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Wireless Sensor Based Health Monitoring System for Co-Morbid Patient

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ABSTRACT

Patients are suffering from physical and mental activities called co-morbidities. We have to give treatments for co-morbid patients while in home or in hospital. The patient should be monitored by caregivers. Caregivers can't predict the accurate timing and the exact change of the optimal result of the patient. In this case, we have to use sensor to monitor the patient activities without manual support. By using eye blink sensor, motion sensor and temperature sensor to check the level of patient and it will be displayed in LCD. If some abnormalities occur, we have to give alarm by using buzzer to caregiver, doctor or family members. We have to use ZigBee, for storing the patient details in the hospital management. It is useful to check the patient report with secure level in the database.

***Keywords*:** Sensors, ZigBee, LCD, Buzzer

1. INTRODUCTION

Patients are suffering from different kinds of disease. Due to high cost they are often treated at home especially co-morbid patients. Our approach is to allow us to monitor the patient continously through the sensors without the manual support (care takers). In this system, Information and Communication Technologies play a vital role to increase the safety and efficiency to enable the patient monitoring. While monitoring, the data can be updated on the

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PC and will send the data to the monitoring section. The collection of different data about the patients details are stored in secure way. Modern communication system gave a major support to the medical field.

2. LITERATURE SURVEY

This paper has been proposed [1] about the home based health monitoring system using android Smartphone. The main aim is monitoring the patient in easier way. By using biosensor to continuously take the temperature, Pulse Rate and ECG of the patient. It also gives feedback to doctor and patient through their mobile device using android application. The data can also be displayed on personal data and to reduce the health care cost.

This paper has been proposed [2] about the method of performance monitoring and control by wireless body sensor network. We have to monitor the patient with the help of this sensor and transmitting the health care related data whether the information is correct or not. We have used a performance meter to measure the performance and to check the similarities with real time measurement data.

This paper has been proposed [3] on coma patients who are not treated at home. There are many illnesses so the health care process is reduced. A supervision action can be carried out within hospital, but missing at home. To monitoring the patient such that blood pressure, pulse rate, temperature, blood glucose, oxygen saturation, electrocardiogram by using mobile bio sensor and store the result in PHR. Best practice is not in home treatment. Most practice guideline is intended for clinical treatments are not easily mapped to home treatment.

This paper has been proposed [4] with the mhealth wireless mobile technologies used to improve the chronic patient healthcare. Mhealth is also called mobile health technology. The mobile health technologies are making the patient health more affordable, accessible and available. Nowadays the key stakeholders have launched several health applications, that are proliferating and targeted wide range of services.

One of the service is GSMA tracker. The GSMA will always track about the patient condition and intimate to the doctor. The aim of our paper is to period guidance for mobile based health solution and to help the technicians to promote the services by implementing the insights.

3. ARCHITECTURE OF THE PROPOSED SYSTEM

In this system, we are going to monitor the Como patient using pic microcontroller which is shown in Fig. 1. The eye blink and motion sensor are used to monitor the eye blink and movement of the Como patient and intimate to monitor section using Zigbee.

The data are displayed in the LCD and if any abnormal occurs then alert signal is given by the Alarm. Another Zigbee in the server section is interfaced with a PC. The data received is decrypted and the database is updated in hospital home page. Here the password production is applied for secure database management. So the authorized persons only can access the database for particular patient's reference.

