International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353 Volume 25 Issue 5 – APRIL 2018 (SPECIAL ISSUE).

ALERT SCHEME USING MEMS AND GSM FOR WOMENS SAFETY

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***Abstract*- Raspberry Pi** is a tiny credit card size computer. Add a keyboard, mouse, display, power supply, micro SD card with installed Linux Distribution and you'll have a fully-fledged computer that can run applications from word processors and spreadsheets to games. "New Alert Scheme" is one such implementation aimed at improving the needs for womens safety. The previous system includes sending the alert intimation as a text message such as increasing atrocities on womens and children. Most of the cases remain mystery because of lack of evidences or them being weak, this method is not efficient. Whereas, In the proposed system, the above problems are overcome by using MEMS sensors and GSM to provide voice call and location to be shared to the predefined mobile station. In this techniques we also given with an option of switch button to activate the system. The armband would have a controller with GSM kit interfaced. Since change in Longitude and Latitude is sent continuously, the person can be tracked. The proposed system is designed also to be used as an alert system during medical emergency. In the accidental place they need medical help as soon as possible.

***Index Term*:** sensor system integration, service functions and management, MEMS,GSM

1. Introduction

The **Raspberry Pi** is a series of small single-board computers developed in the United Kingdom by the Foundation to promote the teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated, selling outside its target market for uses such as robotics. It does not include peripherals such as keyboards, mice and cases. However, some accessories have been included in several official and unofficial bundles. The wearable safety device for the women and the elderly peoples.Currently there is some complex systems are available to intimate accidents occurring for the humans. Due this there are possibilities of threats like loss of life due to a small reason i.e., no proper medical attention within the golden hour .Sending the alert intimation as a text message. In case, If the message will not delivered successfully or it will take too long to delivered then there is no use. Peoples cannot go anywhere without any security.

Women need some security for their protection. There is only a text message SMS

will be send to the care takers or a mobile users. There is no use, if the user/receivers will not see that message. Using GPS and GSM modem make the system more complex and costly. If the SMS will not send/delivered on the time, then the system will be fail. Most of the cases remain mystery because of lack of evidences or them being weak .These social evils are becoming major stumbling blocks that preclude India's development. By increasing density of cells in an area, one can achieve high nicety in locating the device [10 A system that would aid the victims to send a panic and alert message along with call. The armband would have a controller with GSM kit interfaced. The system is designed also to be used as an alert system during medical emergency.

2. Related Works

2.1 MEMS

Micro-Electro-Mechanical Systems (MEMS) Technology is one of the most advanced technologies that have been applied in the making of most of the modern devices like video projectors, bi-analysis chips and also car crash airbag sensors. This concept was first explained by Professor R. Howe in the year 1989. Since then many prototypes have been released and revised and has thus become an integral part of the latest mechanical products available in the market today. During its early stage, the MEMS chip had two parts. Onepart included the main structure of the chip and the other part included everything needed for signal conditioning. This method was not successful as the total space taken by the device was larger, and thus the different parts of a single chip needed multi-assembling procedures. The output obtained from such a device had less accuracy and the mounting of such a device was difficult. As the technology became more advanced the idea of integrating multi-chips was applied on to produce a single chip MEMS with high performance and accuracy. The main idea behind this technology is to use some of the basic mechanical devices like cantilevers and membranes to have the same qualities of electronic circuits. To obtain such a concept, micro-fabrication process must be carried out. Though an electronic process is carried out, an MEMS device cannot be called as an electronic circuit. MEMS duplicate a mechanical part and have holes, cantilevers, membranes, channels, and so on. But an electronic circuit has a firm and compact structure. To make MEMS from silicon process, the manufacturer must have a deep knowledge in electronics, mechanical and also about the materials used for the process.

