



DESIGN OF HUMAN RECOGNITION AND SELF DEFENCE SYSTEM

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ABSTRACT

Women and child kidnapping is the one of the widespread crime increasing each year. Child care is the critical issue in solving this epidemic. This is due to lack of evidences the most of the cases remain mystery. Various systems and methods were been implemented to solve this problem. In this paper we present the combined infrastructure of hardware used prevent and safeguard the people from the danger. The wrist band consists of the controller interfaced with GPS/GSM kit. The band will also be interfaced with preventive mechanisms like electric shock, spray model and alarm. A human action would initiate the system. On initiation the alert message were sent to the control room and the parents. The exact location of the victim has been traced and the information is sent to concerned person. This alert system can also be used for medical emergency.

Keywords-*location tracking, GPS/GSM, arduino*

I. INTRODUCTION

At this present world child and women safety become a great issue as they can't step out of their house due to physical harassment, kidnapping and fear of violence. The world is becoming unsafe for everyone. According to the reports of WHO, NCRB-social government organization says 40% of women were facing lot of unethical problems in public places. In 2012 National Crimes Records Bureau of India, has reported the crimes against women have increased by 6.4%. The statistics of NCRBI shows that every three minutes a crime is committed against women. In 2011, women have been registered complaints of 228,650. The crime seems to be rising in an alarming

rate. Around 244,270 crimes against women were been reported in India alone. And some of the cases were been unregistered due to fear, social stigma attached and suppressed. Among the 8,000 missing children only one-third of the children were found. While the police have a list of reasons for child disappearance, there are no known causes for more than 1,700 children, one-fifth of the total. The fear of child abduction is very real. It is the feel of parents do not able to cope up with. Many kidnapping cases result in unethical harassment, murdering, robbery. The number of cases were increasing each year. However, a lot of the number of cases go unsolved, which means that neither the criminals involved nor the child is found. The child should taught the basic things, how to

behave at the outside world like to approach the strangers, not to do what they ask them to do, not to eat what they give. But this but this will not give assurance to guarantee their safety. The most public place the children get lost were seashore, malls, theatres, markets etc, where it is usually crowded. Thus some of the authorities made to solve this problem by fixing the CCTV cameras at the respective places, but this seems to be not much effective. There is a universal truth applicable to all counties **‘II. violence act against the women is never acceptable, never excusable, and never tolerable.’**

The report of WHO states that a violence act against female gender disturbed the public health life society and it also violates the human rights of women. This situation has to be changed. Sometimes the children or adult gets lost by themselves, by going to wrong direction and getting somewhere where there is no one to help

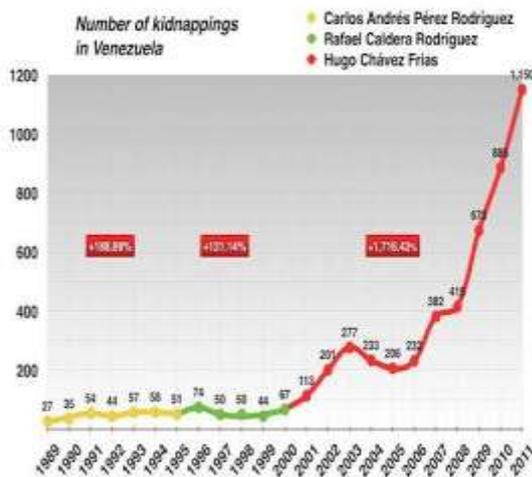


Figure- Crime rates in Venezuela.

them. If there some application to track the location the child it will be more effective to rescue the children. If the location has been traced, soon after getting the report of child missing the police officials could take necessary measures to help the child. A better tracking system will help the authorities to help to solve these cases. The major reason for increase in rape statistics is the nonexistence of suitable surveillance system to ensure the safety of women.

With the figure pointing out that women and children are subjected to such atrocities, physical and unethical issues there is a need to have the device that would help them to alert someone in the case of emergency. Advances in telecommunication technology in recent years has been rapidly developed. By using such applications we can safe guard the people.

EXISTING SYSTEM

This paper proposes an automatic cum manual device which would help the victim to alert others during emergency situation by alert messages. The prototype can be turned ON by an action of human hand (by twisting of wrist) and it can also be turned on manually. This is made because the victim will not always have the freedom to turn the system ON. Camera has been attached to somewhere in the body which sends the live streaming video to the control room in the interval of 30 seconds until the system is reset. Meanwhile, the GSM would start sending the panic message to the phone numbers already stored.

The person at the other end will be monitoring the location with Google maps app that would locate the victim location. The size of the factor is considered to be another pivotal factor that we cannot determine. This is because the armband must be less prominent and visible to others. The processor used in this paper was ARM7 processor. Even it produces better efficiency, but it leads to high cost. Hence the product cannot reach the people.

SYSTEM DEVELOPMENT

The system can be initiated either manually or automatically. As the relay is turned on the victim may oppose the criminal with safety mechanisms. At the same time the alert message has been sent to the person whom they need to intimate. By tracking the location through GPS/GSM technology,

the exact location of the victim has been found out and rescued. Thus this system can be used at various emergency situations.

