

**RAPE DETECTION AND PREVENTION SYSTEM USING IOT AND MACHINE LEARNING**

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An information system project proposal submitted to the faculty of information technology in partial fulfilment of the requirements of the award of a degree in Information and Computer science.

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# Abstract

Gender based violence has become a prevalent disorder in the society. There exist many forms of gender based violence for instance; violence at home, abuse of the victims and sexual violence. Sexual violence is a recurring critical issue that continues to trouble the society. However, there are actions that have been taken to suppress the situation but most of the incline to be unsuccessful.

The victim often fall prey when they are alone or highly intoxicated because the vulnerability level is high. Thereafter, when the victim tries to reach out to people or report the incident to the police, the response time tends to be long and hence the victim becomes hopeless for justice which results to suicide, early pregnancies and family conflicts.

The proposed system is intended to reduce the number of victims. By incorporating both IOT and Machine Learning, there will be sensors to check the pulse rate and detect alcohol and module GSM and GPS modules that will facilitate communication. A body movement model will be used to detect any signs of physical struggle and later a report will be generated with regards to the data collected. The report will be sent to the clinic for evidence.

The methodology used will be prototyping because I will use my own data set.

# Chapter 1: Introduction

## Background

Gender based violence (GBV) is violence against women based on women’s inferior status in society which is considered to be a human rights violation. According to United Nations General Assembly in 1993, it takes forms such as Physical, sexual and psychological violence within the family, Trafficking in women, Female genital mutilation and sexual abuse (Centre, 2014). It can be enacted by members of an army, terrorist organization or just a civilian.

The data availed at the Centre’s Website indicates that since 2001 to date, the Centre has supported over 21,341 survivors of GBV, of whom 56% were women, 36% girls, 3% men and 5% boys. In Kenya, 45% of women aged between 15 and 49 years have experienced either physical or sexual violence; One in five Kenyan women (21%) has experienced sexual violence. Most violence is perpetrated in familial relationships where the perpetrator is known to the victim, strangers account for only 6% of GBV in Kenya and most violence towards women is committed by an intimate partner, (Centre, 2014)

There are sites for GVB;

Community/Society- This is a group sharing common social, cultural, religious or ethnic belonging, it perpetuates existing family structure and power inequalities in the society. It justifies the behaviour of male abusers aimed at establishing control over women and supports harmful practices in the workplace.

Family- This is the arena where physical abuses (spousal battering, sexual assault, sexual abuse) and/or psychological abuses occur. Domestic violence can also take such forms as confinement, forced marriage of woman arranged by her family without her consent, threats, insults and neglect. Given that violence within the family and household takes place in the home, it is often seen as a ‘private’ issue and information about it is lacking. ( Minnesota Advocates for Human Rights, 2003).

In 2007 Kenya experienced post-election violence which brought a lot of disorder amongst its citizens. there were extremist groups or malicious individuals that would go from house to house, to torture the inhabitants; destroy their belongings and even to an extreme of sexual violence women. This was to impose punishment due to the ethnical classes and some would take advantage of the fact that measures were not being and also people lived in and hence the women couldn’t defend themselves.

Alcohol and drug abuse such as cocaine influence an individual’s tendency towards violence. The respondents of the 1991 National Criminal Victimization Survey perceived more than one fourth of violent criminal assailants to be under the influence of alcohol, less than 10% of these assailants were reported by victims to be under the influence of illicit drugs. Of these, more than half were reported to be under the influence of both alcohol and drugs (Parker & Auerhahn, 1998).

Often the rape cases take a while before they are taken to trial and the manner they are dealt with is contrary to the seriousness it requires. The of the survivors struggle to maintain their composure when confronted with their memories of the violence (Review, 2014). They are expected to show less emotions and give elaborate answers and descriptions when confronted with questions or objectivity to because these cases are normalised to sex. This discourages the victims from reporting the case in addition to it, stigmatisation from the society.

The numbers of unemployed youth are increasing to a point they would opt to commit crime in order to gain money for sustainability purposes. In the midst of all this, they commit sexual violence depending on the victim in this case being the women.

There have been cases of women being abducted and held hostage or sold to different countries lieu of payment. A different instance though rare in Kenya, the recruitment of women and promise them marriage and wealth, in such the women lured and fall prey to these false proposition. The ones behind this are highly capable of orchestrating sexual violence and sometimes end up killing the victims. (Bigio & Vogelstein, 2017)

## Problem Statement

Broken families

Psychological Aggression

denigration of one’s partner is intended to result in damage to selfesteem/self-concept, likely leading to depression or anxiety; (b) withholding affection and nurturance is aimed at damaging self-esteem but is also a manipulative ploy to produce submissiveness, probably leading to depression, learned helplessness, and/or a passive personality style; (c) threatening actions are intended to frighten/intimidate, thus leading to anxiety, compliance, and passivity; and (d ) restriction intends to control the partner’s actions, potentially leading to depression, passivity, and lack of sociabilit (Jordan, Campbell, & Follingstad, 2010)

Emotional reactions y Guilt, shame, self blame y Embarrassment y Fear, distrust y Sadness y Vulnerability

Physical reactions y Changes in eating or sleeping patterns y Concerns about physical safety y Physical injury y Concerns about pregnancy or contracting an STI or HIV

Community

Schools, workplaces, neighbourhoods, campuses, and cultural or religious communities may feel fear, anger, or disbelief if a sexual assault happened in their community. Additionally, there are financial costs to communities. These costs include medical services, criminal justice expenses, crisis and mental health services fees, and the lost contributions of individuals affected by sexual violence (© National Sexual Violence Resource Cente, 2010)

(Justice and Gender-Based Violence, 2013)

## 1.3 Aim

To develop an application that detects and prevents women from being assaulted hence reduce sexual violence in Kenya.

## 1.3.1 Specific Objectives

1. To investigate the challenges faced by women before they become sexual violence victims
2. To review the existing solutions that prevent sexual violence from occurring and also help the victims to cope up with the outcomes.
3. To design, develop and test an application that prevents women from being assaulted.

## Research questions

1. What are the challenges faced by women before they become sexual violence victims?
2. What are the existing solutions?
3. How to design, develop and test an application that prevents women from being assaulted?

## Justification

The system focuses on the physical security, it helps to inform a group of people, enlisted by the user, to know the location of the user in case she feels unsafe. This will make it easier to make the case or issue come to light because more people are aware of what is happening and are able to go the physical location, if not, they can also request the police for aid, this way the response time is reduced by a high percentage.

Real time data analysis

## 1.5 Scope and Limitation

Some of the major cities in Kenya are Mombasa Kisumu and Nairobi, given that Nairobi is a densely populated urban area, there tends to be a high rape cases, with a record of 24.5 per cent. (Daily Nation, 2019). With a population of 4,734,881 (World Population Review, n.d.), there is a high rate of unemployment and also drug and substance abuse by the youth this also affects the crime rate in the city. Age)

It can include security, domestic violence

Limitations: The victims are hard to approach given that they may be experiencing stigmatisation, Post S Traumatic disorder, social isolation or depression so they may shy away from being because they feel ashamed or are fearful of what may be said about them. The researchers as well will have difficulties in obtaining sensitive information hence they need to be trained for such occurrences

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