FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

VEHICLE PROXIMITY DETECTION SYSTEM FOR MOTORCYCLES

BY

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DECLARATION

I OCAYA BRIAN OPIRA declare that the work in this final year project report with all its contents was done by only me except where indicated by citations. I would like to point out that, no one has ever presented or duplicated this kind of proposal or with any of its contents at any institute of higher learning.

Signature.....

Date: .05th./..06...../..2018.

DEDICATION

I dedicate this report to my beloved parents Mr. OPIRA DOMINIC ODUR and Mrs. ADOKORACH GRACE FELISTA. Your contribution to my education has been wonderful, encouraging and promising a bright future in my life. I love you all and May the almighty God bless you exceedingly and reward you abundantly and I promise never to forget you for the unceasing love and care you have always shown me. Glory be to God Almighty.

APPROVAL

This is to approve that the project under the title **"VEHICLE PROXIMITY DETECTION SYSTEM FOR MOTORCYCLES."** has been done under my supervision and now is ready for examination.

Signature..... Date.06/06/2018

Mr. ARINEITWE JOSHUA
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LIST OF ACRONYMS

AC	Alternating Current
CPU	Central Processing Unit
CMOS	Complementary Metal Oxide Semi-Conductor
DC	Direct Current
DRVD	Doppler Radar Vehicle Detection
RF	Radio frequency
LCD	Liquid Crystal Display
PASA	Passive Acoustic Sensing Arrays
POST	Power On Self-Test
RADAR	Radio Detection and Ranging
RMS	Root Mean Square
SCA	Spectral Centroid Analysis
USB	Universal Serial Bus

ABSTRACT

The automotive industry is mainly focusing on the road safety measures. The automobiles have been constantly updating with new sensing technologies to detect blind spots, rear ends which can prevent road accidents.

Motorcycle accidents on the highways are a big factor of mortality and can cause severe injuries, Actually, motorcyclists nowadays are getting more concerned about safety features in their motorcycles and thus are willing to pay the cost of acquiring safer motorcycles.

The existing systems use the side mirrors to detect rear vehicles approaching and in case of the side vehicles or other motorcycles on the sides the rider has to look behind before moving to another lane on the grounds that side perspective mirrors don't see everything and it's greatly affected by poor weather conditions and during night hours.

The main objective of this project was designed and developed for vehicle proximity detection system for motorcycles, the system allows timely detection of the obstacles, the system is to be fast and reliable in delivery of notification hence the data is used to alert the motorcyclists for the safety measures.

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1.0 INTRODUCTION

1.1 BACKGROUND OF STUDY

The automotive industry is mainly focusing on the road safety measures. The automobiles have been constantly updating with new sensing technologies to detect blind spots[1], which can prevent road accidents[2].

Motorcycle accidents on the highways are a big factor of mortality and can cause severe injuries[3], Actually, motorcyclists nowadays are getting more concerned about safety features in their motorcycles and thus are willing to pay the cost of acquiring safer motorcycles. The main threat for a rider on the highway comes from the surrounding cars especially when he is not aware of their close presence. In fact, one of the main features of an on-board motorcycle safety system is to detect the presence of a close car in the rider's rear view, side view, and warn them about it[4].

Riding a motorcycle in modern traffic conditions is highly risky in such a way that riders try to focus on the road since the side mirrors do not properly give a clear view of rear end during riding. This is due to many factors like head rest, pillar obstacle, passenger height among many others and also many accident related cases occur due to the rider's failure to monitor the vehicle approaching from any direction hence this area needs to be monitored and obstacle needs to be detected, this information can help the rider in a lane change situation, bypassing vehicles and other motorcycles, during overtaking since the side mirrors become helpless and there could be a technology to avoid the collision on these areas [4, 5]

In several accidents cases, it has been reported that a third of road related accident cases are caused either by vehicles that bump into motorcyclists from rear end or head to head collision because of a rider's inability to monitor the rear end and vehicles in the adjacent lanes of the road may fall into these areas as well, a motorcyclist may be unable to see adjacent vehicle using only the motorcycle's side mirrors.

The existing systems use the side mirrors to detect rear vehicles approaching and in case of the side vehicles or other motorcycles on the sides the rider has to look behind before moving to another lane on the grounds that side perspective mirrors don't see everything and its greatly affected by poor weather conditions and during night hours. The overtaking of vehicles is a big factor where the accidents happen in these areas.

In the developed system, I am looking at a technical factor, often under looked, but practically significant, that concerns of reduced visibility when the rider has to view side mirrors, consequently leading to loss of concentration on the road thus causing accidents. Since my goal is to eliminate

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