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MEDICAL ANALYSIS USING VIRTUAL REALITY

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Abstract - Surgeons 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 surgical and patient experience. Virtual reality (VR) are rapidly becoming increasingly available, accessible and importantly affordable, hence their application into healthcare to enhance the medical use of data is certain. Whether it relates to anatomy, intra operative surgery, or post-operative rehabilitation, applications are already being investigated for their role in the surgeons. VR is the addition of artificial information to one or more of the senses that allows the user to perform tasks more efficiently. we propose a system in which important information for the doctors are displayed on semi-transparent glasses included in an VR-headset and therefore are mixed with the real-worldview.

Key Words: Virtual reality

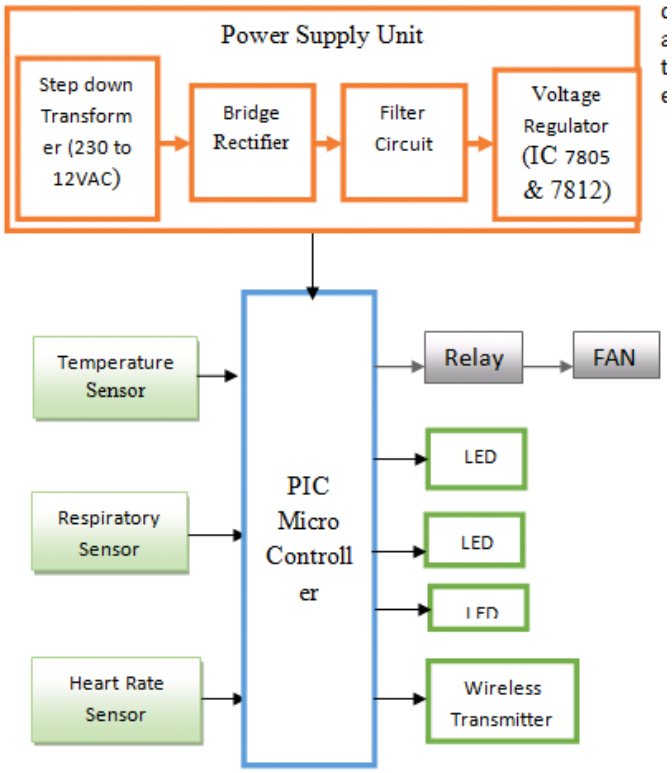
1. INTRODUCTION

Equity of access to healthcare and in particular primary care remains a challenging problem for the vulnerable population, particularly those living in the remote communities such as in Australia and Canada. This is paramount for those suffering from chronic diseases and the need of ongoing care, not just for the remote communities but for the general population. The lack of access to primary or community care has resulted in overcrowded emergency departments and overstretched health system. Healthcare innovations have been predominately focused on changes to structural and organizational framework and implementations limited to clinical health service settings and not the community settings where social determinants of health differ with demography. Developments in telehealth solutions have shown opportunities to overcome barriers to any infrastructural changes needed in community care settings and shortage of general practitioners, making virtual doctor visits plausible. However, lack of infrastructure of internet connectivity (particularly the remote and underserved communities), legislative framework and adequate reimbursements model for consultations, limits its adoption. Although reimbursement models for telehealth video consultations are emerging in countries such as US and Australia, both patient acceptances, in particular, and 1 this work was done while the author visited CSIRO as a vacation student. clinician acceptance remains limited and needs expansion for any success and cost-effectiveness. Recent advances in virtual reality and augmented reality (AR) show tremendous potential to enhance video consultations to create 3D telepresence for consumer or patient experience. While most of these AR technologies, such as the Microsoft HoloLens, are head-mounted wearable devices, and research activities have focused mainly on medical procedural training. Such technologies will have low compliance to patient uptake due to discomfort and weight of wear on their head and limited memory capacity, and being costly. Emerging AR technology available through mobile devices such as smartphone and tablet, for instance the iOS App Holo, shows potential of patient uptake due to its delivery over lifestyle technologies. The objective of this paper is to demonstrate the viability of enhancing telehealth

1.1 PROPOSED SYSTEM In this project, the real time data of patients in hospital collected by the sensors attached to patients once the sensor measured the values then it is processed and send to doctors augmented reality glass through wireless and alert if abnormal condition occurs .The doctor can take appropriate action based on the patients current health condition.To measure the human body temperature, we LM35 sensor.

