



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

FINAL YEAR PROJECT REPORT

**PROJECT TITLE: AUTOMATIC ROAD SIGN IDENTIFICATION AND
SPEED CONTROL SYSTEM**

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**Final Year Report Submitted to the Department of Computer Engineering in
Partial Fulfillment of the Requirements for the award of Bachelor of
Computer Engineering of Busitema University**

May 2017

DECLARATION

I, ASIBAZUYO VICTORIA Reg. No BU/UG/2013/1570, 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.

Sign:

Date:

APPROVAL

This is to certify that the project report under the title “Automatic road sign identification and speed control system” has been under my supervision and is now ready for examination.

Sign:

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ACKNOWLEDGEMENT

First of all, I thank almighty God for the strength and protection given to me during the course of the training.

Secondly, I extend my sincere appreciation to my supervisor, MR.ARINEITWE JOSHUA who has continuously guided me throughout this project

Thirdly, I do appreciate the efforts of dear parents who have been there for me amidst all challenges and their support throughout the whole process of my project. Just know that with the financial support, prayers, encouragements and advice you have given me has really brought me this far and nothing would have been accomplished without you. Surely, there is nothing I can give to pay you other than praying for God's providence and blessings.

Finally, I must say congratulations to all my classmates for completing the entire period of projects and I dearly thank those who provided me with e-research, discussions and tools for my successful study. May God bless you.

DEDICATION

To my beloved parents, Mr. Andama Wilson and Mrs. Enyaru Suzan and my siblings. They have always been there for me even when the going seems toughest, I love you all and may the almighty God reward you. Glory be to God Almighty.

TABLE OF CONTENTS

DECLARATION	i
APPROVAL	ii
ACKNOWLEDGEMENT	iii
DEDICATION	iv
TABLE OF CONTENTS.....	v
LIST OF FIGURES	viii
LIST OF TABLES	ix
LIST OF ACRONYMS	x
CHAPTER ONE	1
INTRODUCTION	1
1.1 BACKGROUND.....	1
1.2 PROBLEM STATEMENT	2
1.3 OBJECTIVES	3
1.3.1 Main Objective	3
1.3.2 Specific Objective.....	3
1.4 JUSTIFICATION.....	3
1.6 SCOPE	3
1.6.1 Technical Scope.....	3
1.6.2 Geographical Scope	3
1.6.3 Time Scope	3
CHAPTER TWO	4
LITERATURE REVIEW	4
2.1 DEFINITIONS, CONCEPTS AND DESCRIPTIONS.....	4
2.1.1 Road Signs	4
2.1.2 Identification.....	4
2.1.3 Speed Control	4
2.1.4 Automation	4
2.1.5 Radio Frequency Identification	5
2.1.6 Engine Control Unit (ECU).....	7
2.1.7 Arduino Uno Micro Controller.....	7

2.1.8 Arduino Technology.....	8
2.1.9 Liquid Crystal Display (LCD).....	9
2.1.10 Voltage Regulator.....	10
2.1. 11 Relay Switch.....	11
2.3 THE EXISTING SPEED CONTROL SYSTEMS	11
2.3.1 Adaptive Cruise Control System	11
2.3.2 Curve Warning Systems	12
2.3.3 Vehicle Speed Tracking and Reporting System for Uganda.....	12
2.3.4 Speed Governors.....	13
2.3.5 Over Speed Violation Management of a Vehicle through Zigbee	13
2.5.6 Sign Posts and Warnings	13
2.5.7 Automatic speed control system using GPS and RFID technology	13
2.4 WEAKNESSES OF THE EXISTING SPEED CONTROL SYSTEMS	14
2.4.1 Adaptive Cruise Control System	14
2.4.2 Curve Warning Systems	14
2.4.3 Vehicle Speed Tracking and Reporting System for Uganda.....	14
2.4.4 Speed Governors.....	14
2.4.5 Over Speed Violation Management of a Vehicle through Zigbee	14
2.4.6 Sign posts and warnings	15
2.4.7 Automatic speed control system using GPS and RFID technology	15
2.5 EXISTING ROAD SIGN IDENTIFICATION MECHANISMS	17
2.6 THE PROPOSED SYSTEM.....	19
CHAPTER THREE	20
METHODOLOGY	20
3.1 REQUIREMENTS ELICITATION	20
3.1.1 Literature Review	20
3.2 REQUIREMENTS ANALYSIS	20
3.3 SYSTEM DESIGN	20
3.3.1 Hardware design.....	20
3.3.2 Software Design	20
3.5 SYSTEM IMPLEMENTATION	21
3.6 TESTING AND VALIDATION.....	21

