FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

FINAL YEAR PROJECT REPORT

TITLE: SMART WALKING STICK FOR THE VISUALLY IMPARED PEOPLE

BY

JOEL BASADHA BU/UP/2020/2572 joelbashiza@gmail.com Tel: 0742841679

JOVIA NAKITTO BU/UP/2020/1864 Ottikan77@gmail.com Tel: 0776822904

SUPERVISED BY

Eng. ERIC BUTIME

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Abstract

This report presents the smart walking stick based on ultrasonic sensors and Arduino for visually impaired people. People with visual disabilities are often dependent on external assistance which can be provided by humans, trained dogs, or special electronic devices as support systems for decision making. Thus, we were motivated to develop a smart white cane to overcome these limitations. We accomplished this goal by adding ultrasonic sensors at specific positions to the cane that provided information about the environment to the user by activating the buzzer sound. We proposed low cost and light weight system designed with microcontroller that processes signal and alerts the visually impaired person over any obstacle, pits, elevated surfaces, through beeping sounds. The system consists of obstacle sensors for receiving, processing and sending signals to the alarm system which finally alerts the user for prompt action. The system was designed, programmed using C language and tested for accuracy and checked by the visually impaired person. Our device can detect obstacles within the distance of about 1m from the user.

Declaration

We (JOEL BASADHA BU/UP/2020/2572 and JOVIA NAKITTO BU/UP/2020/1864) declare that this report is an original report and has not been published or submitted before to any university or any higher institution of learning.

JOEL BASADHA

Sign :

Date : 11 - 1 - 2023

JOVIA NAKITTO

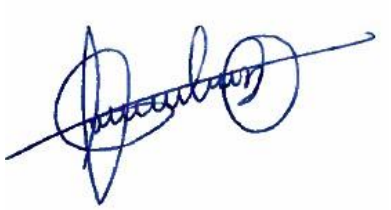
Sign :

Date : 11 - 1 - 2023

Approval

This project report is presented to Busitema University with the approval of our supervisor

Eng. ERIC BUTIME

Signature : 

Date : 10 - 1 - 2023

Dedication

We dedicate this report to our beloved parents, friends, lecturers and all our colleagues for their contributions towards our success.

Acknowledgement

Above all we acknowledge the Almighty God for the gift of life, wisdom and guidance for without him, we wouldn’t have been able to accomplish our Final year project.

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Table Of Contents

Abstract i

Declaration ii

Approval iii

Dedication iv

Acknowledgement v

Chapter One: Introduction 1

1.1 Background 1

1.2 Problem Statement 1

1.3 Objectives 1

1.3.1 Main Objective 1

1.3.2 Specific Objectives 2

1.4 Significance Of Study 2

1.5 Scope 2

1.5.1 Technical Scope 2

1.5.2 Geographical Scope 2

1.5.3 Time Scope 2

Chapter Two: Literature Review 3

2.0 Introduction 3

2.1 Definitions 3

2.1.1 Distance vision impairment: 3

2.1.2 Near vision impairment: 3

2.2 Prevalence 3

2.3 Causes of vision Impairment 4

2.4 Personal impact of vision Impairment 5

2.5 Economic impact 5

2.6 Strategies to address eye conditions to avoid vision impairment 5

Chapter Three: Methodology 7

3.0 Introduction 7

3.1 Requirements Gathering 7

3.1.1 Data Collection 7

3.1.2 Document Review 7

3.1.3 Consultation 7

3.2 Requirements Analysis 7
3.2.1 Functional Requirements 8
3.2.2 Non-functional Requirements 8
Chapter Four: System Design and Implementation 9
4.1 Hardware Description 9
4.1.1 Arduino Nano 9
4.1.2 GPS Module 10
4.1.3 GSM-Module 10
4.1.4 Ultrasonic sensor 11
4.1.5 Buzzer 12
4.1.6 Jumper Wire 12
4.2 Software Description 13
4.2.1 Arduino IDE 13
4.2.2 Proteus 14
4.3 Block Diagram of Smart blind stick using Arduino 15
4.3.1 Block diagram description 16
4.4 Circuit Diagram and Operation 18
4.4.1 Circuit diagram description 18
4.5 Source Code 19
4.5.1 Ultrasonic Sensors 19
4.5.2 GSM and GPS Module 21
Chapter Five: Challenges, Recommendations and Conclusions 24
5.1 Challenges 24
5.2 Recommendations 24
5.3 Conclusion 24
Appendices 25
Appendix 1: Project Schedule 25
References 26

Chapter One: Introduction

1.1 Background

A survey by WHO (World Health Organization) carried out in 2012 estimates that in the world, about 1% of the human population is visually impaired (about 70 million people) and amongst them, about 10% are fully blind (about 7 million people) and 90% (about 63 million people) with low vision. The main problem with blind people is how to navigate their way to wherever they want to go. Such people need assistance from others with good eyesight. As described by WHO, 10% of the visually impaired have no functional eyesight at all to help them move around without assistance.

The conventional navigation aids for persons with visual impairments are the walking cane (also called white cane or stick) and guide dogs which are characterized. The most critical shortcomings of these aids are: They need essential skills and training phase for studying and knowing various motions. This study proposes an alternative that is an electronic blind walking stick to help visually impaired people in navigation.

1.2 Problem Statement

The visually impaired people should navigate smoothly without too much mechanics like swinging a cane, we proposed they should just hold their navigating aid equipment in front of them while walking and they will be alerted by an alarm when there is an obstacle in front of them. Impaired people shouldn't always navigate their paths by swinging around a cane or stick to be able to know if there are obstacles in front of them, because they actually don't know what is in front of them, what if it's a delicate plant it could get damaged just with a swing of the cane, a glass could break, suppose a child is in front of their way they could get hurt depending on the intensity of the swing etc.

1.3 Objectives

1.3.1 Main Objective

- To design and construct an Electronic blind walking stick for visually impaired people that can detect obstacles, make navigation easier and keep track of the user.

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