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DEPARTMENT OF COMPUTER ENGINEERING AND INFORMATICS

FINAL YEAR PROJECT 2022/2023

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DESIGN AND IMPLEMENTATION OF A THREAT DETECTION AND NOTIFICATION SAFETY SYSTEM FOR A PERSON UNDER THREAT

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A project Report Submitted to the Department of Computer Engineering and Informatics in Partial Fulfillment of the Requirements for the Award of a Bachelor's Degree in Computer Engineering from Busitema University.

APPROVAL

This is to certify that this report has been compiled by **NAMAKOYE JOAN** Registration Number **BU/UP/2019/1197** under the supervision and guidance of the University supervisor. It is now ready for submission to the Department of Computer Engineering.

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DECLARATION

I **Namakoye Joan, BU/UP/2019/1197** a student of Busitema University, hereby declare that the presented proposal report is uniquely prepared by me after thorough research work at Busitema University. I also confirm that this proposal report has been written by me and has never been submitted to any academic institution.

SIGNATURE .....

DATE 18/07/2023

ACKNOWLEDGEMENT

I have taken efforts in this project report. However, it would not have been possible without the kind support and help of many individuals and Staff of Busitema University's computer engineering department. I would like to extend my sincere thanks to all of them especially DR. Mirondo, Professor Ocen Gilbert,

First and foremost, I would want to thank my sis Mutonyi Lydia, my father who have supported me financially and socially through the guidance they gave me throughout my report writing.

ABSTRACT

Now days, insecurity is on the rise due to a number of factors including but not limited to drug abuse, high population growth, urbanization, and unemployment among others. Moreover, incidents of insecurity such as kidnap, rape, burglary and sexual harassment are usually experienced by vulnerable people such as women, elderly, and children who may not be in position to fight off perpetrators. In this way, when faced by such incidents, these have to rely on external support in order to be rescued. However, achieving this necessitates a number of aspects: First, there should be a mechanism or a distress signal to alert the rescue agency that the victim is under a security threat. Such an agency could be the police, ambulance, friend, parents, among others.; Secondly, there should be a mechanism for the rescue agency to know the real-time location of the victim; Thirdly, in case of need for prosecution of perpetrators, there should be a mechanism to capture evidence that may be used to trace the perpetrators.

Given the above, this proposal seeks to design and implement a system capable of sending a distress signal whenever a person is under a security threat including the real time location of the victim even under cases of mobility such as kidnap. Additionally, the system incorporates an imaging unit which is able to capture the scenery in which the threat is taking place. Such information can then be used for evidence gathering and analysis for possible prosecution.

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LIST OF ACRONMY

LCD Liquid Crystal Display

GSM Global System for Mobile Communication

GPS Global Positioning System

SMS Short Message Service

IDE Integrated Development Environment

CHAPTER ONE

1.1 Background

Safety refers to the condition of being protected from harm, danger, or risks It is a fundamental aspect of human life that consists of various measures and precautions taken to prevent accidents, injuries, and harm to individuals and communities (Pavithra & Devi, 2018). It is a multidimensional concept that consists of physical, psychological, and emotional well-being.

Due to the high and increasing population in Uganda, there has been a noticeable increase in crime and security that can be attributed to factors such as urbanization, high unemployment rates, drug abuse and alcoholism, among others. Crimes such as robbery, kidnap, rape, murder, and sex trafficking among others and the crime rates in Uganda are not decreasing but in fact increasing at a very high rate (Nandhini et al., 2018).

Moreover, it has been observed that women have remained the most vulnerable to these attacks and threats as they are considered to be of weaker sex, hence not in position to fight off the perpetrators of these security threats. For instance, following the 2020 annual crime report released by the Uganda Police Force, there were 1437 reported cases of rape in Uganda between 2016 and 2020 It is important to note that these are only reported cases and that actual number of sexual assault cases is likely to be higher due to under reporting [2].

According to Daily Monitor, Mr. Emilian Kayima, by then (2018) the police spokesperson said 25 cases were reported in three months, five ended up in the murder of the victims. Some of the victims include Charity Kyohirwe, 32, a resident of Masajja Parish in Makindye Division, and a 19-year-old girl Brinah Nalule. The trend overshot after the infamous kidnap of Suzan Magara, a 28-year-old cashier, whose body was found on the Southern Bypass in Wakiso District after 20 days in captivity.

In August 15 2022 the Uganda police says, the Directorate of CID in close coordination with Directorate of Operations, Crime Intelligence and Greater Masaka Police, had in custody 4 suspects, highly linked to the alleged kidnap, trafficking with intent to forcefully marry, a 14-year-old girl victim from Kabuta LCI village, Mayanja Parish, Kakuuto Sub- County, in Kyotera district. The 4 suspects include; Kiggundu Augustine, Musiri Geoffrey, who actively participated in the kidnap while still putting on the

6.5 Challenges

Some components such as the microcontroller stopped reading on a laptop which incurred me extra costs

I faced the financial challenges as getting money to buy components was not easy

6.6 Conclusion

As I have designed it for vulnerable people's Safety it is very use full for them to send their location to their Parents or Family, whenever they are in danger by exerting pressure on the flex sensor they can easily send their location link or coordinates of location. So their family can easily reach to them and can provide help to them. This will reduce the crime rate against the vulnerable and also they will feel safe.

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9) *Daily Monitor https://www.monitor.co.ug › Home › News › National*

APPENDICES

```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd (0x27, 16, 2);

#include <SoftwareSerial.h> SoftwareSerial
sim800l (10, 11);
#include <SoftwareSerial.h>
#include <TinyGPS.h>
SoftwareSerial mySerial (7, 8); TinyGPS
gps;
void gpsdump (TinyGPS &gps);
void printFloat (double f, int digits = 2);

int PulseSensorPurplePin = A2;     // Pulse Sensor PURPLE WIRE connected to ANALOG PIN
0
int Signal;                // holds the incoming raw data. Signal value can range from 0-1024

int flex = A3;
int led = 2; int
buzzer = 3;

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);         // Set's up Serial Communication at certain speed.
```