BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

FINAL YEAR PROJECT REPORT

AIR POLLUTION MONITORING AND ALERT SYSTEM

BY

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DECLARATION

I Katusabe Godfrey Reg No BU/UG/2011/83 do 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 06/06/2016

APPROVAL

This project report under the title Air Pollution Monitoring and Alert System has been submitted for examination with the approval and supervision of;

MR. BWIRE FELIX

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Signature 

Date 05/06/2016

DEDICATION

I dedicate this report to all my friends who have helped me throughout this huddle and the department of Computer Engineering.

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ABSTRACT

This report is about the chronological order and the nomenclature which was followed when designing the Air Pollution Monitoring and alert system. The whole process involved identification of the topic to be discussed which led to the formulation of the problem statement. This is succinctly elaborated in chapter one of the report. The literature of the related work was reviewed as well shown in chapter two. It involved gathering of the information relevant to the design of the system. The methodology taken was also clearly elucidated in the preceding chapter three involving thorough explanation on the analysis of the data. The fourth chapter explains clearly the analysis of the system design and gives detailed explanation on the ways through which data was manipulated. The fifth chapter succinctly explains the implementation and testing of the project. The last chapter gives the recommendations and challenges faced during the entire process of designing the system. The air pollution monitoring and alert system is the system designed to monitor the sampled air toxic gases like carbon monoxide, methane and butane. The system consist of a remote sensor system comprising of the LCD for display. This is meant to collect the different gases of interest. It also has the monitoring center consisting of a user interface designed in the Lab VIEW graphical programming language. This software extracts the data sent to it by the GSM modem and depicts it in form of graphical representation which helps in determining the level of the gases. This software is also endowed with cool functionalities like data retrieval and generation of the report to be used by the concerned authority.

LIST OF ACRONYMS

ASIC Application Specific Integrated Circuit

CO Carbon monoxide CO2 Carbon dioxide

CRT Cathode Ray Tube

EEPROM Electronically Erasable Programmable Read Only Memory

FTP File Transfer Protocol GPS Global Positioning System

GSM Global System for Mobile Communication

HTTP Hypertext Transfer Protocol

I/O Input /Output

IQ Intelligence Quotient

KCCA Kampala Capital City Authority

LCD Liquid Crystal Display

LED Light Emitting Diodes

CH4 Methane

NO2 Nitrogen Oxide

O3 Ozone

PM Particulate Matter

RAM Random Access Memory

RF Radio Frequency

SMS Short Message Service

SO2 Sulphur dioxide

VOC Volatile Organic Compounds

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CHAPTER ONE

1.0. Introduction

1.1. Background

Air pollution is the emission of particulates, biological molecules, or other harmful materials into Earth's atmosphere, causing diseases leading to death of humans, and damage to other living organisms such as animals and food crops or the natural or built environment. The atmosphere is a complex natural gaseous system that is essential to support life on planet earth. According to research indoor air pollution and urban air quality are listed as two of the world's worst toxic pollution problems in the 2008 Blacksmith Institute World's Worst Polluted Places report.

Air pollution introduces pollutants in the atmosphere which have adverse effects on humans and the ecosystem. These pollutants can be man-made or of natural origin [1]. They include Carbon monoxide gas mostly from vehicle exhaust, sulfur dioxide, ammonia from factories, Nitrogen oxides, volatile Organic compounds, chlorofluorocarbons, hydrochloric acids and other pollutants.

In Uganda air pollution is increasingly becoming one of the biggest challenges faced, especially in urban centers. It is mainly caused by transport, especially due to rapid motorization that is being experienced in urban centers like huge traffic jam caused by the taxis, motorcycles and other numerous vehicles within the vicinity of the city. The other causes include mining and open waste burning. In addition, air pollutants can be harmful to the human body, and causes complications such as heart disease, respiratory system disease, children's mental retardation, decline in human fertility, or even chronic diseases cause cancers [2].

Therefore, Uganda with a rapid urbanization and economic growth come fears that the number of effected people will increase only in few years to come. This raises a need for a system to detect, monitor and alert air pollution contaminants in the various areas particularly the Cities in the country such that measures can be put in place to curb the rise; therefore Air pollution monitoring System was proposed as a system to help in the analysis and monitoring of the rise of air pollution in the city areas a case study of Kampala Capital City.

The system detects and monitors gas levels of pollution that the findings are shared such that concerned stakeholders can take mitigation measures to reduce the levels of pollution within the city.

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