Health Monitor with Syncope Detection System

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Abstract - *We have got a string of highly advanced pulse detector, fall detector, temperature, and pressure and vibration sensors in the market but are mostly conventional. So in this project what we have innovative is to merge eye blink detectors (and some more detectors) with Health Monitor so as to develop an advanced or rather complete Syncope Detection System. When someone faints, then his/her heartbeat becomes slower or faster than normal and will fall. But still we cannot confirm that the person fainted. So now to make it confirm that it is Syncope we will monitor the victim's eyelids. Here we have two conditions during Syncope; either the person eye will get closed for very long span of time it may be opened for very long time span. Using the conventional with this new technique we can detect Syncope with confirmation.*

Key Words: Syncope, Eyelid, Health Monitor, Sensors, Detectors.

1. INTRODUCTION

In our day to day life we come across several accidents, trauma, crimes, and other life threatening cases due to Syncope. Annual number of episodes is 18.1 to 39.7 per 1000 patients, frequency between 15% to 39% excluding crime cases.

Now in order to counter these drastic conditions such a kind of project will be a boon. It not only detects Syncope but can also predict whether it's a prank or no, so that both people from medical field (Doctors, Ambulance services, etc) as well as Forces/Corps (Police, Volunteers, etc) could do their respective services smoothly without unnecessary harassment and wastage of time and resources.

*Syncope: a temporary loss of consciousness usually related to insufficient blood flow to the Brain. It is also called Fainting or Black out.

 Health monitor will detect the Heartbeat using Pulse sensor and will show the reading in BPM (Beats per Minute) on the LCD connected to it. It will also send the readings to a server (For. E.g. Thingspeak) so that the Heartbeat could be monitored from anywhere on the globe over Internet.

2. PROPOSED SYSTEM

This project is basically the combination of Heartbeat Detectors and various sensors like Eye blink detectors, Temperature sensors, Vibration sensors, Pressure sensors, Fall detectors, etc. Conventionally the Heartbeat detectors are used to detect the Heartbeats usually in BPM (Beats per Minute). The Heartbeat of a person could be monitored from anywhere on the globe due to GSM (Global System for Mobile) facility. The sensors are used for their specific purpose. Eye blink detectors are used to detect blinking of eyelids, it can also be used as Driver Drowsiness System.

The Eye blink detector and Heartbeat detector plays the most vital role in detecting Syncope. The Eye blink detector checks whether the Eye is closed/opened for very long span of time. The Heartbeat detector detects the Pulse rate and checks whether it is abnormal or not (i.e. very high or very low). If both the condition is satisfied then it will ask for a confirmation from the victim whether he/she is ok or not. If it gets no response from the victim up to a specific span of time then it will automatically send an emergency message to the nearest medical centre or Ambulance for help. The medical centre or Ambulance can then find the exact location of the person via GPS tracking system and reach to the person.
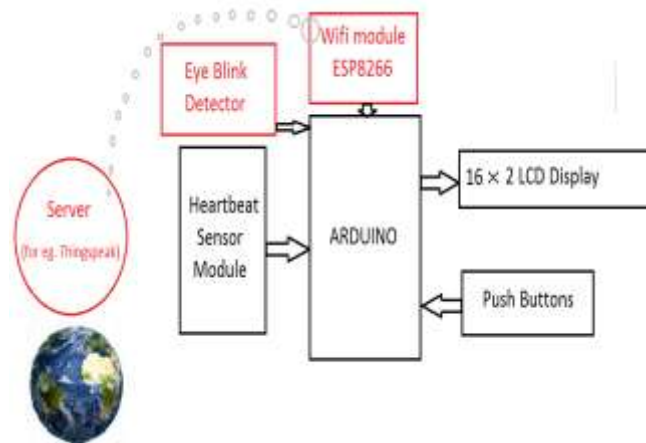
Fig.-1: Block diagram of Syncope Detection System

Fig. 1. Represents how Syncope Detection System of the project will work. This part of the project is all about the detecting of pulse of the victim and sending those readings to a server like Thingspeak, making those readings accessible from anywhere on the globe. The next part of project deals with Syncope Detection System which is the most innovative part of the project.

The Syncope Detection System is basically the combination of Eye blink detectors, Pulse sensors and some other sensors. There exist a controversy on where and how the Blinking of eye be detected, so the best conclusion is to fix the Eye blink detectors on the frames of Spectacles, Goggles or Sunglasses, what so ever it is.

The IR (Infra Red) sensors fitted on the frames will act as Eye blink detectors and will successfully check whether the eye of the victim is opened or closed for too long span of time or not. The below fig. 2 gives the pictorial representation of Syncope Detection System.

