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Doctors Assistive System Using Augmented Reality for Critical Analysis

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ABSTRACT: Doctors are regularly on the lookout for technologies that will enhance their operating environment.They are often the early adopters of technologies that allow their field to offer a better patient experience. The continuing enhancement of the environment in the digital age has led to a number of innovations being highlighted as potential disruptive technologies. Augmented reality (AR) are rapidly becoming increasingly available, accessible and importantly affordable, hence their application into healthcare to enhance the medical use of data is certain.AR is the addition of artificial information to one or more of the senses that allows the user to perform tasks more efficiently. In a hospital, the details such as patient's temperature, pressure,and heart beat rate of the general ward are usually maintained as handwritten notes on a pad and hung on the patient's bed. Our system gives doctor a goggle which helps to identify patient's details using virtual reality technology.

KEYWORDS: AugmentedReality, Microcontroller, ZigBee,, Sensors

I. INTRODUCTION

AR interface so far has been used for a great number of task, and have shown a great promise for increasing users, performance compared to traditional GUI[3]. they provide a better understanding of spatial relations. Augmented reality is the technology that expands our physical world, adding layers of digital information onto it. AR. AR appears in direct view of an existing environment and adds sounds, videos, graphics to it. AR can be displayed on various devices: screens, glasses, handheld devices, mobile head-mounted displays. It involves technologies like S.L.A.M. (simultaneous localization phones, and mapping), depth tracking (briefly, a sensor data calculating the distance to the objects).AR plays a vital role in future of medicine. AR can help doctors access the latest and most relevant information about their patients. Augmented reality can be beneficial for healthcare professionals in two ways – in the aspect of education and training, and in the aspect of diagnostics and treatment providing access to real-time patient data. We use augmented reality to visualize the basic medical report of the patients[4]. The paper is organized in the following structure section 2 related work for augment reality, section 3 demonstrates the various sensors connected to the arduino, section 4 various sensor collect the information and then transmit to the goggles through the ZigBeetransmitter. Finally conclusion and future work and reference.

II. RELATED WORK

The"Vision based People Tracking for Ubiquitous Augmented Reality Applications " portrays about The task of vision based people tracking is a major research problem in the context of surveillance applications or human behavior estimation, but it has had only minimal impact on (Ubiquitous) Augmented Reality applications thus far[1].The "Stepping into the Operating Theater: ARAV - Augmented Reality Aided Vertebroplasty" tells about Augmented Reality (AR) for preoperative diagnostics and planning, intra operative navigation and postoperative follow-up examination has been a topic of intensive research over the last two decades. These papers gave some Basic idea to build the system.AR interface so far has been used for a great number of task, and have shown a great promise for

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III ARCHITECTURE DIAGRAM

The figure 1 shows the architecture which records the patient'sbasic details such as temperature, heart beat and pressure.The temperature ,pressure, and heart beat sensor are connected to the analog input pins of the ATmega 328 microcontroller. The details are displayed though an 16 X 2 LCD monitor connected to the digital pins of the microcontroller. The Zigbee transmitter helps to transmit the data to the goggle

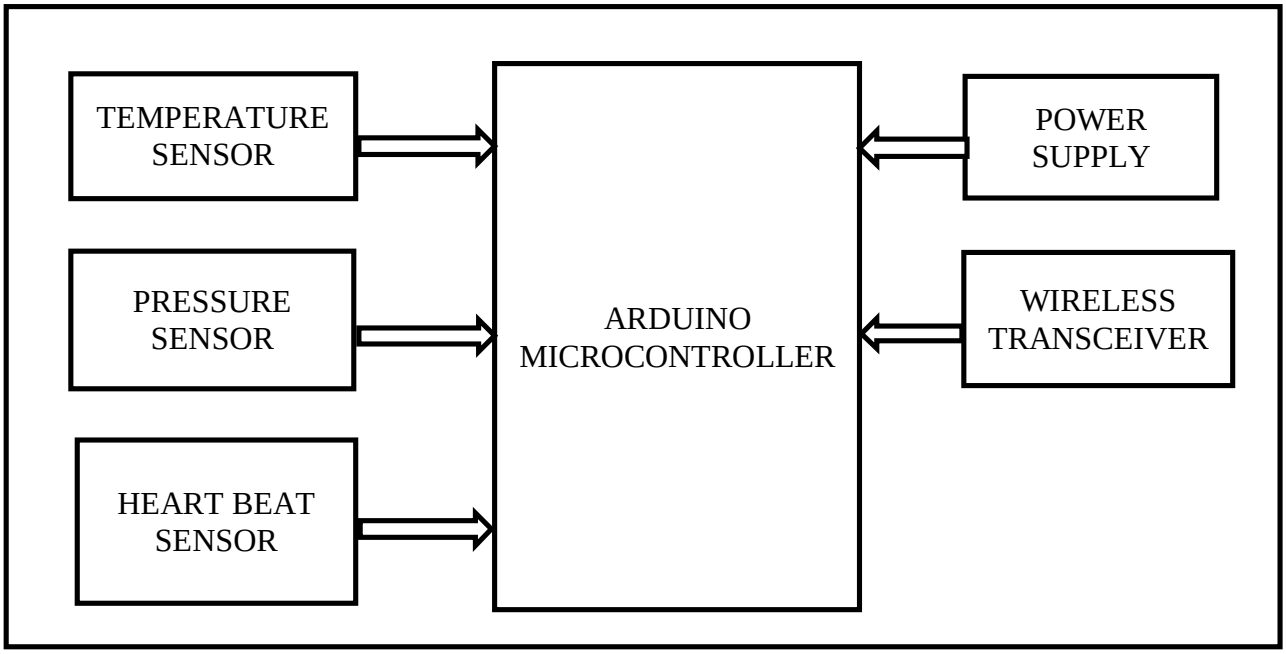

Figure 1-Patient Monitoring system

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IV. METHODOLOGY

4.1 Input Module

The microcontroller is connected to temperature, heartbeat and pressure sensor. The microcontroller is connected to an external power supply. These are placed near the patient bed. As soon as the patient gets admitted the details are inputed to the microcontroller through the sensors. The information are recorded in the microcontroller and sentto the doctor's goggles through wireless zigBee transmitter. The information is received through the zigBee receiver placed at the doctors goggle.The figure 2 showsthat the kit placed near the patients bed , the data is provided to the kit which is transferred to the goggle

