154
Handicapped hearing	29 522	22 728
Disability body	66 250	45 356
Celebral palsy	887	
Problem learning	76 619	49 340
Others	5 983	1077
Total	197519	220250

1.2 Problem Statement

Road users are not just those who use cars or motorcycles, but also walkers. This is an important issue especially for pedestrian safety. To make it easier for pedestrians to cross the road safer, the transport authorities are committed to making these tasks. In addition, this can ensure that the flow of traffic is not too disturbed at the same time. Perhaps with just walking on the street it is easier to go to somewhere. In addition, road congestion due to the large number of cars also makes it difficult for pedestrians to cross the road and at risk. For blind walkers, they are very risky for accidents that may occur on them. In this situation, transport authorities also need to think of ways to address this

problem. Blind pedestrians may need a more effective tool that can help them to walk. With the help of today's technology, this problem may be overcome by using ultrasonic.

1.3 Objective

1) Development of a product or hardware that can detect the distance and track the obstacles ahead.

2) To design smart blind cane using ultrasonic sensor, voice module and buzzer.

3) To analyze the distance of the obstacle from the smart blind cane.

1.4 Work Scope

In this project, the aim of design is based on three designs, which are mechanical design, electronic design and software design.

1.4.1 Mechanical Design

- To design the body structure of a blind guide cane walking stick.
- The design based on long stick like a lightweight walking stick that makes it easy for users.

1.4.2 Electronic Design

- Ultrasonic sensor will be use. It will be sensing the obstacles ahead and will give input to the microcontroller. An ultrasonic sensor is one of the examples of devices that can measure distances to objects. It uses sound

waves. By transmitting sound waves at specific frequencies, they measure the distance and hear the sound waves to bounce back. LCD display will show the distance value and the buzzer will ring.

1.4.3 Software Design

- The MIT App and Arduino IDE software is used to program, code editor and to debug.

1.5 Conclusion

In this chapter mainly brief about introduction of the project. There are many blind pedestrians out there. Current blind pedestrians need technology assistance like this. This is to make it easier for them to go anywhere they want to go. For normal people, maybe they cannot feel what blind pedestrians are. However, normal people need to help them in any way. In addition, it can reduce mortality rates on the road due to accidents.