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Automatic Operating Ventillator by Checking Blood Oxygen Sensor and Using GPS Tracking – Cloud Based

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ABSTRACT:

This document gives an overview of the numerous studies that have been conducted.Lungs are used to breathe in humans. In each breath, they use a push mechanism. The process of inhalation and exhalation takes place. We designed this ventilator toassist folks in a Covid situation. It is fairly inexpensive and accessible. This can be utilized in an emergency case if someone has an issue with their lungs or breathing. The air bag is pushed by a motor system. When oxygen levels are low, this method can be utilized to show information on a small screen. The oxygen levels are low. The entire system is controlled by a PIC [Peripheral Interface Controller] microprocessor, which includes a buzzer that detects low oxygen levels. A blood oxygen sensor is used in our system.

Keywords – DIY ventilator, airbag,breathing problem,BPM, respiration

INTRODUCTION

Ventilators are available in a variety of forms and methods for supplying oxygen to the body. Manual ventilators, such as bag valve masks and anaesthetic bags, require users to hold the ventilator to their face or to an artificial airway with their hands while breathing. Mechanical ventilators are computer or pneumatically controlled ventilators that do notrequire the use of an operator. Mechanical a battery or a wall socket (DC or AC), while other ventilators operate on a pneumatic system that does not require electricity. There are a multitude of ventilation systemsavailable, which fall into two main (and then lesser) categories: negative-pressure mechanisms, which are older technology, and positive-pressure mechanisms, which are morepopular. The power of a small microcontroller, such as the Microchip PIC microcontroller (MCU) or the ds PIC digital signal controller, is often used in an embedded system (DSC). These microcontrollers combine a microprocessor unit (similar to the CPU in a personal computer) with peripheral circuits and other circuits on the same chip to create a tiny control module that requires few other external devices. For low-cost digital control, this single device can be incorporated into other electronic and mechanical components. An embedded controller differs from a personal computer in that it is dedicated to a single task or group of tasks. A personal computer is built to run a wide range of programmes and link to a wide range of external devices. Because an embedded controller only has one programme, it can be manufactured cheaply with only enough computer power and hardware to do that one purpose. A personal computer's heart is a rather expensive genericcentral processing unit (CPU), which is surrounded by a plethora of other peripheral hardware(memory, disc drives, video controllers, network
interface circuits, etc.). circuits on the same chip, and with relatively few external devices. Often, an embedded system is an invisible part, or sub-module of another product, such as a cordless drill, refrigerator or garage door opener. The controller in these products does a tiny portion of the function of the whole device. The controller adds low-cost intelligence to some of the critical sub-systems in these devices. An example of an embedded system is a smoke detector. Its function is to evaluatesignals from a sensor and sound an alarm if the signals indicate the presence of smoke.
A little programme in the smoke detector either runs indefinitely, sampling the signal fro low-power "Sleep" mode, waiting for a signal from the sensor to wake it up. The alert is then sounded by the programme. Other features, such as a user test function and a low battery indicator, could be included in the software. While a personal computer with a sensor and audio output could do the same purpose, it would not be acost-effective option (nor would it run for years on a nine-volt battery!). Embedded designs incorporate inexpensive microcontrollers into everyday objects such as smoke detectors, cameras, cell phones, appliances, autos, smart cards, and more.

LITERATURE REVIEW

A Multisensor Data-Fusion Approach for ADL and Fall classification – This researchdiscusses a cutting- edge method for monitoring elderly persons and people with neurological disorders (e.g., Alzheimer). A multi sensor technique allows the system to detect crucial events such as falls or prolonged inactivity, monitor the user's posture, and send alerts to careers. This paper focuses on clever algorithms in particular. created for the classification of activities of daily living (ADL), which uses data from inertial sensors implanted in the user device.

Multi-User Assistive System for the User Safety Monitoring in Care Facilities – This paper discusses the creation of a multi-user assistive system for monitoring elderly persons and people with neurological diseases (such as Alzheimer's) while they arein social care or health facilities. Wearable gadgets are used to monitor user dynamics, and a dedicated wireless network is used forcommunication.

A Novel Approach for High-SpeedWireless Pre-fall Detection Multisensory System – It is critical to improve the living standards of the elderly, as well as to provide them with competent emergency treatment. Seniors frequently experience an emergency situation as a result of unintentional falls. A system with smart wireless sensors that monitors and protectselderly and patients from falling is being developed using a revolutionary approach based on effective pre-fall detection. This research shows how to monitor and identify falls before they happen using a low-cost, high-speed sensory system.

Activity Recognition for Indoor Fall Detection Using Convolutional Neural Network –Falls are a big health concern among the elderly. As a result, if you want to strengthen your independence, you should invest in a dedicated monitoring system. This paper uses a convolution m the smoke sensor, or it lies inactive in alow-power "Sleep" mode, waiting for a signal from the sensor to wake it up. The alert is then sounded by the programme. Other features, such as a user test function and a low battery indicator, could be included in the software. While a personal computer with a sensor and audio output could do the same purpose, it would not be a cost-effective option (nor would it run for years on a nine- volt battery!). Embedded designs incorporate inexpensive microcontrollers into everyday objects such as smoke detectors, cameras, cell phones, appliances, autos, smart cards, and more.

