



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

WALKING STICK EMBEDDED with WIRELESS EARPHONE

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Electronic Engineering Technology (Telecommunication) with Honors

by

SYAIDATUL HUZALIZA BINTI SHAMSUDIN

B071110123

890929-14-5856

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunications) with Honours

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(Project Supervisor)

ABSTRAK

Cacat penglihatan bukanlah satu fenomena baru dalam masyarakat. Ia merupakan suatu keadaan penglihatan yang tidak jelas dan disifatkan sebagai kerosakan visual teruk. Orang buta adalah mereka yang mempunyai ketajaman penglihatan 20/200 atau (6/60). Ini bermakna seorang buta perlu berdiri pada jarak 20 kaki (6 meter) untuk melihat objek yang orang normal dapat lihat dengan jelas pada 200 kaki (60 meter). Orang buta mengalami kesukaran untuk melihat objek, tanda jalan, lampu isyarat dan lain-lain. Mereka lebih mudah mengalami kemalangan kerana mereka tidak boleh melihat dengan jelas keadaan di sekeliling. Orang buta selalu mencuba untuk menyesuaikan diri dengan persekitaran. Bagaimanapun aktiviti mereka sangat terhad disebabkan kehilangan penglihatan. Orang buta boleh bergerak bebas menggunakan pelbagai peralatan berjalan dengan teknik tertentu. Mereka telah diajar untuk mengembara dengan selamat, yakin dan bebas di rumah dan persekitaran. Mereka dapat mencari jalan dengan mudah jika telah biasa dengan sesuatu persekitaran atau laluan. Pergerakan dari satu tempat ke tempat yang lain adalah penting dan bantuan yang digunakan adalah sebatang tongkat. Tongkat konvensional yang digunakan tidak efisien untuk mengesan objek yang berada di depan pengguna. Mereka hanya boleh mengetahui terdapat objek di depan mereka dengan mengesannya dengan tongkat. Sebatang tongkat untuk orang buta yang menggunakan pengesan jarak ultrasonik akan menjadi alat bantu yang penting buat mereka kerana tongkat ini dapat mengesan objek dalam julat jarak tertentu, dan pengguna dapat mengelak objek tersebut tanpa perlu mengetuk objek dengan tongkat.

ABSTRACT

Blindness is not a new phenomenon in the society. It is a condition of lacking visual perception and always described as severe visual impairment with residual vision. The legally blind people are those who have the visual acuity of 20/200 or (6/60). It means that a blind person needs to stand within 20 feet (6 meters) to see an object which someone with normal visual acuity can see from 200 feet (60 meters) away. The legally blind people has trouble seeing things which other people take for granted, like road signs, traffic lights, and so forth. They are more prone to falls and other accidents because they cannot clearly discern their surrounding environment. The visually challenged people or the blind people are always trying to adapt with the surroundings. However their life and activities are greatly restricted by loss of eyesight. Many people with serious visual impairments can travel independently, using a wide range of tools and techniques. They are taught how to travel safely, confidently, and independently in the home and the community. They can find the way easily if they are familiar with an environment or route. The most important mobility aid that used by them is a walking stick or also known as walking cane. The conventional walking stick employed by the visually challenged people is actually not efficient to detect the object in front of the user. They can only detect the object that is being hit by the walking stick

DEDICATION

To my beloved parents, family, friends and supervisor.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

ID	-	Identification
IR	-	Infrared
EMF	-	Electromotive Force
US	-	Ultrasonic Sensor
LED	-	Light Emitting Diode
LDR	-	Light Dependent Resistor
CCD	-	Charge Couple Device
CDS	-	Cadmium Sulphide
VLTP	-	Lower Trigger Point Voltage
VUTP	-	Upper Trigger Point Voltage
PIC	-	Programming Integrated Circuit

CHAPTER 1

INTRODUCTION

1.1 Background

More than 161 million people worldwide are visually impaired. Among them, 124 million have low vision and 37 million are blind. Another 153 million people suffer from visual impairment due to uncorrected refractive errors such as near-sightedness, far-sightedness or astigmatism. Virtually all these people could restore normal vision with eye glasses or contact lenses. More than 90% of the world's visually impaired people live in low- and middle-income countries. Except in the most developed countries, cataract remains the leading cause of blindness. Blindness is a condition of lacking visual perception and it is always described as severe visual impairment with residual vision. The blind people's life and activities are greatly restricted by loss of eyesight. They can only walk in fixed routes that are significant in their life, with blind navigation equipments and the accumulated memories in their long-term exploration.

This situation has resulted in many difficulties to them in their normal work. Based on the investigation about daily activities characteristics and modes of the blind, the study found that the main difficulty encountered in a trip of the blind included walking on the road, finding way, taking a bus and looking for usual life-arena. Several devices have been developed for mobility and navigation assistance of the blind and are typically known as travel aids or blind mobility aids. The most successful and widely used travel aid is the long cane. The walking cane used by the visually challenged people is a white cane with a red tip which is the international symbol of blindness. It is used to detect obstacles on the ground, uneven surfaces, holes, steps, and puddles. Blind pedestrians usually tap their cane on the ground, and the resulting vibrations indicate the nature of the surface. Tapping also produces sound, which is then reflected by nearby obstacles. Very skillful travelers are able to detect these echoes and their direction of origin.

1.2 Problem Statement

Walking stick or walking cane is the most important equipment needs by the blind people to help them walking. The conventional walking stick which is a long white cane that is relatively easy to use, light and not expensive.

- However its range of detection is very limited and it is only used to detect the object which is near to the user.
- The user has to tap the ground or the object to detect the obstacle.
- The foremost disadvantage of the conventional cane, however, is its failure to detect obstacles outside of its reach.

The visually challenged people can avoid the object better if the walking stick can produces audible warning when there is an object in the specific range of distance. This kind of travel aid is able to alarm them about the object in front of them by producing sound when the distance sensor detects the object in the specific distance range embedded with wireless earphone.

1.3 Objective

The objective of this project is:

- To alert the blind people about an object in front of them within specific range.
- Embedded with wireless earphone.

1.4 Project Scope

This project is focusing on the detection of object that is in front of the user within the specific distance range which is depending on the type of distance sensor used. In this project, an ultrasonic sensor is going to be used. As the object is closer to the sensor, the signal produced is increased as well. The signalling mean of the walking stick is a buzzer which produces sound when the object is detected. The strength of the sound is increasing as the object is getting closer to the user.

1.5 Project Significance

This project will be implementing to market nowadays, because this project can help the user or blindness person in their daily life. This project also wants the surrounding people or normal person help the user automatically. This walking stick is very unique because, in this project as added the buzzer as a alert to user and also provided the wireless earphone to the user. From this added it is very big advantages to user use it in their daily life. However, in this project also added the LED in the canes of walking stick? This LED have function it to the surrounding people to became alert for this user and automatically help them.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter includes the study of medical information about blindness disease such as the facts about the causes of this disease and also the aids used by blind people. There are many types of infrared distance sensor which depend on their range of detection and the theory of infrared light as well as the basic principle infrared distance sensor explained in this chapter.

2.2 Medical Information of Blindness

Human eye is an organ which gives the sense of sight, allowing people to observe and learn more about the surrounding world. Eyes are used in almost every activity in daily life, whether reading, working, watching television, writing a letter, driving a car, and in countless other ways. The eye allows human to see and interpret the shapes, colours, and dimensions of objects in the world by processing the light they reflect or emit. The eye is able to detect bright light or dim light, but it cannot sense an object when light is absent.