AN AUTOMATIC MOSQUITO DETECTION AND SPRAYING SYSTEM

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DECLARATION

I KABUNGA HAMEEM, BU/UG/2015/27 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 ……

KABUNGA HAMEEM

BU/UG/2015/27

Date: ……..

APPROVAL

This is to certify that this project report entitled "**AN AUTOMATIC MOSQUITO DETECTION AND SPRAYING SYSTEM**" has been done under my supervision and is submitted to the board of examiners with my approval.

SIGN: …….

DATE: ……

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DEDICATION

I dedicate this project report to my beloved parents Mr. Kabunga Buruhan and Mrs. Nalubega Florence for the love and support they have provided to me throughout this project period, my family and friends for the advice and financial support they rendered to me during the research period.

I also dedicate it to my project supervisor Mr. Odongtoo Godfrey for his tremendous effort and guidance in relation to my project report, the courage, and the moral & support he offered to me during my research period MAY the almighty ALLAH BLESS him.

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ABSTRACT

Malaria is life threatening disease caused by parasites that are transmitted to people through bites of infected female Anopheles mosquitoes, it attacks a person's red blood cells. Malaria remains one of the leading problems of developing countries, and Uganda bears particularly large burden of the disease. This report describes the development of an automatic mosquito detection and spraying system which sprays mosquito insecticide in the room upon detection. A number of research mechanisms were utilized in collecting the kind of data needed to achieve the objectives of the project, the major one was document review which involved reading documentaries whose major source was text books, journals, magazines and newspapers from different scholars and researchers. In this system, highly sensitive condenser microphone is used to collect sounds produced in its surrounding space and conducts output process by electrically converting the collected sounds into collected sound signals. Amplification and filtering was carried out on the collected sound. The collected sound signals was fed to the microcontroller 328p to be processed so that to extract a specific frequency component corresponding to the frequency band of the buzzing sound of mosquito and conducts detection process whether the mosquito exists in space or not based on the extracted signal. In case the mosquito is detected the motorized pump will be activated to spray the room for the given period of time. The liquid crystal display is used to display sound data from the microphone sensor. The ultrasonic sensor is used to determine whether the insecticide in the reservoir is low in order to activate the alarm as a sign that the reservoir needs to be refilled. The developed system ensures that the mosquitoes are detected and room is sprayed immediately to kill them. The system has been tested, validated and proven to work.

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CHAPTER ONE

1.1 BACKGROUND

Malaria is one of the most common infectious parasitic diseases in the world. About 500 million clinical cases of malaria arise each year, resulting in more than 1 million deaths; most deaths due to malaria are infants, children[1] and pregnant women in Africa[2].

In recent days, malaria is most prevalent in tropical developing countries, mainly due to local weather conditions which often allow transmission to occur year around and also an efficient mosquito vector that assures high transmission. About 60% of the cases of malaria and 80% of the malaria deaths occur in Africa south of the Sahara[1]. Over 95% of the malaria cases are due plasmodium falciparum[3].

Malaria is life threatening disease caused by parasites that are transmitted to people through bites of infected female Anopheles mosquitoes. It is a parasitic infection that attacks a person's red blood cells. People infected by malaria parasite will present with symptoms such as chills, high fever, fatigue, headache, nausea, shivering and pain in the limbs. If the infection progresses, a person may develop anemia, jaundice, and low blood sugar. With a particularly strong strain of malaria; a person can develop cerebral malaria, at its most severe, cerebral malaria can induce delirium or seizures and may lead to a coma, "Dr. Joseph Baluku of Mulago hospital explains"[2].

Malaria remains one of the leading problems of developing countries, and Uganda bears particularly large burden of the disease[4]. Uganda has made progress in implementing key malaria control measures, in particular distribution of insecticides impregnated nets, indoor residual spraying of insecticides, utilization of artemisinin-based communication therapy to treat uncomplicated malaria, and provision of intermittent preventive therapy for pregnant women. However, despite the enthusiasm regarding the potential for the elimination of malaria in this area, there is no convincing evidence that the burden of malaria has decreased in Uganda in recent years[4].

In Uganda, statistics from the ministry of health show that malaria is still leading cause of death in Uganda accounting for over 27% of deaths. The statistics also show that Uganda has the highest malaria incidence, with rate of 478 cases per 1,000 population per year[5].

REFERENCES

[1] S. I. Hay and R. W. Snow, “The Malaria Atlas Project: Developing Global Maps of Malaria Risk,” *PLoS Med.*, vol. 3, no. 12, p. e473, Dec. 2006.

[2] “Malaria Leading Cause Of Death In Uganda.” [Online]. Available: https://www.newvision.co.ug/new_vision/news/1423973/malaria-leading-cause-death-uganda. [Accessed: 07-Oct-2018].

[3] M. Nanyunja, J. Nabyonga Orem, F. Kato, M. Kaggwa, C. Katureebe, and J. Saweka, “Malaria Treatment Policy Change and Implementation: The Case of Uganda,” *Malar. Res. Treat.*, vol. 2011, pp. 1–14, Sep. 2011.

[4] A. Yeka *et al.*, “Malaria in Uganda: Challenges to control on the long road to elimination,” *Acta Trop.*, vol. 121, no. 3, pp. 184–195, Mar. 2012.

[5] “Malaria in Uganda,” *Who*. p. 1500, 2015.

[6] “CHAPTER ONE: INTRODUCTION AND BACKGROUND TO THE STUDY - PDF.” [Online]. Available: https://docplayer.net/25570711-Chapter-one-introduction-and-background-to-the-study.html. [Accessed: 14-Nov-2018].

[7] “Permethrin General Fact Sheet.” [Online]. Available: http://npic.orst.edu/factsheets/PermGen.html. [Accessed: 09-Nov-2018].

[8] “Mosquito Insecticide - Mosquito World.” [Online]. Available: http://www.mosquitoworld.net/mosquito-control/insecticide/. [Accessed: 09-Nov-2018].

[9] “Amazon.com : Cube PRO Pynamite Mosquito Misting System, small 26 inch cube still 55 gallons with 30 Nozzle Kit and FREE Misting Concentrate : Garden & Outdoor.” [Online]. Available: https://www.amazon.com/Pynamite-Mosquito-Misting-gallons-Concentrate/dp/B016ARREB4. [Accessed: 18-Nov-2018].

[10] “Best mosquito misting and control systems | INSECT COP.” [Online]. Available: https://insectcop.net/best-mosquito-misting-systems/. [Accessed: 18-Nov-2018].

[11] “Amazon.com : Automated Mosquito Misting System - 10 Nozzle Mosquito Control System - Do It Yourself Mosquito System (10 Nozzle System - 30 Gallon Tank) : Garden

& Outdoor.” [Online]. Available: https://www.amazon.com/Automated-Mosquito-Misting-System-Yourself/dp/B074MKJ3BL. [Accessed: 18-Nov-2018].