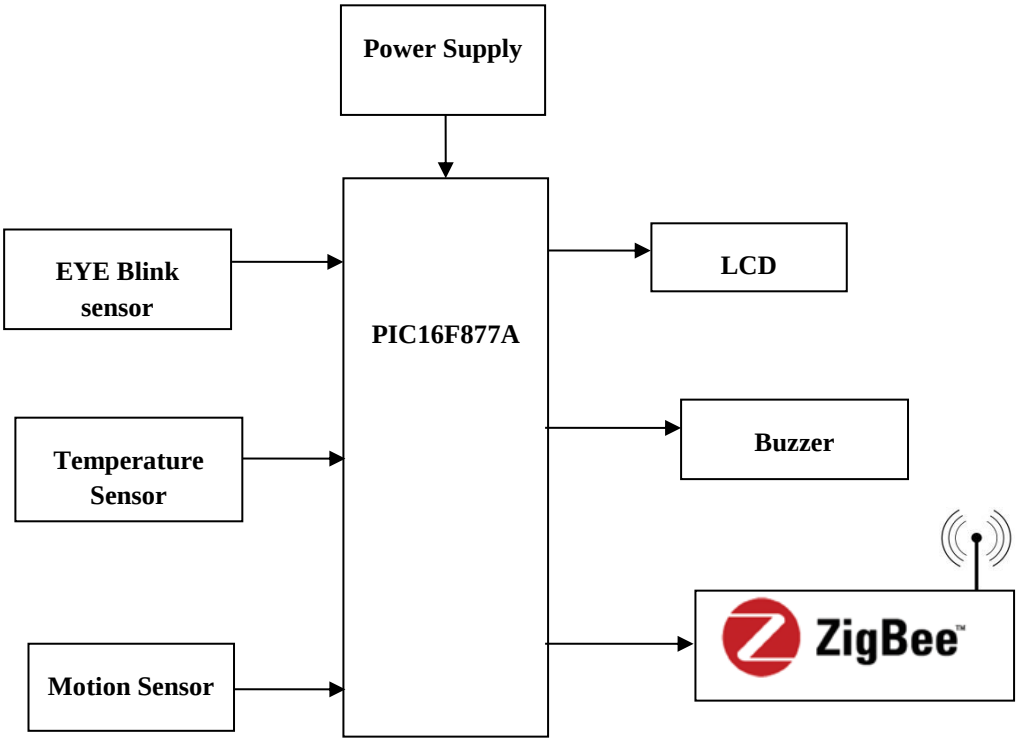

Fig. 1. Architecture of Microcontroller.

3. 1. Types of Sensor

Types of sensors used are motion sensor, temperature sensor, eye blink sensor.

3. 1. 1. Motion Sensor

A **motion detector** is a device that detects moving objects, particularly people. A motion detector is often integrated as a component of a system that automatically performs a task or alerts a user of motion in an area. Motion detectors form a vital component of security, automated lighting control, home control, energy efficiency, and other useful systems.

3. 1. 2. Temperature Sensor

Temperature is the most often-measured environmental quantity. Temperature is one of the most commonly measured variables and it is therefore not surprising that there are many ways of sensing it. Temperature sensing can be done either through direct contact with the heating source, or remotely, without direct contact with the source using radiated energy instead.

3. 1. 3. Eye Blink Sensor

Sensing element detects the optical muscles movement continuously and amplified to give pulse output the elastic strap holds the sensing element in place of vision muscle movement. The active element is formed by two metallic electrodes A and B; they are placed

in a feedback loop of high frequency oscillator. When no target in present the sensor capacitances are low therefore the oscillator amplitude is small. When we target a face of the sensor it increases the capacitances. This increase in capacitance results in an increased amplitude of oscillator.

3. 2. Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, Electromechanical, or piezoelectric. Typical uses of buzzer and beepers include alarm devices, Timers and confirmation of user input such as a mouse click or keystroke. A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click, a ring or a beep.

3. 3. LCD (liquid crystal display)

A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly. LCD is used to display the results of the system operation such as sensed values, motor status etc.

3. 4. ZIGBEE

ZigBee is a specification for a suite of high-level communication protocols. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Its low power consumption limits transmission distances to 10–100 meters line-of-sight, depending on power output and environmental character.

4. CONCLUSION

The proposed system in the paper is designed for co-morbid patients using three types of sensors if any changes occur in the body it can monitor, without manual support, while monitoring the values will be displayed in LCD if changes the alert signal is given by the alarm. The values are stored in ZigBee and transmitted to the PC.

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