

# Wireless Monitoring of Driver's Pulse Rate and Temperature Using Glove Approach

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**Abstract-** In today's era, there is growing concern about the dangers related to the driving, for people with known cardiovascular diseases. However, the association between having a cardiovascular disease and being involved in a vehicle crash remains a serious concern. This study aims to monitor people with known medical disease or other medical conditions while driving.

It also helps the co-passengers to be alert, while the person is driving with an abnormal health condition. Designed it to be convenient and also can be easily adaptable by the end user. The proposed project focuses on a wearable sensor glove that equipped with a pulse rate sensor Temperature sensor, conductive thread, and an embedded system consisting of a power supply, Atmega microcontroller and Radio frequency transmitter unit. This project consists of three systems: Transmitter, Receiver, and Wireless healthcare monitoring unit. The transmitter section includes sensors, processing unit and Radio frequency for transmission Here the pulse sensor uses a technique called Photoplethysmography (PPG) and temperature sensor used here is LM35. The pulse sensor is mounted on the index finger of the gloves which takes the raw data from the human body and then sends to the microcontroller receiver using conductive thread. The conductive thread sewed into the gloves feed the signal into the atmega. Data is analyzed in atmega and then sent to the receiver.

The receiver end consists of a Atmega, interfaced with display, storage, GPS, and GSM. Data from transmitter side is acquired using RF receiver and sent to the Atmega in receiver side, which is programmed such a way that the pulse rate and temperature parameters are measured.. When pulse rate and temperature are below or above the threshold value, an message will be sent to alert the co-passengers

## I. INTRODUCTION

There are numerous cases of accidents because of health issues of driver, to solve this issue of concern related to the vehicle accidents we proposed a system

in which the sensor is positioned under the index finger of the hand, and the transmitter module is fixed on top of the glove. The Sensor which is used here is an pulse sensor, which uses a technique called Photoplethysmography and non-invasive heart rate monitoring. This system has an advantage over the other devices, where it is capable of sending the health parameters with GPS coordinates to the wireless healthcare-monitoring unit using GSM technology. Also, the co-passenger is alerted in a case of any abnormality or incident.

## II. SCOPE

One way to eliminate motion artifact can be eliminated using placing the sensor in such a way that it cannot be effected by motion artifact and flexible hand module can result in more efficient and accurate device. The motion artifact can be eliminated in future work by employing adaptive filter techniques

## III. STATISTICS

Cardiovascular diseases are one of the leading causes of death in the United States. According to 2008 Statistics, the overall rate of death attributable to cardiovascular diseases (CVD) was 244 per 1000000. The rates were 287.2 per 1000000 for white males, 390.4 per 1000000 for black males, 200.5 per 1000000 for white females, and 277.4 per 1000000 for black women. 4 In 2008, CVD was responsible for 32.8% death, i.e., 811940 of all 2471984 deaths', or 1 in every three death in the USA. By 2008, mortality rate data, more the 2200 Americans die each day of CVD, on an average one death for every 39 seconds.

## IV. DESIGN AND PROPOSED MODULE

The hand module, which is mounted on the gloves, consists of a pulse sensor, temperature sensor, an amplifier unit, atmega microcontroller unit, and RF transmitter and receiver. Sensors detect the signals and sends it to the amplifier. The amplifier module amplifies the signal and filters it, before fetching the signal into the microcontroller. The conductive thread is used to carry the signal from the sensor to the microcontroller. This thread sewed into the glove fabric. The microcontroller converts analog data to digital data using ADC converter. The microcontroller programmed in such a way that it calculates the pulse rate and transmit using radio frequency transmitter. Receiver end consists of a microcontroller, which interfaced with radio frequency receiver, display, and GSM & GPS module. The radio frequency at the receiver end receives the data from the transmitter and the sends to the microcontroller. The microcontroller is programmed to interface with the display, buzzer. The pulse rate and the temperature will be monitored in the real time. When the pulse rate and temperature are above or below a certain threshold value i.e. great, the co-passengers are warned regarding the potential danger. The GSM module, which placed in the car, can be used for sending the text messages to the healthcare-monitoring unit or to the emergency contact number The doctor can know the status of the driver by sending a message to the GSM module that equipped with SIM card. Later the details of the drivers health are sent using GSM service.

## V. RESULT

The experiments and test performed were used in initial system analysis threshold determination and system validation. Initially, the subject wears the glove equipped with sensors. Then the data from the hand module is sent to the computer using serial communication cable for testing the accuracy of the waveform. Test 1: In first test, the subject is asked to wear the gloves on the hand and keep the hand at rest. Test 2: In the second test, the subject is asked to drive a car and hold the car steering. Test 3: In third test, the subject is asked to bend his wrist while holding the car steering.

## VI. CONCLUSION

“Wireless health care monitoring for drivers pulse rate and temperature using hand gloves approach” device can be used in ideal condition. From the test conducted above, it can be concluded that pulse rate depends upon the movement of hand in some activities while driving. But due to the regular movement of hand, it is affected by 'motion artifact'. Due to motion artifact, the pulse rate is then corrupted and this leads to inaccurate pulse rate. This device can be used in to some extent of movement of hands, but it will be affected by motion artifact in regular movement.

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