CHAPTER: FOUR.....	22
SYSTEM DESIGN, IMPLEMENTATION AND TESTING	22
4.1 REQUIREMENT ANALYSIS	22
4.1.1 Functional requirements	22
4.2.2 Non-functional requirements	22
4.2 SYSTEM DESIGN OF THE SYSTEM.....	23
4.2.1 Logical design of the system	23
4.2.2 Physical design of the system.....	25
4.3. CIRCUIT DIAGRAM OF THE SYSTEM	27
4. 4 DEVELOPMENT PLATFORMS.....	27
4.5 CODE DESIGNS	28
4.5.1 Tag Identification code.....	28
4.5.2 Code For Activating RFID reader	29
4.6 SYSTEM TESTING	29
4.6.1 Unit Testing	29
4.6.2 Integration testing.....	29
4.6.3 System Testing	30
4.7 SYSTEM VERIFICATION AND VALIDATION	31
4.8 SYSTEM EVALUATION	31
CHAPTER FIVE	33
CONCLUSIONS, RECOMMENDATIONS AND FUTURE WORK	33
5.1 SUMMARY OF WORK DONE.....	33
5.2 CRITICAL ANALYSIS /APPRAISAL OF THE WORK.....	33
5.3 CHALLENGES FACED.....	33
5.4 TECHNICAL RECOMMENDATIONS FOR FUTURE WORK	34
5.5 CONCLUSION	34
REFERENCE.....	35
APPENDICES	36
A. Design code for the whole system	36
B. RFID reader (right side)B Traffic Signal posts equipped with RF tag (left side) and Automobile equipped with the	44

LIST OF FIGURES

Figure 2. 1 Arduino Uno Microcontroller.....	8
Figure 2. 2 Liquid Crystal Display (LCD).....	9
Figure 4.1 Flow Chart representing the System.....	24
Figure 4.2 Block diagram for transmitter	25
Figure 4.3 Block diagram for automobile receiver unit equipped with display	26
Figure 4.4 Circuit diagram of the system.....	27
Figure 4.5 Driving speed and road sign displayed once detection has occurred	30
Figure 4.6 message after reducing the speed	31
Appendix 1 Traffic Signal posts equipped with RF tag (left side) and Automobile equipped with the RFID reader (right side).....	44

LIST OF TABLES

Table 2. 1 Pin Description of RF module	6
Table 2. 2 Pin Description of LCD	10
Table 2. 3 Comparison of existing speed control systems.....	15
Table 4. 1 Comparison of existing systems and the system	32

LIST OF ACRONYMS

ACC	Adaptive cruise control
ADAS	Advanced driver Assistant system
CC	Cruise control
CWS	Curve warning systems
ECU	Engine control unit
GIS	Geographical Information Systems
GPS	Global Positioning System
LCD	Liquid Crystal Display
LED	Light Emitting Diode
RF	Radio Frequency
RFID	Radio-frequency identification

ABSTRACT

The main objective of this project was to design automatic road sign identification and speed control system for vehicles. The system was able to automatically identify road signs, displays the road signs and warns the driver waits for the driver to respond and if he does not reduce the speed, the system reduces it automatically otherwise no speed reduction. After the road sign is bypassed, led goes on to inform the driver so that he can take action. The system was tested, validated and proven to work. The system as a whole achieved the main objective, which was automatic road sign identification and speed control system. Basing on the design setup of the system, this system can be set up to work in cars. The system at hand was fully operational and its guidelines on future usage were provided in the recommendation. I am convinced beyond doubt that this system is going to help to minimize the number of accidents cases along high ways.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Road signs or traffic signs are designed to assist the drivers in their effort to navigate their vehicles' to their destination efficiently and safely. They can be divided into three main groups: danger proclamation signs (cautionary signs), traffic regulation signs (mandatory signs) and informational signs (informatory signs). Signs that belong to the first group are placed to warn drivers of the dangers that exist ahead on the road, so they can anticipate them. The second group comprises signs that inform the drivers of the special obligations, restrictions or prohibitions they should conform to. The signs of the third group provide information that assists the driver in the navigation task, such as destination and distances, identify points of geographical and historical interest and so on. Road signs are designed in a way that helps the drivers to spot them easily in natural scenes. This is achieved by selecting colors and shapes that differentiate the signs from the background[1].