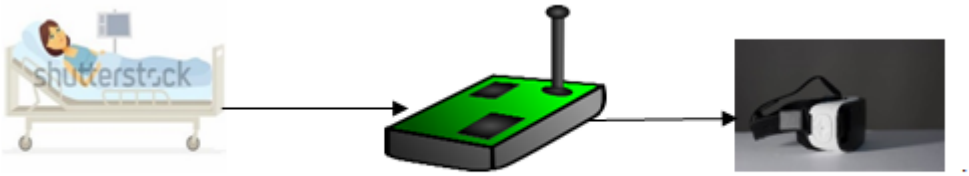

Figure 2 - Data sent from the patient to the goggle

4.2output Module

The ZigBeereceiver receives the information from the ZigBeetransmitter .theZigBee receiver then display the information of the patients using the OLED lens attached to the goggles. When the doctor enters the patient ward with the googles as soon as he goes near the patient the information gets transmitted using these information the doctor can analyse the critical patients and treat them first. The figure 3 showsthat the details of the goggle and its hardware arrangement. The block diagram of the goggle are 9V battery , virual reality ray, Zigbee receiver and wearable glass. The Zigbee receiver gets the information and display in the VR goggles

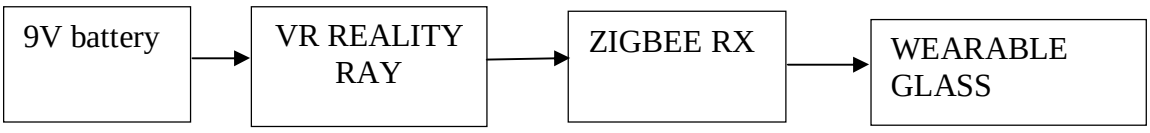

Figure 3- Block diagram of goggles

The figure 4 shows the image of the goggle in our project. The doctor wears the goggles and while visiting the patients he could see basic details of the patients as he moves on near to each patient .Earlier there was a notepad which had the details of the patient. The doctor had to read the note pad to get information which consumes a lot of time, which is overcome by our project. The ZigBee transmitter collects the patient's information about the patient and transmits to the goggle. The doctor now sees the information about the patient through the goggle. On analysing the patient information the doctors decides whether the patient is critical or normal. If normal the doctor moves to other patient otherwise the doctor takes more attention to the patient. The OLED lens display the temperature,pressure, and heart beat information about the patient

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Receiving section

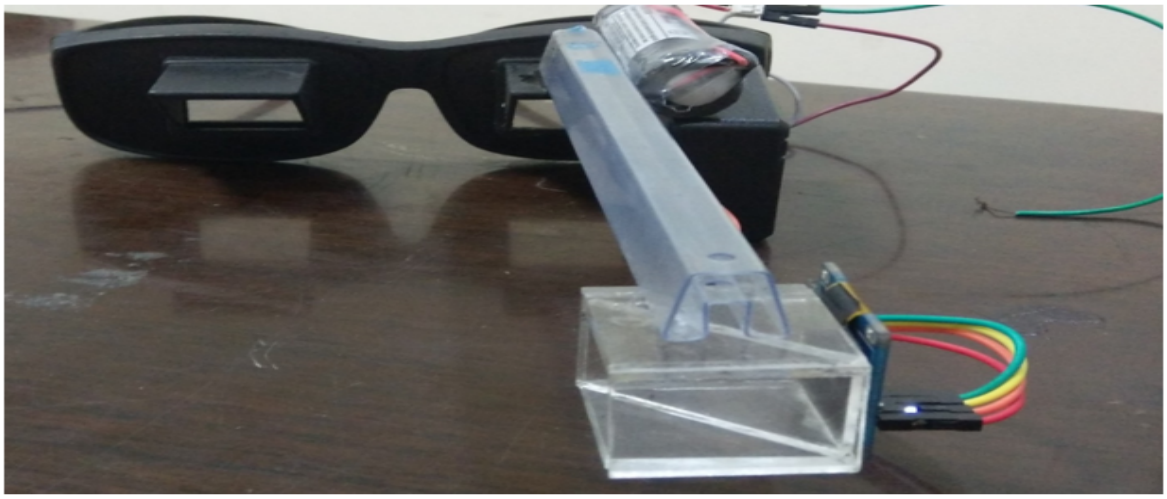

Figure 4 - Doctor wearable goggles

.3 Hardware used

We have used ATmega 328 microcontrollerzigbee transmitter and receiver, temperature ,heart beat and pressure sensor and a goggles with OLED lens which shows the patient details.

V. CONCLUSION AND FUTURE WORK

The proposed system helps the doctor identify the critical patient's faster by using the AR goggles and the microcontroller with sensors ,which displays the temperature pressure and heart beat of the patient which helps to classify if the patient requires immediate attention or not. This thus reduces the doctor time to a greater extent preventing the doctor to check the basic details moving to each patients bed.

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