# Soldier's Paramedical System

**Rathod Lalit R[1] Badgurjar Anil I[2] Panchal Aniket R[3] Mr. Hardik Trivedi[4]**
[1,2,3]Student [4]Assistant Professor
[1,2,3,4]Department of Electronics & Communication Engineering
[1,2,3,4]SAL College of Engineering, India

*Abstract*— In Today's World Enemy Warfare is an important factor in any nation security Mainly Depends on defense department. In that time Important & vital role is played by the soldiers. so, we find many concern regarding the safety of these soldiers. In our project we have come up with an idea of give the soldier's health status data Temperature, Hard bits, ECG. Send to medical section. Then base station can understand the Health status data. If any soldiers have critical data or need the help. Then provide the immediately help by a medical department. The vital signs include Pulse rate, Blood pressure, Body temperature, ECG.

***Key words:*** Body Sensors, Advance Ardiuno (Uno R3), IOT Through Data Transmit

## I. INTRODUCTION

Project is to make a Solder's Paramedical System and in this system is use a sensors like temperature sensor, ECG, blood pressure sensor. ECG are used to sense our body part and given our health information. This system is used in a solder's and which is work in field area and lower temperature areas like ciyachin etc. their solder's health information is transmit to medical team which is immediately given a service to a solder's. Our data is transmitting in IOT based.

## II. PURPOSE OF FLOW CHART

When a system is start that time a sensor are sense a body parts like a pulse sensor is sense a our pulses of body and temperature sensor is sense a body temperature and ECG is also connect a body parts. These sensors are interfacing with ardiuno controller and this data is given to a zigbee device. At a transmitter side transmit data and receiver side receive data. And this data is collect by medical department.

A Wireless Communication and Global Location Enabled Intelligent Health Monitoring System comprising of a plurality of Wireless Medical Sensor Apparatus for measuring patient's vital signs on different parts of a patient's body, and a Main Processing Unit Apparatus containing System Software that uses an active, real-time monitoring method to way wireless communication task [1].

ZigBee networks based on different mobility models. The networks has been studied intensively and obtained the results by using various performance metrics. This zigbee is use as a transmitter and receiver, it will transmit data from Ardiuno. And at the receiver side receive the signal by Zigbee receiver. This Zigbee is connected with computer. Computer having a lab view software which is incicate various parts of body signal.(e.g. Temperature of body, heart beat are shown in lab view).

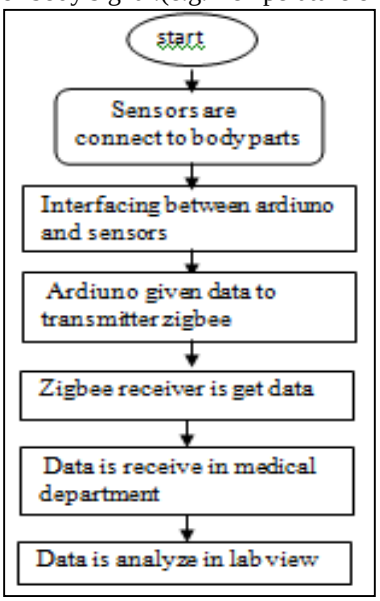


Fig. 1: Flow chart-working process

### *A. Block Diagram*

In our project, we have a transmits soldier's health data to a medical department and this data is transmitting in a IOT based. So we have use a Zigbee through transmit our data. In a project we use a different sensors like a pulse sensor, temperature sensor and ECG sensor. Using this sensors collect health of solders data and this is transmitting through a Zigbee. In a soldiers side a transmitter and medical department having receiver. Receiver side this data is continually checks data in monitoring lab.

When any variation is occur in any soldier that time immediately medical team is reach this place and given to a proper medical check-up.


Fig. 2: Ardiuno Interface

In this we use Ardiuno which is interfacing with a sensors and given to required power. And we use a Uno R3- Ardiuno which is a advance Ardiuno and this is also use to more sensors are easily interfacing. Pulse sensor is getting a pulses of a solder and temperature sensor is used to get a temperature of body and last one is a ECG which is given to proper hart beat sense and this data is transmit through a zigbee.

In a medical department soldier's health data is receive and analyze this data in a monitoring department. And this data is monitor by a lab view.