2.2 ADC

Analog-to-digital converter (ADC, A/D, A–D, or A-to-D) is a system that converts an analog signal into a digital signal. A digital-to-analog converter (DAC) performs the reverse function. An ADC may also provide an isolated measurement such as an electronic device that converts an input analog voltage or current to a digital number proportional to the magnitude of the voltage or current. Typically the digital output will be a two's complement binary number that is proportional to the input, but there are other possibilities. There are several ADC architectures. Due to the complexity and the need for precisely matched components, all but the most specialized ADCs are implemented as integrated circuits. Analog-to-digital conversion is an electronic process in which a continuously variable (analog) signal is changed, without altering its essential content, into a multi-level (digital) signal. The input to an analog-to-digital converter (ADC) consists of a voltage that varies among a theoretically infinite number of

values. Examples are sine waves, the waveforms representing human speech, and the signals from a conventional television camera. The output of the ADC, in contrast, has defined levels or states. The number of states is almost always a power of two -- that is, 2, 4, 8, 16, etc. The simplest digital signals have only two states, and are called binary. All whole numbers can be represented in binary form as strings of ones and zeros..Digital signals propagate more efficiently than analog signals, largely because digital impulses, which are well-defined and orderly, are easier for electronic circuits to distinguish from noise, which is chaotic. This is the chief advantage of digital modes in communications. Computers "talk" and "think" in terms of binary digital data; while a microprocessor can analyze analog data, it must be converted into digital form for the computer to make sense of it. A typical telephone modem makes use of an ADC to convert the incoming audio from a twisted-pair line into signals the computer can understand. In a digital signal processing system, an ADC is required if the signal input is analog

2.3 GSM

GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.GSM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64 kbps to 120 Mbps of data rates. There are various cell sizes in a GSM system such as macro, micro, Pico and umbrella cells. Each cell varies as per the implementation domain. There are five different cell sizes in a GSM network macro, micro, pico and umbrella cells. The coverage area of each cell varies according to the implementation environment.TDMA technique relies on assigning different time slots to each user on the same frequency. It can easily adapt to data transmission and voice communication and can carry 64kbps to 120Mbps of data rate.

3. System Analysis

In Existing System, The wearable safety armband for the women's and the elderly peoples .Currently there is some complex systems are available to intimate accidents occurring for the humans. Due this there are possibilities of threats like loss of life due to a small reason i.e., no proper medical attention within the golden hour. In existing, we are sending the alert intimation as a text message. In case, If the message will not delivered successfully or it will take too long to delivered then there is no use. Hence we are proposing a new technique to intimate the accidents to the control room of medical Centerior care takers, as early as possible and location also. The disadvantages are

- Peoples cannot go anywhere without any security.
- Women's need some security for their protection.
- There is only a text message SMS will be send to the care takers or a mobile users.
- There is no use, if the user/receivers will not see that message.

Here we proposed, which enables the full process tracking The person can be tracked. The system is designed also to be used as an alert system during medical emergency. The biggest plight of a victim is feeling of incapacitation. Women have always been the soft targets and face such horrendous crimes. In such cases we often hear the victim quoting that if she could have contacted someone, then the misery could have been avoided. Cell Tower Triangulation method uses serving cell tower and neighboring cell tower to track the location of user by obtaining radio measurements from the GSM modem. If a panic switch is pressed then GSM sends an SMS to the Emergency number and with the location. Then a call is provided to the emergency contact. This will be a much simpler and low cost technique compared to others.The advantages are,

- The system is efficient and reliable.
- The use of RASPBIAN OS system is portable and compact.
- The system is low cost and simple.
- This method is widely used in safety and the security system.

4. System Design

In the previous system The pattern for the existence is send alert message alone.Alert intimation is attached with the MCU via RS232 interface.GSM is enabled to track location and also send text SMS.MEMS sensor is connected to the microcontroller. on variation in human body MEMS informs to controller.Using voice IC, controller play voice call to predefined user.Conroller will automatically redial to user until reciever picks up call.This will be a much simpler and low cost technique compared to others, thus saving lots of human life. The system is efficient and reliable.The use of RASPBIAN OS system is portable and compact.The system is low cost and simple.This method is widely used in safety and the security system.