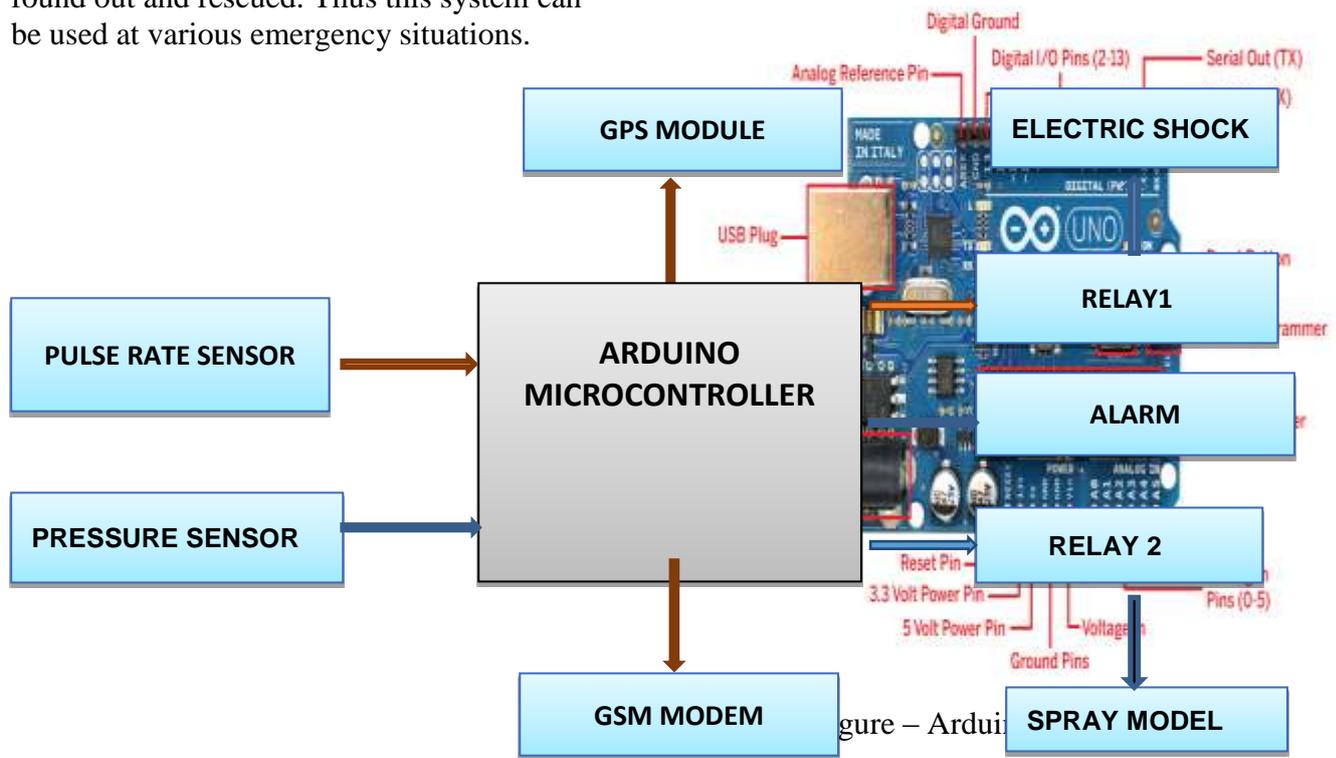


Figure – Block diagram of proposed system

A. Major building blocks to realize this self defence system

The various components required to realize this product are Arduino Uno, electric shock, spray model, GSM MODEM, GPS receiver, virtual terminal. These description were discussed in below subsequent sections.

B. Arduino Uno

The Arduino Uno is a low power 8-bit AVR microcontroller board based on the ATmega328 with flash memory. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHZ ceramic resonator, a USB connection, a power jack, an In-Circuit Serial Programming(ICSP) header, and a reset button. It contains all the features needed to support the microcontroller. By simply plugging it to a computer with USB cable or power it with AC to DC adapter or battery to start working.

Dual band GSM MODEM

The GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own ideal number. It requires the SIM card and a connectivity to the GSM network. It can also be used in GPRS mode to connect to the internet and use all the applications for the data logging. It is a wireless MODEM and can send and receive data through the GSM network.



Figure – GSM modem SIM 900

C. GPS receiver

GPS stands for Global Positioning System. The purpose of using this module in the system is it continuously transmits serial data like position of an individual wearing sensor, in terms of latitude and longitude, data, time and speed values to processing unit. Global Positioning System is a network of satellites that continuously transmit coded information, which makes it possible to precisely identify locations on earth by measuring distance from the satellites.



Figure – GPS receiver section

D. Power supply unit

The power supply unit has to provide a regulated D.C supply to all sections of the system. As it is essential to produce the instrument of batteries since it is used with the person moving. It has high portability. It consists of rechargeable batteries, voltage regulators and filter capacitors. The microcontroller has the capability of handling only 5V. But the power supply given to the circuit is about 12V. In this case the voltage regulator will regulate the voltage and produce it to the controller section. The batteries can be charged by a regular charger. The components like microcontroller, pressure sensor, pulse rate sensor, comparator, GSM modem, GPS receiver. The electric shock circuit require 12V dc supply. A regulated power supply unit is built to provide all voltages at maximum current capacity.