Very many people violate these road signs which have led to numerous accidents and drivers facing heavy traffic penalties. This has also accounted for about 80 per cent to 95 per cent of the road traffic crashes which have been caused by; reckless driving, over speeding, negligence of road signs by drivers, inconsiderate use of the road and incompetent drivers or ignorance of drivers [2] and the driver not being able to see the road sign especially when it is raining heavily or on a foggy day or at night, it becomes difficult to quickly see and recognize the sign posts and take quick action. People with sight problems also face the same problems. Statistics from Uganda police show that in 2010 and 2011, there were 2,954 and 3,343 people respectively who died due to road accidents, showing a 13.2 percentage increase[3]. According to the Police Annual Crime reports, 3,124 people died from roads accidents in 2012 and 2,937 in 2013. According to the World Health Organization's road safety assessments, Uganda has one of the highest accident rates in the world, with 19,870 accidents in 2012 and 18,368 in 2013. According to [4], Inspector General of Police Kale Kayihura said most accidents happen because road users choose to ignore traffic rules. hundreds of people lost their lives in 2014 across Uganda due to a rise in particular types of crimes or negligence by those entrusted with the lives of others, such as drivers[5] and 3,343 lives were claimed in 2015. According to traffic statistics

compiled by Daily Monitor[6], at least 200 people have been killed and nearly double that number has been injured in road accidents on Kampala-Masaka highway in the last six months of this year 2016.

Numerous measures have been put in place to ensure road safety in Uganda. These include;

- i) The process of tracking and monitoring the behavior of drivers has been done by the traffic officers. The traffic officers stand alongside roads and highways in specific areas with radar speed guns to get the offenders.
- ii) Speed governors that sets and limits car's top speed.
- iii) Humps are put on roads to regulate drivers' speed.
- iv) Checking drivers to ensure that all who drive have proper driving documentation and getting them for periodical refresher course.
- v) Improving the road design where the accidents are induced by bad road design.
- vi) 'Back to primary one exercise' where traffic policemen have been teaching road signs to drivers along Kampala Masaka high way[7].
- vii) Road sign posts and warnings put along the road.

Despite these numerous road safety measures in Uganda which has been helpful, statistics continue to show high accident rates. Therefore there is need for continued attempts to reduce death rates due to road accidents.

1.2 PROBLEM STATEMENT

Negligence of drivers to road signs put along the highway has resulted in to reckless driving, that is vehicles go beyond the speed limits indicated on the road signs. This has led to accidents, some of which are fatal. According to World Health Organization (WHO) Road Safety 2015, there are 27.4 traffic deaths per 100,000 people[8].

To reduce the number of fatalities on our road networks, there is a need for a system which automatically identifies road signs and controls speed.

1.3 OBJECTIVES

1.3.1 Main Objective

To design and implement an automatic road sign identification and speed control system.

1.3.2 Specific Objective

- i. To review the weaknesses of existing traffic accident prevention systems and gather requirements for the automatic road sign identification and control speed system.
- ii. To design the automatic road sign identification and control speed system.
- iii. To implement an automatic road sign identification and control speed system using appropriate tools.
- iv. To test the automatic road sign identification and control speed system.

1.4 JUSTIFICATION

Road accidents on high ways especially on Kampala Masaka high way have claimed many lives and so many vehicles have been destroyed. Sign posts put by road authorities to warn drivers have not been very effective due to drivers' negligence to them, drivers unable to see road signs clearly in order to take action especially at night or when it is raining or foggy and also ignorance to sign posts.

This system on implementation will help the drivers to identify road signs and controls speed of the car and hence reducing on the risk of accidents. The system will be able to work without any assistance from someone and no matter the time of the day hence giving the driver confidence while travelling.

1.6 SCOPE

1.6.1 Technical Scope

The system is hardware based; it only identifies traffic signs and reduces the speed of the vehicle for some specific mandatory traffic signs but does not notify the police.

1.6.2 Geographical Scope

The system is to be used in Uganda by automatic public vehicles on high ways.

1.6.3 Time Scope

This project is expected to take a period of 8 months starting September 2016 to May 2017. This will be shown in the time frame.

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