



DOCTORS ASSISTING WITH SMART GLASS USING INTERNET OF THINGS

Gokul Prasad.C, Assistant Professor, Department of Electronics and Communication Engineering, SNS College of Engineering Coimbatore, Tamilnadu 641107, India; gokul.c.ece@snsce.ac.in

Akash.B, **Akshay.N.**, **Nandha kumar.B**, UG Student, Department of Electronics and Communication Engineering, SNS College of Engineering Coimbatore, Tamilnadu 641107, India;

Maharaj.M Founder & CEO, BCBUZZ Technologies Pvt Ltd, Coimbatore, Tamilnadu 641107, India;

ABSTRACT

Few places benefit more from tech advances than hospitals. Indeed, patients in need of medical attention are much better off than they were a century ago. Furthermore, what were once considered miracles are now routine procedures for doctors in the developed world. Now, medical field AR (augmented reality) glasses will offer another major breakthrough in patient care. Not only can they radically improve a doctor's performance, they can improve the quality of patient care and significantly reduce overall costs. This is a major concern for hospitals that want to provide the best care in a cost effective way.

Keywords: Augmented Reality, Smart Glass, Internet of Things.

1. INTRODUCTION

Now-a-days, the medical electronics-sensors (E-sensors) are playing an important role in health care centres. The patient electronics-health (E-health) monitoring is one of the major advancements in research field. Here we use the temperature sensor, heartbeat sensor to monitor the patient's body temperature, pulse and heart rate respectively. Hence like the use of thermometer in home to check body temperature before doctor's consultation, this proposed model (devices) can be used to check the patient's health condition in home as first aid information to the concerned patient otherwise now-a-days consulting doctors or going to diagnosis centres become very costly in terms of financial aspect. To minimize this situation, we describe the design of a Arduino microcontroller based advanced/high performance integrated health portable monitoring system.

2.LITERATURE SURVEY

2.1 Hanna wuller, Jonathan Behrens, Marcus Garthaus, Sara Marquard & Harmut Remmers Proposed The aim of this scoping review is to provide an overview of the current research regarding AR in nursing to identify possible research gaps. This led to the following research question: "To date, what research has been performed regarding the use of AR in nursing?". A focus has been placed on the topics involving cases, evaluations, and devices methods have been used from A scoping review was carried out with the methodological steps outlined by Arksey and O'Malley (2005) and further enhanced by Levac et al. (2010).

2.2 Kevin S Tang, Derrick L Cheng, Eric Mi, Paul B. Greenberg A literature search was conducted using PubMed, Embase, Web of Science, Cochrane Library, and Google Scholar. This review followed PRISMA guidelines and included publications from January 1, 2000 to June 18, 2018. Inclusion criteria were experimental studies evaluating ARAs implemented in healthcare education published in English. Our review evaluated study quality and determined whether studies assessed ARA validity using criteria established by the GRADE Working Group and Gallagher et al., respectively.

2.3 Martin Eckert, Julia S Volmerg, Christoph M Friedrich Augmented reality (AR) is a technology that integrates digital information into the user's real-world environment. It offers a new approach for



treatments and education in medicine. AR aids in surgery planning and patient treatment and helps explain complex medical situations to patients and their relatives. This systematic and bibliographic review offers an overview of the development of apps in AR with a medical use case from March 2012 to June 2017.

3.EXISTING SYSTEM

When used correctly, augmented reality can enhance the perception of environmental conditions or situations. Knowledge about the user's surroundings becomes immersive and digitally enhanced with the help of sophisticated augmented reality technologies (e.g., adding computer vision, incorporating AR cameras into mobile phone, object recognition). Environment and object information is superimposed on the real world. AR can have a major impact on the growth of the organization. Workers and organizations can benefit from AR/VR technology by adding context, relevance and It will clarify a slightly elevated architectural features and identify the key components and interfaces required for an AR solution, according to the AR framework. In spite of the vast differences between AR framework. In spite of the vast differences between AR applications, tracking, registration, pose estimation, location, template matching, and data intravenous are some of the common functionality's customization to every aspect of the organization. Can have a major impact on the growth of the organization. Workers and organizations can benefit from AR/VR technology by adding context, relevance and customization to every aspect of the organization.

4.PROPOSED SYSTEM

Internet of Things (IoT) is the emerging paradigm, which contains huge amount of smart object and smart devices connected to the internet for communicating with each other. IoT devices are used in many fields which make the users' day to day life more comfortable. These smart devices are used to collect temperature, blood pressure, sugar level etc., which are used to evaluate the health condition of the patient. Communicating the collected information to the doctor, making accurate decision on the data collected and notifying the patient is the challenging task in the IoT. PHMS also notifies the patient with possible precautionary measures to be practiced by them. This system suggests the patient with medical care and next step to be followed in case of critical situation. we introduce a new way of implementing PHMS with Arduino Uno named as an IoT based Patient Health Monitoring System using Arduino. Data generated by the sensors are processed by arduino microcontroller ATMEGA 328P. ESP8266 provides unsurpassed ability to embed Wi-Fi capabilities within other systems. It offers a complete and self-contained Wi-Fi networking solution; it can be used to host the application or to offload Wi-Fi networking functions from another application processor. The data generated from arduino is available in the IoT website thinkspk.com with the use of Wi-Fi module. The PHMS also notifies the patient with possible precautionary measures to be practiced by them.

