

HEALTH MONITORING WIRELESS SENSOR DEVICES

Pooja Jain¹, Rashid Hussein², Sandhya Sharma³

^{1,2,3} Department of Electronics and communication, Suresh Gyan Vihar University, Jaipur Rajasthan

¹Jain.pooja235@gmail.com , ²hussain1992@gmail.com , ³sandhyasharma.mbm@gmail.com

Abstract---This paper presents a survey on health monitoring with the investigate number of devices in WSNs .This paper discusses devices which is used in health monitoring. Wireless sensor network consists sensors which are low power and low cost that integrates limited computation, sensing and the radio communication.

Keywords---health monitoring, wireless sensor network, medical information system, e-healthcare.

INTRODUCTION

Wireless sensor network (WSN) by the features of low power consuming and low cost gained much more attention from researchers, because the application of WSN in varied area such as pollution monitoring, habitat monitoring, health monitoring, military target tracking etc. WSN is also improving reliability of the link which is creating between sensor and monitor. Each sensor of WSN consists three subsystems: (A)sensor subsystem: sense the environment which we monitoring(B)processing subsystem: perform local computation on the sense data (C) communication subsystem: exchange the message with neighbour sensor. Application of wireless sensor network in body area of health monitoring is called WBAN(WIRELESS BODY AREA NETWORK) or WBSN(WIRELESS BODY SENSOR NETWORK). WBAN is very useful for early detection the parameter of emergency condition of patients and it can be continuously monitor the health condition of patients. health monitoring required sensor according to the health parameter. Wireless body sensors arranged in

patient's body and they can be used to monitor any condition of patients. These sensors monitor the patient's body signs

(e.g temperature, heart rate, blood pressure, oxygen saturation, etc.) and transmit the sense data at some remote location without human intervention. And then doctor can interpret these sensor readings to access the patient's condition. An intelligent monitoring system should be supported by sensor which fulfils with these characteristics as: (1) Accuracy- sensor should have reliable accuracy (2) Benefit- sensor should be reasonable (3) Size- sensor size should be small (4) Durability- sensor should be durable and long lived (5) Ease in operation-sensor should be easy to operate and time consumed for measurement.

A number of innovative wearable technologies have emerged in recent years that aim to revolutionize the healthcare industry. Wearable technology will:

1. Educate and empower patients to take control of their health.

Wearable technology puts a patient's real-time personal health data in his own hands. Ten or 15 years ago, patients relied solely on a doctor's professional opinion for feedback on treatment and health progress. Now, patients can monitor their own health from home or on the go. They can educate themselves and make decisions on issues that affect their bodies. within a patient's body. This improves patient adherence to treatment by putting the data right at their fingertips. For example, Ingestion Event Markers (IEMs) are consumed with medication to gather and transmit information from



Fig 1: Patient monitor own health at home

2. Help physicians and patients monitor and diagnose disease.

Some wearable technology sends data about organ function and disease markers right to physicians. This gives them access to in-depth information when monitoring a chronic disease or making a diagnosis. Diabetes patients benefit from a number of new technologies that monitor blood glucose levels, deliver insulin, track food intake and activity levels, and transmit data straight to their doctors. embedded directly in a diseased organ. The chip sends biometric readings back to the patient or healthcare professional via Wi-Fi, which allows them to monitor and



Fig 2: Monitor the patient body with the help of Wi-Fi

3. Assist in medical procedures.

The possibilities for wearable medical technology seem infinite. Surgeons wearing Google Glass can give other physicians and medical students the perfect point of view during surgical and medical procedures, and Glass has already been implemented in training. In fall 2013, a surgical team at the University of Alabama at Birmingham used VIPAAR (virtual interactive presence in augmented reality) technology in conjunction with Google Glass during surgery. By merging these technologies, surgeons could interact and see both sets of hands in the surgical field. This type of “telemedicine” enhances patient care by granting veteran surgeons opportunities to provide

valuable expertise remotely to less-experienced surgeons.