Fig -2: Pictorial representation of Syncope Detection

Fig. 2. Shows pictorially how an efficient or rather a complete Syncope Detection System will work. It consists of two images, first one is Eye blink detector and second one is the Pulse detector. The Eye blink detector is basically an Infra Red (IR) detector which is placed on the frames of spectacles and detects the blinking of Eyelids. The other one is Pulse detector which is placed on the belt of wrist watches and it detects the pulse of the victim. The combination of both Eye blink detectors and Pulse detectors we can give rise to an Efficient Syncope Detection System. Till now whatsoever discussed was about Syncope Detection System. Now let us take an overview on the how the Health monitor works and how it give assistance or support to Syncope Detection System because this broadly covers two major domains one is Health monitor the other one is Syncope Detection System. Here in this project we will be monitoring the victim's health along with assisting him/her during Emergency. So now in

order to monitor a person's Health we will be using several sensors and detectors some of which includes Pressure sensors, Temperature sensors, Vibration sensor, etc. The Pressure sensors will check whether the blood pressure of the person is within the normal limits or not. Similarly, the Temperature sensors will check whether the body temperature of the person is within the normal range or not. And the Vibration sensors will check whether any abnormal vibration rate is occurring or not.
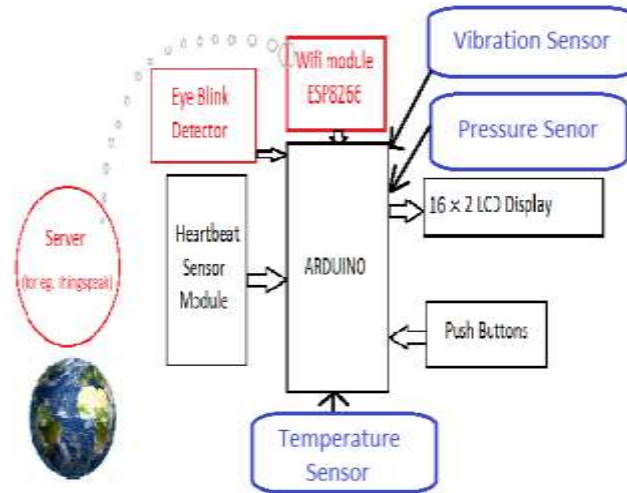
Fig.-3: Block diagram of Health Monitor with Syncope Detection System

Fig. 3. Represents how Health Monitor with Syncope Detection System will work. Fig. 3. is similar to Fig. 1. and the only difference is the addition of few more sensors (i.e. Temperature sensor, Pressure sensor, Vibration sensor).

The addition of these sensors helps in monitoring the victims overall health conditions and in addition to it they also help in analyzing whether any prank is done by the victim or not. Before sending an emergency message to the nearest Ambulance service or medical service or cops or any other emergency service, it will analyze all the output as medical report and then if all the conditions gets satisfied then only it will automatically send the emergency message else not.

Now if the victim manually seeks help then also it will send emergency message but in that case he/she is solely responsible for calling and answerable to the concern authority. One other case is possible that is, initially the health of the victim was deteriorating and later on gets cured quickly, so then for such cases a provision is provided to cancel to the emergency call but from the system side no issue would be raised.

3. CONCLUSION

This project can be a boon to medical industry and mankind. It can efficiently detect Syncope and can be used as a life saving gadget during emergency. It can prevent a person from getting drugged, raped, and kidnapped and many other crimes. It can efficiently avoid prank done by victims itself. Now coming down to its usage, it can be used by physically challenged or differently abled people, infants, elderly as well as common people. It has only two minor drawbacks, firstly, it is a bit tough to maintain as it is having delicate components and secondly, the cost is a bit high. Finally the question arises why to focus on such a project, in answer to which some data statistics are presented below which will hopefully describe the need for such a project. The following fig. 4 is a graph which represents offences vs. percentage assused. Here we can see that huge percentage of crime is based on sexual offences, drug offences, kidnapping and related offences, such crimes constitutes minimum 10% of all the offences which means focusing on such project can actually eradicate minimum 10% of the entire offence.
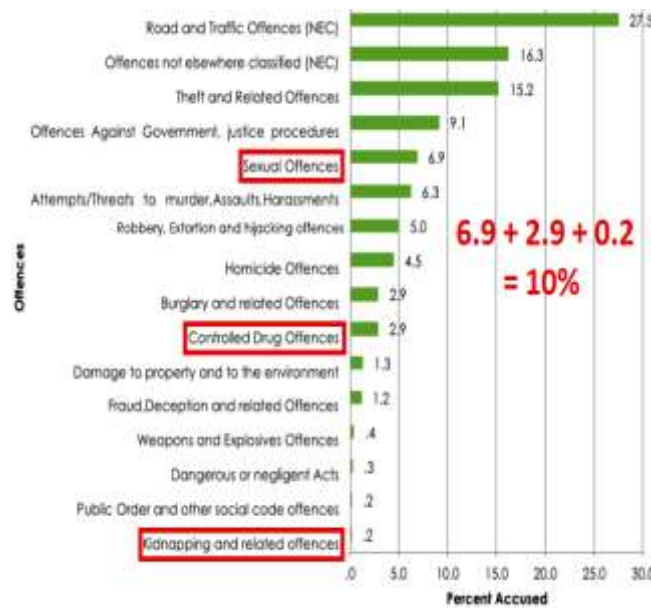
Fig.-4: Graph representing Offences vs. Percent Accused

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BIOGRAPHIES

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