*B. Pulse Sensor*

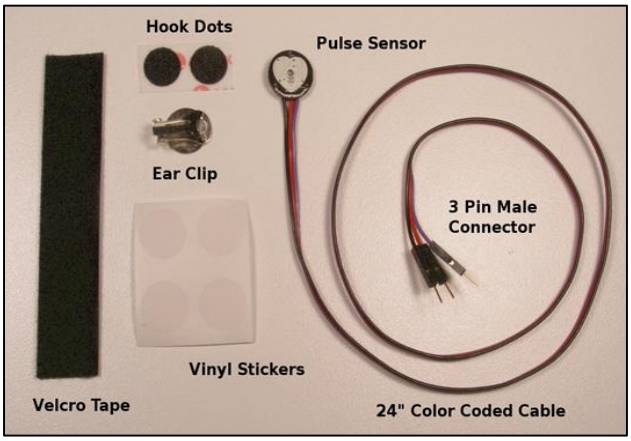


Fig. 2: Pulse Sensor

Pulse Sensor is a well-designed plug-and-play heart-rate sensor for Arduino. The sensor clips onto a fingertip or earlobe and plugs right into Arduino with some Jumper cables. The front of the sensor is the pretty side with the Heart logo. This is the side that makes contact with the skin. On the front you see a small round hole, which is where the LED shines through from the back, and there is also a little square just under the LED. The square is an ambient light sensor, exactly like the one used in cell phones, tablets, and laptops, to adjust the screen brightness in different light conditions. The LED shines light into the fingertip or earlobe, or other capillary tissue, and sensor reads the light that bounces back. The back of the sensor is where the rest of the parts are mounted. We put them there so they would not get in the way of the of the sensor on the front. Even the LED we are using is a reverse mount LED. For more about the circuit functionality, check out the Hardware page. [needs link] The cable is a 24" flat colour coded ribbon cable with 3 male header connectors.

- RED wire = +3V to +5V
- BLACK wire = GND
- PURPLE wire = Signal

*C. Temperature sensor (DS18b20Z)*

The DS18B20 digital thermometer provides 9-bit to 12-bit. And temperature measurements and has an alarm function with nonvolatile user-programmable upper and lower trigger points. This sensor is communicates over a 1-Wire bus that by definition requires only one data line (ground) for communication with a central microprocessor. In this sensor can derive power directly from the data line (parasite power), eliminating the need for an external power supply. Its having a unique 64-bit serial code, which allows multiple function on the same wire bus. Then it is supplely to use one microprocessor to control many temperature sensors distributed over a large area. Applications that can benefit from this feature include environmental controls, temperature monitoring systems inside buildings, equipment, or machinery, and process monitoring and control systems.

Fig. 3: Temperature Sensor

*D. Ardiuno Uno R3*

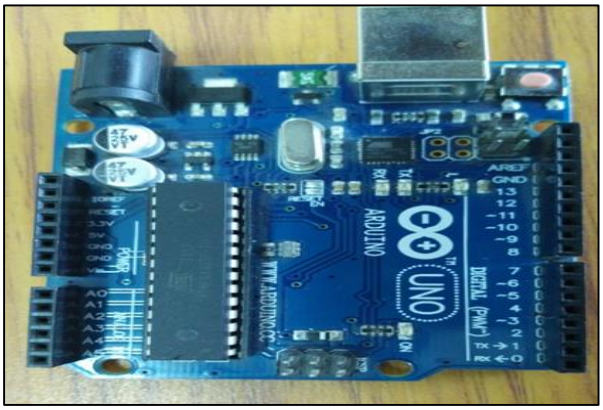


Fig. 4: Ardiuno unor3

Arduino is the world's leading open-source software and hardware. A range of software tools and hardware are uses developers and non-developers, have the ability to build smart, connected and interactive 'things' using affordable and feature-rich technologies.

Arduino is a popular platform for IOT product development and is commonly used for projects. Arduino is use to interfacing between sensors and also connect a power supply.