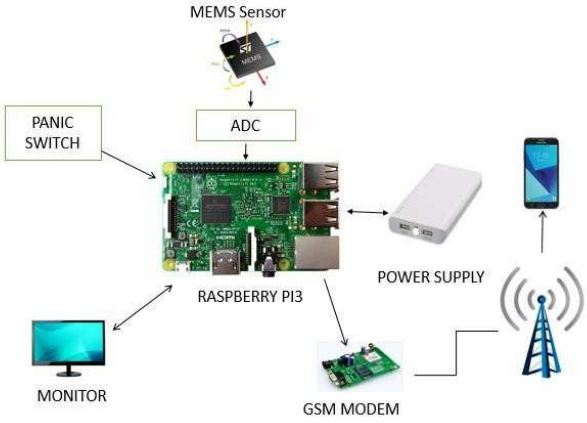

Fig 4.1 System Architecture

4.1 RASPBIAN OS

RASPBIAN is a Debian-based computer operating system for Raspberry Pi. Since 2015 it has been officially provided by the Raspberry Pi Foundation as the primary operating system for the family of Raspberry Pi single-board computers. Raspbian was created by Mike Thompson and Peter Green as an independent project.[3] The initial build was completed in June 2012.[4] The operating system is still under active development. Raspbian is highly optimized for the Raspberry Pi line's low-performance ARM CPUs.

Raspbian uses PIXEL, **P**i **I**mproved **X**windows **E**nvironment, **L**ightweight as its main desktop environment as of the latest update. It is composed of a modified LXDE desktop environment and the Openbox stacking window manager with a new theme and few other changes. The distribution is shipped with a copy of computer algebra program Mathematica and a version of Mine

craft called Mine craft Pi as well as a lightweight version of Chromium as of the latest version.

5.3.1PYTHON

Python is a widely used high-level programming language for general-purpose programming, created by Guido van Rossum and first released in 1991. An interpreted language, Python has a design philosophy that emphasizes code readability (notably using whitespace indentation to delimit code blocks rather than curly brackets or keywords), and a syntax that allows programmers to express concepts in fewer lines of code than might be used in languages such as C++ or Java.[23][24] The language provides constructs intended to enable writing clear programs on both a small and large scale.[25]Python features a dynamic type system and automatic memory management and supports multiple programming paradigms, including object-oriented, imperative, functional programming, and procedural styles. It has a large and comprehensive standard library.[26]Python interpreters are available for many operating systems, allowing Python code to run on a wide variety of systems. C Python, the reference implementation of Python, is open source software[27] and has a community-based development model, as do nearly all of its variant implementations. C Python is managed by the non-profit Python Software Foundation.

4.2 POWER SUPPLY

The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op–amp. The advantages of using precision rectifier are it will give peak voltage output as DC, rest of the circuits will give only RMS output. **Bridge rectifier**When four diodes are connected as shown in figure, the circuit is called as bridge rectifier. The input to the circuit is applied to the diagonally opposite corners of the network, and the output is taken from the remaining two corners. Let us assume that the transformer is working properly and there is a positive potential, at point A and a negative potential at point B. the positive potential at point A will forward bias D3 and reverse bias D4. The negative potential at point B will forward bias D1 and reverse D2. At this time D3 and D1 are forward biased and will allow current flow to pass through them; D4 and D2 are reverse biased and will block current flow.The path for current flow is from point B through D1, up through RL, through D3, through the secondary of the transformer back to point B. this path is indicated by the solid arrows. Waveforms (1) and (2) can be observed across D1 and D3.One-half cycle later the polarity across the secondary of the transformer reverse, forward biasing D2 and D4 and reverse biasing D1 and D3.Current flow will now be from point A through D4, up through RL, through D2, through the secondary of T1, and back to point A. This path is indicated by the broken arrows. Waveforms (3) and (4) can be observed across D2 and D4. The current flow through RL is always in the same direction. In flowing through RL this current develops a voltage corresponding to that shown waveform (5). Since current flows through the load (RL) during both half cycles of the applied voltage, this bridge rectifier is a full-wave rectifier. One advantage of a bridge rectifier over a conventional full-wave rectifier is that with a given transformer the bridge rectifier produces a voltage output that is nearly twice that of the

conventional full-wave circuit.Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for reference source, comparator amplifier, control device, and overload protection all in a single IC. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustably set voltage. The regulators can be selected for operation with load currents from hundreds of milli amperes to tens of amperes, corresponding to power ratings from milli watts to tens of watts.

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5. Conclusion

In this paper, we presented a cheap and efficient wristwatch that can rein in the problem of women security and kidnappings. It saves lot of human life. Women will be protected by surrounding people when human actions to be performed. There is an lot of evidences about criminal information will be passed to controller room. Women can be safely protected. The watch gives promising results for localizing a user in urban clusters. The efficient method that can rein in the problem of women security and kidnappings. The device gives promising results for localizing a user in urban clusters In future we plan to further reduce the size of our device by using Quectel M66 open CPU

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