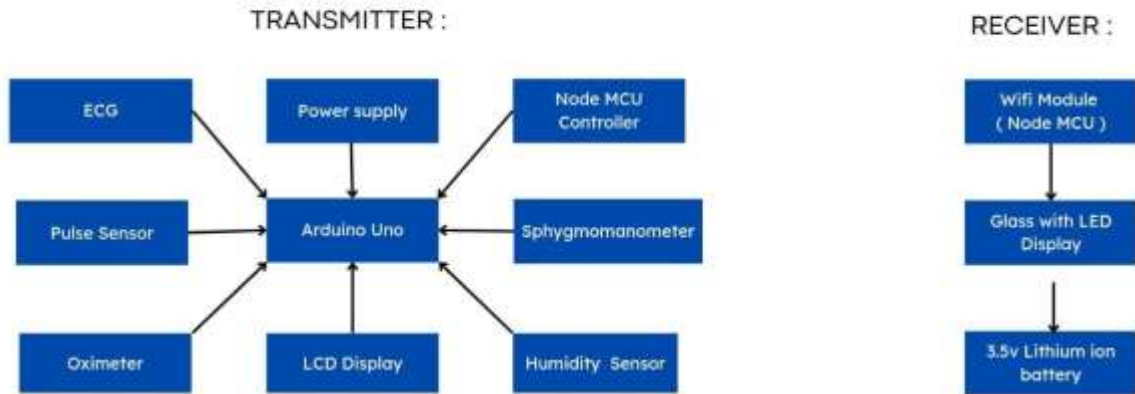


Fig:4.1 : Block Diagram

5.HARDWARE REQUIREMENT

5.1 ARDUINO UNO

The Arduino UNO is a standard board of Arduino. Here UNO means 'one' in Italian. It was named as UNO to label the first release of Arduino Software. It was also the first USB board released by Arduino. It is considered as the powerful board used in various projects. Arduino.cc developed the Arduino UNO board.



Fig 5.1: Arduino UNO

5.2 PULSE SENSOR

Plug-and-play sensor that is used to detect the heart rate data is known as a pulse sensor. This sensor is used by athletes, students, mobile & game developers, etc. This sensor clips on an earlobe or a fingertip connecting right to an Arduino board through jumper cables. In real-time, the pulse rate can be monitored through an open-source monitoring app.



Fig 5.2 :Pulse Sensor

5.3 TEMPERATURE SENSOR

Temperature sensors work by providing readings via electrical signals. Sensors are composed of two metals that generate an electrical voltage or resistance when a temperature change occurs by measuring the voltage across the diode terminals. When the voltage increases, the temperature also increases.



Fig 5.3: Temperature Sensor

5.4 PRESSURE SENSOR

A pressure sensor is a device for pressure measurement of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed. For the purposes of this article, such a signal is electrical.



Fig 5.4:Pressure Sensor

5.5 ESP8266 Wi-Fi

The ESP8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much Wi-Fi ability as a Wi-Fi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.



Fig 5.5: ESP8266 Wi-Fi Module

5.6 HUMIDITY SENSOR :

A humidity sensor is an electronic device that measures the humidity in its environment and converts its findings into a corresponding electrical signal. Resistive sensors measure the change of the humidity and translate it into a change in electrical impedance of the hygroscopic medium. Typically, the change of resistance to humidity follows an inverse exponential association, and almost varies from 1 K Ω to 100 M Ω .



Fig 5.6 :Humidity Sensor

5.7 ECG SENSOR :

An electrocardiogram (ECG) is a simple test that can be used to check your heart's rhythm and electrical activity. Sensors attached to the skin are used to detect the electrical signals produced by your heart each time it beats.



Fig 5.7: ECG Sensor

5.8 OXIMETER :

The pulse oximeter uses a cold light source that shines a light through the fingertip, making the tip appear to be red. By analyzing the light from the light source that passes through the finger, the device is able to determine the percentage of oxygen in the red blood cell.



Fig 5.8: Oximeter

6.SOFTWARE REQUIREMENTS



The Arduino UNO is programmed using the ARDUNIO IDE, our Integrated Development Environment common to all our boards and running both online and offline. The Arduino Integrated Development Environment (IDE) is a cross platform application (for Windows, macOS, Linux) that is written in functions from C and C++.

7.RESULT AND DISCUSSION

Based on the studies our project is proposed with a result as Medical field AR glasses can ensure that a patient can be monitored and a doctor can be assisted so that their performance in patient care can be improved in quality and significantly reduces overall costs. Medical field AR glasses can ensure that a doctor's clipboard is always at the ready. Consequently, doctors can use their immaculately-trained hands to save lives instead of handling documents. No Need to Fly-In the Experts medical professionals will be able to transcribe patient visits using voice technology. The AR smart glasses are equipped with this feature. Additionally, experts will no longer need to travel directly to patients. Smart glasses will allow doctors to provide remote training or offer over-the-shoulder support to other medical professionals in real-time. This will save patient care facilities immense time and money otherwise spent on travel or airfare



Fig 7.1: Output

8.CONCLUSION

Digital technology isn't new to the medical world. Indeed, medical professionals today regularly use their smartphones or computers to research symptoms and treatments. Digital healthcare plays an increasingly important role in healthcare today. Digital health applies digital transformation to the healthcare field, incorporating software, hardware and services. Traditional methods of communication and research will not disappear overnight. Our smart glasses provide a solution for that. Digital health innovations are designed to help save time, boost accuracy and efficiency, and combine technologies in ways that are new to healthcare. The application of information and communications technology to provide digital health interventions to prevent disease and improve quality of life.



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