LM35 sensor measure temperature more accurate than a using a thermister since it is industrial temperature sensor. Heart beat sensor provides a simple way to study the function of the heart which can be measured based on the principle of psycho- physiological signal used as a for the virtual for the stimulus for the virtual reality system. The Arduino Uno is a microcontroller board based on the ATmega328. A simple pragmatic solution to this problem can be made using Arduino, a credit card sized single board computer. The dengue is identified from the immunity calculations and is intimated to the doctor. The other parameters of the patient are constantly monitored and logged to the cloud. If anyone of these parameters go beyond a threshold level, it is notified to the doctor immediately

1.2 BLOCK DIAGRAM



3. SYSTEM CLASSIFICATION:

3.1 HARDWARE COMPONENTS:

- Power supply unit
- PIC Microcontroller
- Temperature Sensor
- Respiratory Sensor
- Heart Rate Sensor
- Relay
- FAN
- Wireless Transmitter
- LED

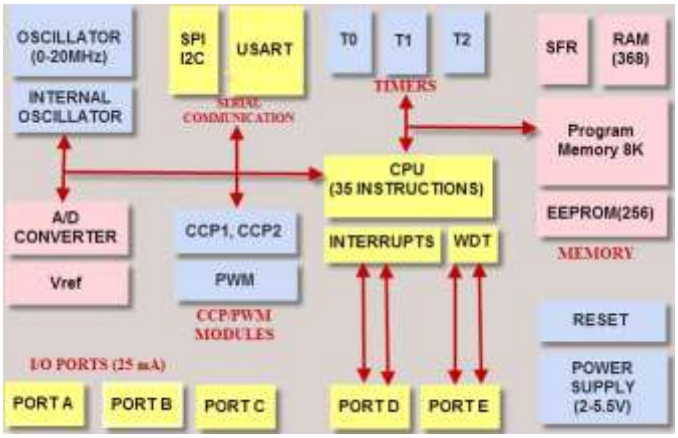
3.2 SOFTWARE REQUIRED:

- MPLAB IDE
- Embedded C

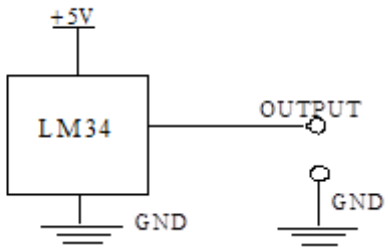
HARDWARE COMPONENTS:

3.1.1 PIC MICROCONTROLLER:

PIC Microcontroller is a type of microcontroller derived from microchip technology. The main advantage of this PIC is it uses FLASH MEMORY technology. It allows PIC to reprogram itself. It is less expensive and easily available.



3.1.2 TEMPERATURE SENSOR:



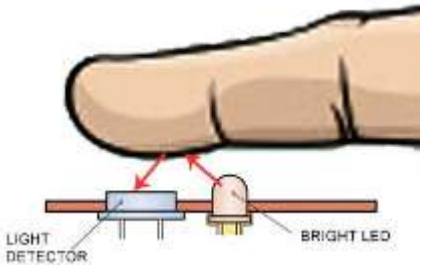
We use the LM34 series of temperature sensors. The LM34 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Fahrenheit temperature. The LM34 thus has an advantage over linear temperature sensors calibrated indegrees Kelvin.

3.1.3 RESPIRATORY SENSOR:

The Respiration Sensor is used to monitor breathing. It also measures relative depth of breathing. It is measured using high sensitive and thermal mass flow meter. The air or gas flow from a heating element located between temperature-sensitive resistors is heated slightly here. A method for volume flow measurement involves measuring the pressure drop via a flow element.

3.1.4 HEARTBEAT SENSOR:

Heart beat sensor give digital output of heat beat when a finger is placed on it. It works on the principle of light modulation by blood flow through finger. When the heart beat detector is working, the beat LED flashes in unison with each heartbeat. This digital output can be connected to microcontroller directly to measure the Beats Per Minute (BPM) rate.



3.1.5 WIFI MODULE:

WI-FI-802.11B is the Wi-Fi module used in the device which is used to store the information in the cloud and can be retrieved whenever needed. The advantage is that Wireless laptop can be moved from one place to another place.

3.2.5 OLED DISPLAY:

An organic light-emitting diode (OLED or Organic LED), also known as an organic EL (organic electroluminescent) diode is a LED in which the emissive electroluminescence layer is a film organic compound that emits light in response to an electric current.

3.2.1 EMBEDDED C:

Embedded C is used to integrate hardware with software components. C Standards are used in Embedded C. The devices such as mobile phones, washing machine etc., are based on Embedded C programming. The components working on microcontroller is mostly based on Embedded C.

4. CONCLUSION:

The heartbeat, temperature and respiratory rate of the patient is measured by respective sensor and it is converted into digital output by directly connecting them into PIC controller. It is displayed in OLED display.

5. RESULT:

6. REFERENCES:

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