E. Emergency keys

Emergency manual keys have been used to prevent the crime. A key has been defined for necessary carrying of event to the micro controller and the peripheral.

But some time emergency keys operation by manually will have failure, in that incident the victim person may not able to operate those manual keys. In that case pulse sensor and the pressure sensor plays important role to reduce failure of manual keys. Manual keys will be responsible for horn communication, GSM/GPS based communication and for preventive action.

IV. SYSTEM DESCRIPTION

The system can be initiated either manually or automatically. As the relay is turned on the victim may oppose the criminal with safety mechanisms. At the same time the alert message has been sent to the person whom they need to intimate. By tracking the location through GPS/GSM technology, the exact location of the victim has been found out and rescued. Thus this system can be used at various emergency situations.

The project is divided into two parts

- Prevention of incident
- Communication of the incident

PREVENTION SIDE:

The prevention of molestation, kidnapping, murder are the most important events on the communication sector. To prevent above mentioned incidents various techniques are being used such as spray model, electric shock, alarm.

Electric shock

The concept of implementing a small circuit which provides the electric shock to the attacker and simultaneously the alert messages were sent to the concerned officials. However the shock intensity is so adjusted that it deters the attacker. This can

be carried out several number of times. It is the portable device which can be carried easily. A switch is provided in order to enable and disable the electric shock circuit. Once the switch is enabled the electric shock circuit will affect the attacker to lose his energy. At the same time simultaneously the alert message is sent to the concerned officials.



Figure – Electric shock boost circuit

Spray model

The spray mechanism consists of the tin which is composed with pepper spray or any other types of irritation liquids. It is also connected with the switch to enable and disable the mechanism. It can be again refilled to oppose the criminal. This can be triggered by stepper motor. The stepper motor consists of 180 degree rotation. We can set the rotation with our required degree. A single switch is allocated for both spray model and shock circuit. The switch can be enabled manually or either automatically.

Security Alarm

The alarm is designed to assist in alerting somebody in case of emergency situations in order to threat to the attacker or properly exists. The alarm can also be initiated by the victim by pressing the switch or enabled automatically.



Figure – Stepper motor

The sensors at the transmitter side

- Pulse rate sensor
- Pressure sensor

Pulse rate sensor

It plays an important role to have controller action to use preventive measures automatically. Preventive tools like spray mechanism and shocking mechanism will be automatically turned on to get relief from criminal. Controller will have next priority to process data through GPS/GSM model. The controller takes data from pulse rate sensor and it will act as per status of pulse. In normal situation pulse rate of human being is constant but whenever there is a psychological incidents, that status won't produce constant pulse rate of the heart. In that condition signal comparison will be carried out by micro controller, hence if there is a problematic situation, for the person at that time that pulse rate plays important role to have further process of that system.

Pressure Sensor

Two pressure sensors are being used for different task. The function of the pressure sensor is to convert pressure into electrical pulse which is given to the microcontroller.

For following cases pressure sensors are useful

- a) *At the time of molestation.*
- b) *When user is not able to oppose to the criminal.*

Case 1:

At the time of molestation pressure sensor will convert pressure into electrical signal and the signals will pass to the controller to have expected events to be carried out as per priority.

Case 2:

When user is not able to oppose to the criminal, pressure can be converted into electrical signal and then it can pass to

controller to have expected events to be carried out as per priority.

V. IMPLEMENTATION

The prototype proposed for the human safety recognition system is realized using the arduino microcontroller. In case of failing to initiate the switch we have provided with sensor mechanism which will tend to enable the circuit automatically. This is anticipating the chances of fall when attacked or assaulted. The basic structure of prototype circuit is given below.



Figure – Basic block of prototype

Once the switch is initiated the GPS receiver shows the location of latitude and longitude details to be sent. The GSM module sends the panic messages along with the location details to the pre determined control station. Every time the location of latitude and longitude changes the message is sent. This helps to track the victim in accurate location.

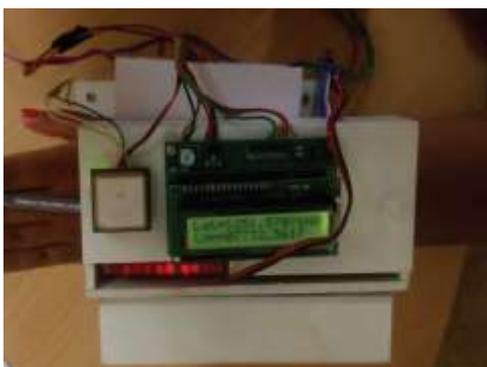


Figure - GPS location is determined by location



Figure – Received coordinates to pre-determined control station.

VI. CONCLUSION

The salient features of this product are less hardware components, low power consumption and low cost. This system will be helpful in identifying women children, mentally challenged people, senior citizens etc.. Our future work shall be to propagate about human recognition system to general public and request police stations and other gatherings to considerd to use of this system. This system can also be used at medical emergency situations.

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