DEVELOPMENT OF SURGICAL AND MEDICAL APPLICATIONS USING AUGMENTED REALITY AR

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ABSTRACT

Surgeons lookout regularly for the technologies that will enhance their operating environment. They are the early adopters of technologies that allow their field to offer a best surgical atmosphere and excellent patient experience. The step by step development of the surgical environment in this digital era has led to a number of innovations being origined as potential disruptive technologies in the medical and surgical workplace .Robust healthcare moniter is a requirement for both developed countries like Japan, where the cost of healthcare is high and security and privacy are critical issues and developing countries like India, where there is a more population ,inorder to handle hospitals and robust healthcare procedures are required. In current scenario doctors should visit the patient regularly and check the status. Situation may occur like nurse make mistake while noting the report.Here we have two modules a transmitter module and a receiver module.The transmitter module is at patients side and it consist of seven components that builds the module.

Keyword : - *Augumented Reality, Tracking, Health care ,Surgery, Sensor-based, AR goggles.*

I. INTRODUCTION

Augmented reality (AR) is refered a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. whose elements are augmented by computer-generated sensory input. The applications and related technologies for AR are attracting increasing attention from both the scientific community and companies originally involved in different research areas. In particular, the progress achieved in the fields of computer vision and mobile computing are mainly shifting the focus towards the development of systems for AR for mobile devices. AR creates a new and newer opportunities for exploring the mechanisms of humans interaction, and virtual and physical environments.

II. EXISTING SYSTEMS

In hospitals and robust healthcare procedures are required. Doctors should visit the patient regularly and check the status. Situation may occur like nurse make mistake while noting the report.

III. PROPOSED SYSTEM

AR plays a crucial role in hospitalized phase. It gives all the patients parameters to the doctor via wireless communication module Through the AR glass .In this existing system the IOT have a vital role to monitoring data in

cloud server with time and date.The main contribution is securely distributing the patient data in multiple data servers and employing the cryptosystems to perform statistical analysis on the patient data in AR Glass.Embedded Technique has implemented in real time Argument Glass.

3.1Methodology:

This can be implemented by having the doctors collecting data by the sensors attached to patients, once the sensor measures the values, it is processed and send to doctors to take appropriate action based on the condition. The data's like temperature and heart beat values of the patients are taken in analog form by using the sensors and they are converted to digital form using Arduino ADU in the transmitter model.

3.2 Modules:

A. Transmitter side:

1) Temperature sensor

'The world is getting warmer day by day.' and then in our day to day lives. But seldom do we wonder what it means. What is warmer? How warm is warm? To senses of human, temperature is only a subjective evaluation.

2) Proximity Sensor

A proximity sensor capture presence of nearby objects and for this it does notneed physical contact. There are different kinds of proximity sensors ,they are Inductive ,Capacitive ,Photoelectric and Magnetic.

3) Heartbeat sensor

The heart beats 72 beat per minute.It contracts or expands as they force blood from one region to another. The number of times the heart beats per minute (BPM), is the heart beat rate and the beat of the heart that can be felt in any artery that lies close to the skin is the pulse.

Specification:

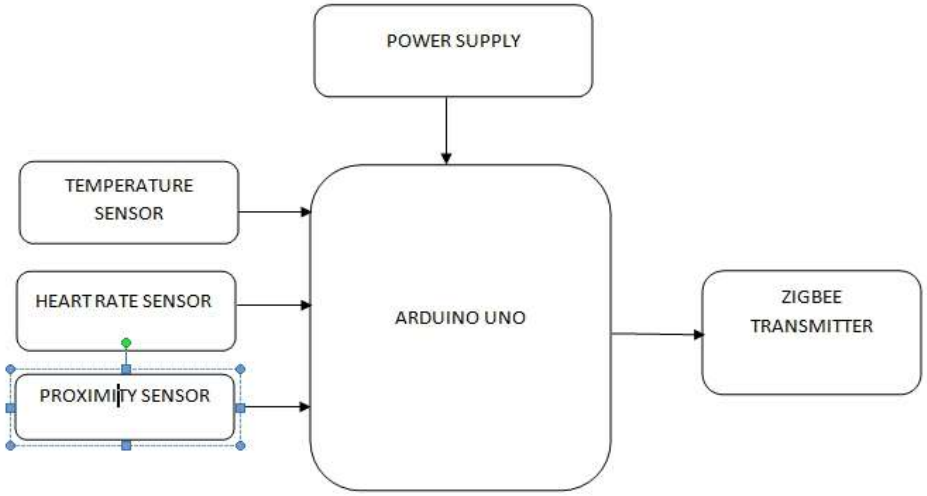
i. ATmega328-AU microcontroller with UNO Bootloader Installed.
ii. USB Programming Facilitated by the CH340G.
iii. USB-B Connector and cable included.
iv. Input voltage - 7-15V.
v. 0-5V outputs with 3.3V compatible inputs.
vi. 14 Digital I/O Pins (6 PWM outputs).
vii. 6 Analog Inputs.
viii. ISP Header.
ix. 32k Flash Memory
x. 16MHz Clock Speed.