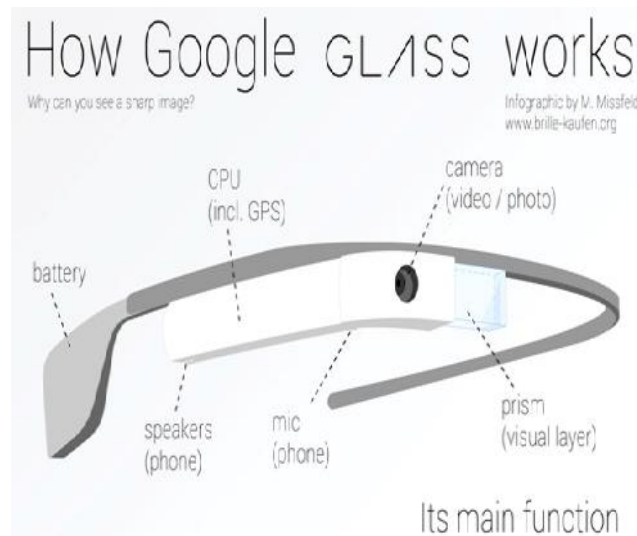


Fig 3 :How Google glass works

4. Allow patients to control and manage their pain.

The technology industry is currently developing portable pain relief devices that eliminate the need for daily pain medication for the estimated 1.5 billion chronic pain sufferers around the world. The Transcutaneous Electrical Nerve Stimulation (TENS) patch is being designed to deliver low-voltage electrical stimulation to alleviate pain in chronic sufferers. The patch includes Bluetooth connectivity that connects to a Smartphone app so patients and physicians can track and manage the pain.



Fig 4: TENS device



FIG 5: Working of TENS pain relief device

CASE STUDIES

CASE 1: Accident Patient Remote Monitoring

The goal of this system is monitoring the accident patient before hospitalization. For this monitoring we use AID-N (Advanced Health and Disaster Aid Network) device. The goal of this device is collect, track and report health of patient using GPS system. The AID-N electronic system provides similar functionality as other electronic device. According this device the date transfer to the doctor via internet, so doctor get the condition of the patient by the reports then he give the better treatment to the patient before hospitalization. This system is designed to required little setup time. This electronic system use 2.4 GHz radius and speed is 250 kbps.

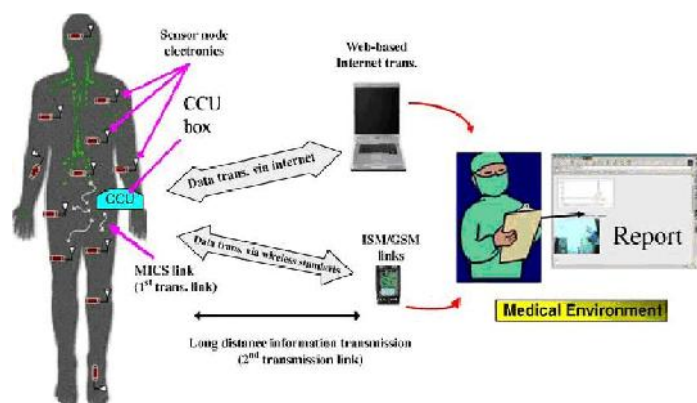


Fig 6: Doctor get the report of the patient

CASE 2: Old Age Persons Remote Monitoring

The goal of this monitoring system is safety of old persons from various hazards like fire, accident, electric shock etc. The device used for this monitoring is wireless sensor wrist watch which is basically used for monitoring the pulse rate of the person wearing it. The wrist watch has an inbuilt microcontroller, zigbee

module , skin temperature sensor and pulse rate sensor . This device then wirelessly sends message to the controller lcd about pulse rate and temperature of the person according to the surrounding environment. Thus we can accordingly control the health of old person wherever he goes wirelessly

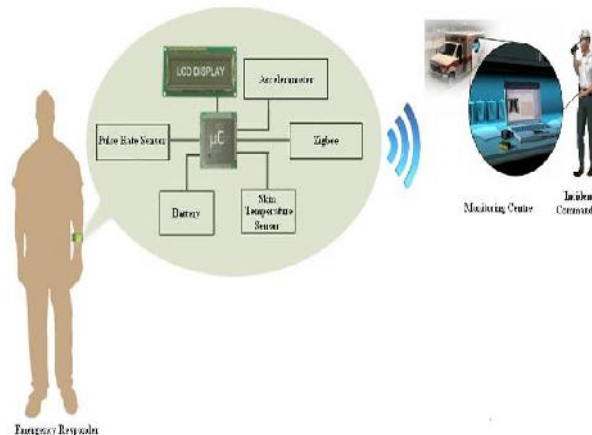


Fig 7: Wireless health monitoring system of old person

Conclusion

This paper presents implementation of wireless sensor network for real time health monitoring by using various wireless devices like Google glass, Transcutaneous Electrical Nerve Stimulation, Advanced Health and Disaster Aid Network etc. Wireless sensor technologies offer ability to connect patients with the doctor for health monitoring in different cases .This technology helping for low power consuming, low time consuming , high efficiency , virtual connectivity with doctors and high reliability.

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