A Novel Surgery Assistance System for Doctor's Using Augmented Reality

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Abstract **- Surgeons often look for technologies that will improve their work environment. They tend to adopt the first technology that allows their field to provide the best surgical and patient experience. The continuous development of the surgical field in the digital age has led to the highlighting of many things such as disruptive technologies in surgical practice. Reality (AR) is beginning to become more readily available, more readily available, and more important, which is why their system in health care to strengthen the medical use of data is guaranteed. Whether related to anatomy, surgical resection, or postoperative rehabilitation, applications are already being investigated for their role in their play. AR can hear the details of the installation of one or more sensors that allow the user to perform tasks efficiently. We propose a system in which important medical information is displayed on invisible mirrors embedded in the AR setting and thus integrated with the real world.**

Index Terms **- AR headset, Augmented Reality, Sensors**

INTRODUCTION

Taking continuous readings or measurements of temperature, heartbeat, blood flow of a patient had become a critical task for Doctor's. At the time of surgery these parameters play a major role to analyse the patient's health condition. If any one of the parameters vary and the surgeon did not realize about it then it may lead to death also. If at the time of surgery, they may lead to a critical task which may lead to confusion to the surgeon, even the patient's life also falls under danger. Examples for these conditions are we are seeing in daily newspapers as one surgeon mistakenly kept his gloves in patient's stomach, it is not due to carelessness of the surgeon it is due to the variation patient's and health parameters and the surgeon's assistant's didn't noticed them so, at the final step it lead to these situations. The sensors used to gather patient data's and display it in the display unit. In cases where doctor perform a critical operation, it is difficult for them to note the patient's data. So, to monitor the patient's data they get distracted easily causing accidents.

A. Objective: To enable a system to monitor patient's health through AR headset.

PROPOSED SYSTEM: In this project, the real time data of patients in hospital collected by the sensors attached to patients where the sensor measures values and is processed and sends to the doctors a glass of augmented reality wireless and alert in the event of an abnormal situation. The doctor can take appropriate action based on the patient's current health condition.

Fig-1. Data sent from patient to the goggle

Block diagram:

Transmitter section:

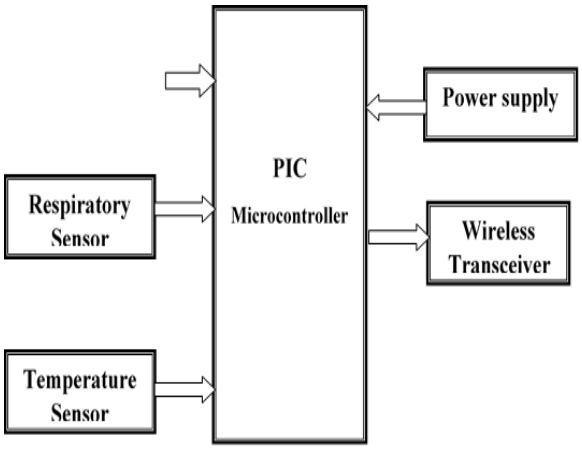

Fig-2. Transmitter section

BLOCK DIGRM EXPLAINTION

Our smart stretcher system has a number of sensors and hardware components for an effective way to achieve a smart stretcher .12v battery used to supply power to the PIC microcontroller operating with a 5v power supply. An ultrasonic sensor was supplied by a 12 V battery. Here the input voltage of the ultrasonic sensor is 3.3v-5v. Therefore, the 12v is converted to 5v using a voltage regulator that was placed in the power supply circuit using a TIP41 power transistor. Because it can achieve 4A maximum in spec. But in actual use it can only give me about 2A maximum. In addition, its body TO-220 is so easy to use with any size heatsink.7805 regulator. Because its body is the same as TIP41, without Zener diode and bias resistor. In addition, it has a ripple output of about 10mV with electrolytic capacitors (C1, C4) at the input and output. And both filter capacitors, C2, C3, to reduce spike voltage. Since it is a linear regulator. So while it is working. There is a voltage in the input and output of IC1 about 7 V. When 1 A is the current in a full load. So the output power is about 7 watts. It is hot We should mount it at sufficient heat .The PIC microcontroller is connected with all hardware and sensor components, the microcontroller also known as the heart of the system will control all the components to be connected with the controller Arduino Mega. It is specifically programmed for optimized applications with high reliability, the output of the force sensor is an analog signal and is therefore connected to the analog pin of the Arduino Mega. Depending on the analog voltage value from the force sensor, the motor speed is varied. For this to happen, we need to use the concept of PWM in the circuit. The inputs to the motor driver IC must be in the form of a PWM signal and are therefore connected to PICs 11 and 10 PICs, respectively, which are capable of generating PWM signals. When the system is powered on, the PIC waits for the button to be pressed. If the forward direction button is pressed, the PIC lowers the logic of input 1 and input 2 (Pin 3) of the motor driver IC (Pin 2) with a PWM signal. Therefore, the motor starts rotating in the forward direction. Similarly, if the reverse direction button is pressed, the PIC drives input 2 (pin 3) of the L293D is given a logic with the PWM signal and input 1 (pin 2) of the L293D. Therefore, the motor starts moving in reverse directions. The speed of the motor can be controlled in any direction using a force sensor as it controls the duty cycle. The output pin of the heartbeat sensor is connected to pin 8 of the picture. The LCD is connected to the PIC in 4-bit mode. The VCC and GND of the sensor are connected to the VCC and GND of the PIC microcontroller. The system will start counting pulses when we press the push button. Respiratory monitoring sensor up to a PIC microcontroller. The module, which was tasked with detecting the motion of its chest, required both an analog communication board and a level shifter to interface the 2.8V level of respiration with the 5V of the microcontroller. The wireless transceiver block will transmit all the patient's data. Here we are using respiration and the heartbeat data will be transmitted through the wireless transceiver, which is directly connected with the microcontroller, and then all the data is transmitted. For wireless augmented reality modules. When the augmented module received a description of the patient and demonstrated through the display.

WORKING PRINCIPLE

The microcontroller is connected to the sensors. The microcontroller is connected to an external power supply. These are placed next to the patient's bed. Once the patient has received the information it is fed into a microcontroller via a sensor. The information was recorded on a microcontroller and sent to the doctor's office via a ZIGBEE wireless transmitter. Details are available via the ZGBEE receiver filed by a physician from a physician. The ZIGBEE receiver receives data from the ZIGBEE transmitter. The ZIGBEE detector automatically displays patient information using an OLED lens attached to goggles. When a doctor enters the patient's ward through the channels as soon as he or she approaches the patient the information is transmitted using this information the doctor can diagnose the critical patients and treat them first. The ZIGBEE recipient receives the details and discloses them in AR goggles. The doctor wears worms and while visiting the patients he could see the basic details of the patients as he approached each patient. Previously there was a booklet with patient details. The doctor had to read the note pad to get the most time-consuming information, which is defeated by our project. The ZIGBEE referral machine collects patient information about the patient and transmits it to Goggle. The doctor now sees details about the patient with a goggle. In analysing patients' information, the doctors determined whether the

patient was serious or normal. These goggles are used during surgery as well. During surgery, the doctor will evaluate the patient's vital signs without the help of a nurse.

RECEIVER SECTION:

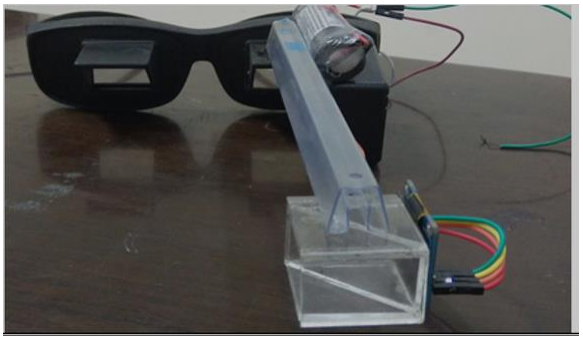

Figure 1.4-Receiver section

RESULTS

In our project Augmented reality based doctor assistant system was working as we expected ,the sensors attached with the patients will get the patient details of heartbeat data and the respiratory data and data are processed by the microcontroller and those data are transmitted to the patient data's are transmitted to the wireless transceiver, and the details are displayed to the augmented reality module successfully.

CONCLUSION

Augmented reality will truly change the way we view the world. With augmented-reality displays, which will eventually look much like a normal pair of glasses, informative graphics will appear in your field of view, in future audio will coincide with whatever you see. These enhancements will be refreshed continually to reflect the moments of your head. Augmented reality is still in the early stage of research and development at various universities and high-tech companies. Eventually, possibly by the end of this decade we will see the first mass-marketed augmented-reality system.

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