*E. Interfacing between Components*

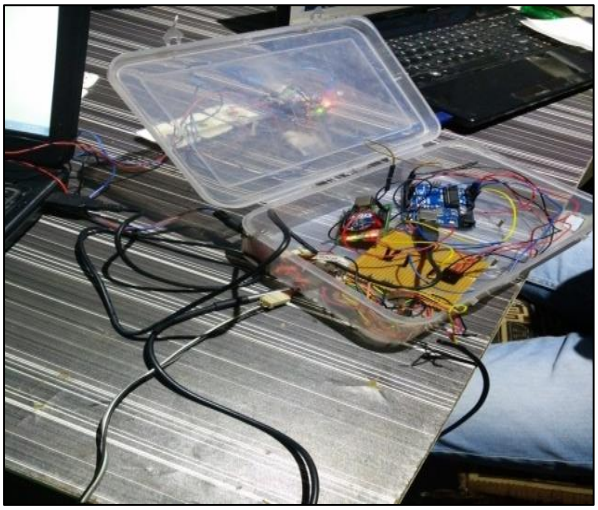

Fig. 5: Project connection

Our components are implement in circuit board and sensors are connected with an Arduino (Uno r3) and our circuit and other components are in a box. The use of wireless technologies in medical environments is bringing major advantages to the existing healthcare services. However, these have several key research challenges such as various types of network communication infrastructure, fault-tolerance, data integrity, low-power consumption, transmission delay, node failure, etc. Reliability is one of the most important factors in a successful healthcare system [4].

*F. Checking of Components*

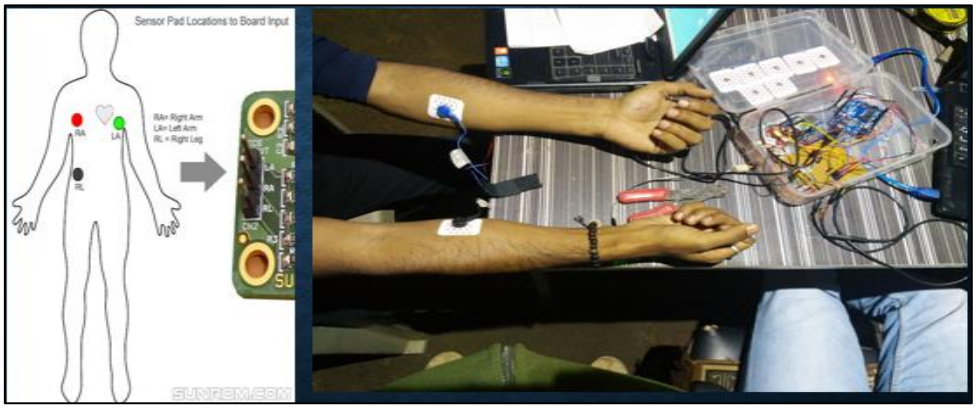


Fig. 6: Connection of project

In above fig.7 is shown a ECG sensors are we connect in chest/arm. We use a ECG's electrode connect in arm and their output is indicated in monitoring PC. The main tasks of the medical sensors are to collect physiological signals and send them to the personal server. Typical medical sensors and characteristics of the signals are shown [5].