ARDUINO UNO (ATMEGA 328)

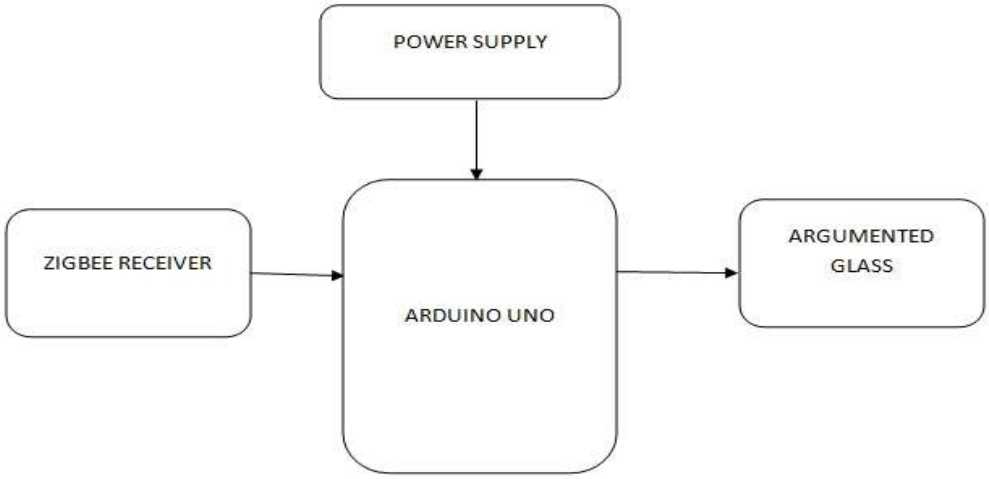
Arduino uno:

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Transmitter side



B. Receiver side

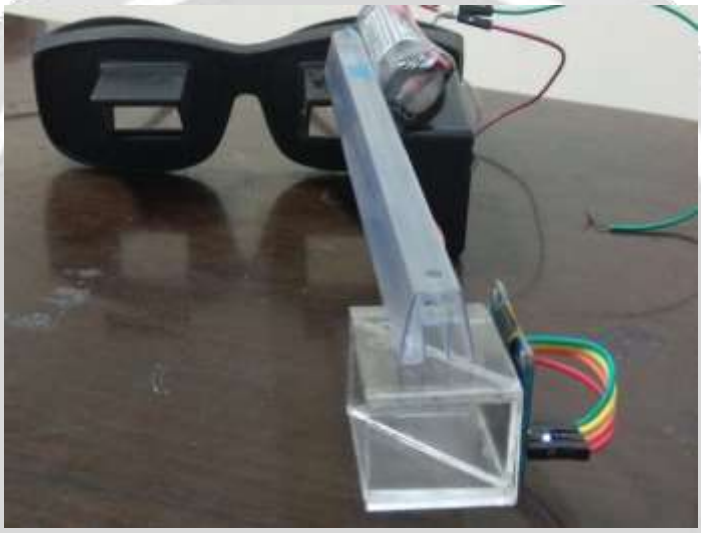


POWER:

The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

5V This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it. (3V3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

Augmented Glasses:



AR smart glasses are a wearable transparent device that is used to generate AR content within the space of the user's view point. While wearing such glasses , user′s can be able to see their physical surrounding as same as in the traditional glasses. However , user can see the superimpose additional content in the AR smart glasses such as Google Glass

IV. CONCLUSIONS

In this paper we have shown the main features of the architecture of a tool for the rapid prototyping of AR applications for automobile. The advantages that this new tool is expected to provide are:Rapid prototyping in an augmented environment. • Development of new interfaces (metaphors) of interactions for particular contexts. • Possible development of new formal techniques to ″predict″ and model user interactions. There are several possible scenarios in which the proposed tool can be used. Among these we can assume prototyping and simulation of user interactions with different environments such as mobile shopping (viewing and purchase of goods in a shop ″augmented″ with interactive elements), and mobile museum, in an interactive augmented museum tour.

VI. REFERENCES

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