



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

**FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING
A CHILD SPEECH DEVELOPMENT AND WALKING AID SYSTEM.**

A FINAL YEAR PROJECT REPORT

By;

NAGASHA ELIZABETH

BU/UG/2016/1721

SUPERVISOR: DR. OCEN GILBERT

A project proposal report submitted to the Department of Computer Engineering in partial fulfilment of the requirement of the award of a Bachelor's Degree in Computer Engineering of Busitema University.

January 2021

ABSTRACT.

A Child Speech Development and Aid System was designed, developed and tested to reduce in children developmental delays that is; improve walking and speech development even in the absence of care takers. The system is implemented on an Arduino board with an ultrasonic sensor to detect obstacles. This is mounted on top of a movable system which has a soft seat with two leg holes where the baby stands for him to be able to move. The system also has a speaker that outputs baby sounds initially stored on a ScanDisk card which help the baby in speech development.

The entire system is able to move by the help of Direct Current motors which are connected to the wheels. The system can be started or stopped by the help of the mobile application which is connected to the system via a Bluetooth connection. The application also notifies the care taker incase the system gets faulty.

DECLARATION

I **ELIZABETH NAGASHA** Reg.No **BU/UG/2016/1721** hereby declare that this project report is my original work except where explicit citation has been made and it has not been presented to any Institution of higher learning for any academic award.

Signature

Date

APPROVAL

This is to certify that the project titled “A Child Speech Development And Walking System” has been done under my supervision and is now ready for examination.

Name: Dr. OCEN GILBERT

Signature

Date:

ACKNOWLEDGEMENT

I thank the Almighty God for the gift of life, knowledge, wisdom, understanding and guidance for without Him, I would not have been able to accomplish this project. Am greatly thankful to my supervisor Mr. Ocen Gilbert for helping me through the project preparation.

I also thank all the other department lecturers who have always given me time for consultation. And to my amazing parents, I will forever be in your debt for the opportunity you have given me to attain this education.

I lastly thank my fellow students who offered me help throughout the preparation of this project report.

LIST OF ABBREVIATIONS

DC	Direct Current
ID	identification
PCB	Printed Circuit Board
SD	ScanDisk
SPI	Serial Peripheral Interface
TF	TransFlash

LIST OF FIGURES.

Figure 3-1 Block Diagram of the Developed System.....	10
Figure 3-2 Ultrasonic sensor	11

Table of Contents

ABSTRACT.....	i
DECLARATION	iii
APPROVAL.....	iv
ACKNOWLEDGEMENT.....	v
LIST OF ABBREVIATIONS	vi
LIST OF FIGURES.....	vii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background:	1
1.2 Problem statement.....	2
1.3 Objectives of the study	2
1.3.1 Main Objective.....	2
1.3.2 Specific Objectives	2
1.4 Justification	3
1.5 Scope of the study	3
1.5.1 Technical scope.....	3
1.5.2 Geographical scope.....	3
1.5.3 Time scope	3
CHAPTER TWO: LITERATURE REVIEW	4
2.1 Introduction	4
2.2 Related systems.....	4
2.2.1 Baby walkers.....	4
2.2.2 Baby Jumpers.....	4
2.2.3 Speech Enhancement Mobile applications.....	4
2.2.4 Nanny Care.....	5
2.3 Microcontroller programing	5
2.4 Movement.....	5
2.5 Table 2-1 showing research gaps of the existing systems.....	6
2.6 Developed system.....	7
CHAPTER THREE: METHODOLOGY.....	8
3.0 Introduction	8
3.1 Requirements Elicitation / System Study.....	8
3.2 Data Collection Methods	8

3.2.1 Literature review.....	8
3.3 Requirements Analysis.....	8
3.3.1 Functional Requirements.....	8
3.3.2 Non-functional Requirements	8
3.4 System Design	9
3.4.1 Hardware	9
3.4.2 Software tools.....	9
3.5 System Block Diagram.....	10
3.6 Implementation.	10
3.7 Testing.....	11
3.7.1 Unit testing.....	11
3.7.2 Integration testing.	12
3.7.3 System testing.....	12
CHAPTER FOUR: SYSTEM DESIGN AND ANALYSIS.....	13
4.0 Introduction	13
4.1 Functional Analysis.....	13
4.2 Requirements Analysis.....	13
4.2.1 Functional Requirements.....	13
4.2.2 Non-Functional Requirements.....	13
4.3 System Design	14
4.3.1 Logical design of the system.	14
4.3.2 Circuit Diagram.....	15
4.3.3 Physical Design.....	15
CHAPTER FIVE: IMPLEMENTATION AND TESTING	16
5.1 Design and Development Platforms	16
5.1.1 Arduino IDE	16
5.1.2 App inventor	16
5.2 Testing.....	16
5.2.1 Unit Testing.....	16
5.2.2 Integration Testing.....	16
5.2.3 System Testing	16
CHAPTER SIX: DISCUSSIONS AND RECOMMENDATIONS.....	17
6.1 Summary of the work done.	17

6.2 Appraisal of the project.	17
6.3 Recommendations	17
6.4 Conclusion.....	17
APENDICES.....	19
References	22