## III. PROGRAMMING'S OF SENSORS

*A. Temperature Sensor Program*

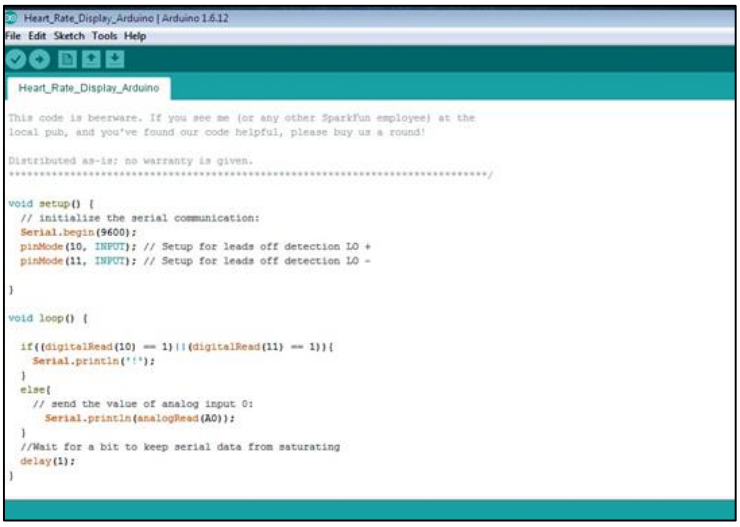


Fig. 7: Program simulation

*B. E.C.G. Sensor Program*

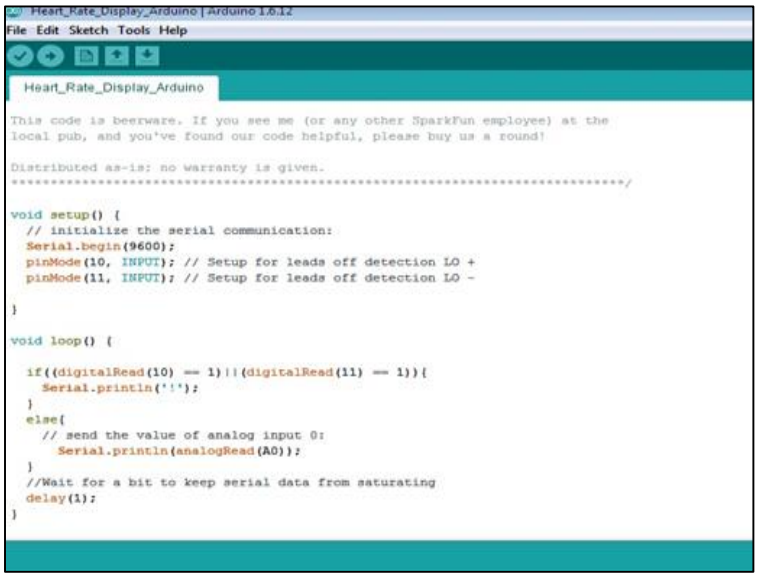


Fig. 8: Program Simulation

*C. Lab View*

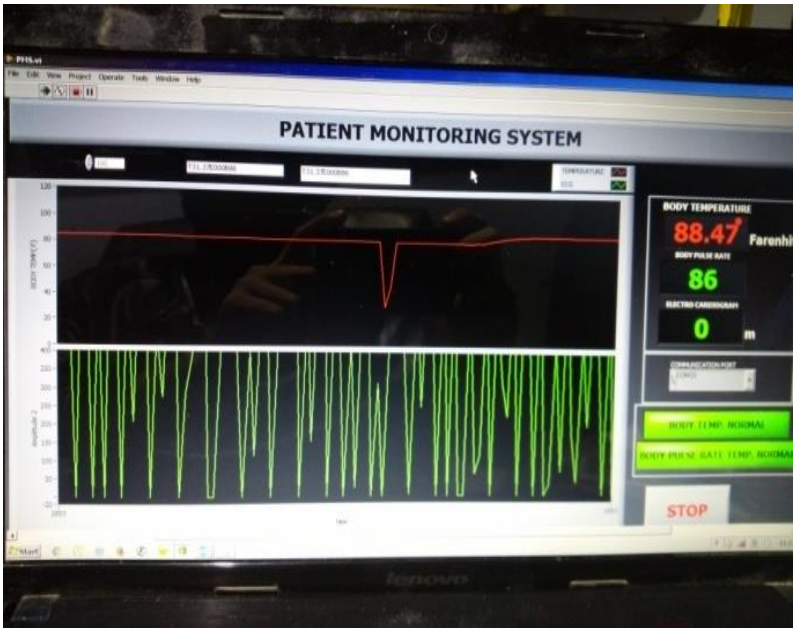


Fig. 9: LabVIEW

A wireless communication system is designed and developed for remote patient monitoring. The primary Function of this system is to monitor the temperature of a patient's body, and display the same to the doctor through RF communication [6]. When a data is received by a zigbee receiver and this is connecting with a computer and their data is analyzing in monitoring lab. Above fig shown a temperature of body is indicate in ferrite and ECG's output also indicate in it.

## REFERENCE

[1] Thomas C. H. Chen, Creek Dr., Houston, Connien J. Chen, Houston "Wireless Communication and Global Location Enabled Intelligent Health Monitoring System"
[2] Elmustafa S. Ali Ahmed1, Bakhita El.Sheikh Ali2, Eman Omer Osman3 and Tagwa Amin M. Ahmed4 "ZigBee MAC Protocols Based on Different Mobility Models"
[3] Rajasekaran.S1, Kumaran.P2, Premnath.G3, Karthik.M4 "Human Health Monitoring Using Wireless Sensor Network"
[4] Mehmet R. Yuce & Steven W. P. Ng & Naung L. Myo & 11 of 12 Jamil Y. Khan & Wentai Liu; "Wireless Body Sensor Network Using Medical Implant Band", Springer Science + Business Media, 25 July 2007
[5] Victor Shnayder, Bor-rong Chen, Konrad Lorincz, Thaddeus R. F. Fulford-Jones, and Matt Welsh.; "Sensor Networks for Medical Care", Harvard University Technical Report TR-08-05, April 2005
[6] Celebi, M. 2002. Seismic Instrumentation of Buildings (with Emphasis on Federal Buildings), Menlo Park, , CA, USA: US Geological Survey (USGS). Report No. 0-7460-68170