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FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER AND ELECTRICAL ENGINEERING

FINAL YEAR PROJECT

TITLE**: MOTOR CYCLE THEFT CONTROL SYSTEM USING RFID, GSM AND GPS TECHNOLOGY**

BY

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A PROJECT SUBMITTED TO THE DEPARTMENT OF

COMPUTER ENGINEERING IN PARTIAL FULFILLMENT FOR THE AWARD OF A

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING OF

BUSITEMA UNIVERSITY

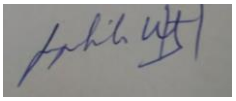
JANURARY, 2023

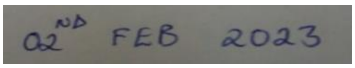
DECLARATION

I KIGAMBIROHA MAUREEN declare that the report being submitted has been written in partial fulfillment of the requirements to the award of a Bachelor's degree of science in Computer Engineering at Busitema University. The work contained in this report is my own, original and has never been submitted to any other institution of learning for any academic award.

KIGAMBIROHA MAUREEN

BU/UG/2018/2199

Signature: 

Date: 

APPROVAL

This is to certify that this final year project under the title "MOTORCYCLE THEFT CONTROL SYSTEM USING RFID, GSM, GPS TECHNOLOGIES" has been under my guidance, supervision and is now ready for examination.

Mr. Matovu Davis

Department of Computer and Electrical Engineering

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I thank the almighty God for life and knowledge that helped me through this project. Appreciation is rendered to my colleagues for their support through group discussions my supervisor, Mr Matovu Davis and the Department of Computer Engineering for guidance and insight into concepts of research and project management as well as technical knowledge applicable in the design of the system. Not forgetting Rudis electronics for availing components, my course mates and FundiBots for providing its robotics laboratory space for building the system.

ABSTRACT

Technology has advanced quickly in recent years. There are many different types of technology that have been invented and offer a lot of ease in daily living, including security systems. In Uganda the mostly used and fastest means of transportation is by motorcycles thus even theft of these automotives has risen thought the years. Motorcycles left unattended on streets or in a parking lot run a significant risk of being stolen. Thieves have learnt away to bypass the ignition system (ignition key) and can easily steal the motorcycle without being noticed. Therefore, there is a need to secure the transmission system and ignition system of the motorcycle.

The motorcycle theft control system will alters the owner immediately the system detects motion (vibration) on the motorcycle, trigger the Alarm then turn off the transmission system with the help of the relay switch thus requiring authentication in order to start off the motorcycle (connect ignition and transmission systems). There so the motorcycle location is obtained using GPS tracking and communication to the owners smart phone using the GSM800L is used. The system has a vibration sensor that will detect vibration that is imposed on the motorcycle. An RFID sensor connected to the microcontroller (Arduino) to the relay that turns on or turns off the motorcycle ignition system thus preventing thieves from riding off the motorcycle. RFID ETKP card is to an individual and gives authentication to the owner to ride off the motorcycle by triggering the relay on which now connects the ignition and transmission systems of the motorcycle . SIM800l GSM Module for sending alert messages when any shock is detected thus triggering an alarm and a GPS tracker for providing information on latitude and longitude coordinates to locate the motorcycle on Google Maps.

Keywords ***Microcontroller; GPS; GSM; RFID; Relay module; motorcycle;***

LIST OF ACRONYMS

GSM - Global System for Mobile communication

GPS- Global Positioning System

ID – Identification

IDE – Integrated Development Environment

IC – Integrated Circuit

IR – Infra red

PCB – Printed circuit board

RFID – Radio Frequency Identification

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CHAPTER ONE: INTRODUCTION

1.0 INTRODUCTION

This chapter includes the background, the problem statement, the objectives, the justification and the scope

1.1 BACKGROUND

There are more people in the world than ever before, and many of them utilize various forms of transportation to go to and from their homes as well as to the gym, bank, workplace, and other destinations. Globally, the economic, social, cultural, and political spheres of various nations have all benefited from transportation. Motorcycle use is the easiest and most popular form of transportation in Africa.

Motorcycles are among the most affordable and practical forms of transportation, but sadly, they are also among the easiest to steal, disassemble, and ship in pieces[1]. Due to the booming motorcycle industry, theft of motorcycles has become a major problem worldwide. Numerous thefts of motorcycles have been reported throughout the years.

In Uganda one of the easiest and fast means of transport is by motorcycles especially in the crowded areas such as Kampala due to a lot of jam. By the end of 2021, the Uganda police Force recorded 43,583 cases 22.2% reported were due to theft[2]. A total of 258 cases of aggravated robbery of motorcycles were reported to Police that year.

Due to the factor that motorcycles are continuously targeted, my system requires authentication to be able to ignite the motorcycle engine on detecting a vibration beyond threshold value on the motorcycle, an alarm is triggered, the transmission system is cutoff, an alert message is sent to the owner on a smartphone notifying the owner of a possible theft threat. The system also features the ability to locate the motorcycle incase its lifted and help ease on the search and recovery. This is possible by the use of GPS and GSM technology, sensors and microcontroller. The owner is able to receive messages and control the entire system through a mobile application in real time.

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