PROPOSED WORK

During quarantines, an IoT-based wearable gadget is used to measure and record vital signs and health problems for remote patients. Design and implementation of a 3Dmodel system with all sensors and microcontrollers as a prototype that can be worn, removed, and carried easily. During an emergency, an application peripheral interface (API) like a web front end is used to access the patient record and notify the notified responders. Real-time GPSdata of the patient in quarantine, alerting authoritiesto theseverity of the covid-19 outbreak.
Extract patient health data from the API andarrange for the use of hospital facilities and critical conditions accordingly

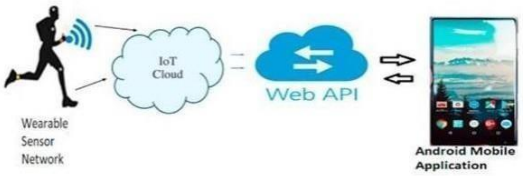

Fig 1 - Architecture unit of Smart Health Care

System

The Internet of Things (IoT) has made remote health monitoring systems simple, convenient, and accessible for measuring and recording patient parameters in a comfortable setting. Sensors, actuators, microcontrollers, and cloud-enabled systems are among the IoT components that can help patients at home instead of having to visit the hospital frequently. The suggested IoT- based health monitoring system can measure physiological parameters and health symptoms in COVID-19-affected patients and transfer their data to an application peripheral interface (API) that works as a database for perusing and infection monitoring. In addition, the work reveals the location of a possible infected patient in quarantine or a self-isolated location. The saved database system is used to notify medical authorities in the event of an emergency.Symptoms of the patient's illness and the assigned location The suggested wearableIoT layer, cloud layer, and mobile or webfrontend layer are the three layers. aspects of the proposed work is that it has the potential to have a big influence in terms of alerting medical authorities based on the geographic data of possibly sick people, allowing them to foresee and assess the situation. A database is developed to store and retrieve allof the healthcare data of probable infected patients in order to examine the situation.

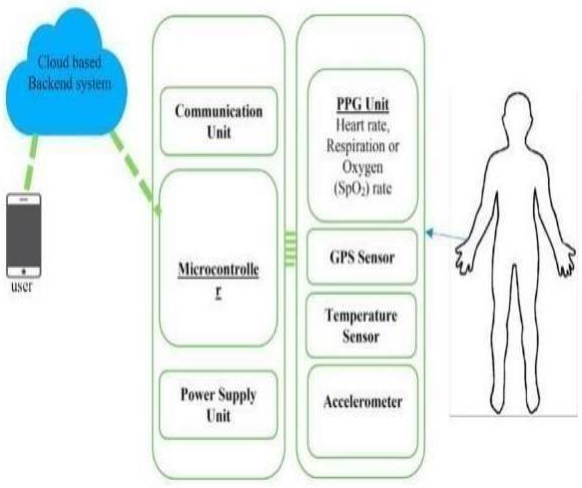

Fig 2 - IoT Design Framework for theproposed system design

HARDWARE REQUIREMENTS

The hardware used in the experiment are listed below:1. PIC16F877A:

The PIC microcontroller PIC16f877a is one of the industry's most well-known microcontrollers. This microcontroller is veryeasy to use, and its coding or programming isalso quite simple. Because it employs FLASH memory technology, one of the key advantages is that it can be write-erase as many times as needed. It features a total of 40 pins, with 33 pins dedicated to input and output. Many pic microcontroller projects use the PIC16F877A. PIC16F877A also have much application in digital electronics circuits.

Fig 3 – PIC16f877a

2. PHOTO DIODES:

Character recognition circuits usephotodiodes. In science and business, photodiodes are used to precisely detect the intensity of light. Photodiodes are more sophisticated and faster than PN junction diodes, and are hence commonly employed for lighting control and optical communication.

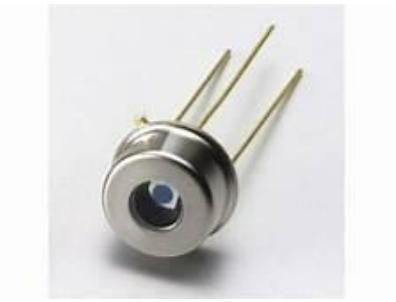

Fig 4 - Photo Diode

3. LCD DISPLAY:

LCD (Liquid Crystal Display) is a type of flat panel display that operates primarily with liquid crystals. Millions of pixels makeup a display. A liquid- crystal display (LCD) is a flat-panel display or other electronically controlled optical device that uses liquid crystals and polarizers to manipulate light.

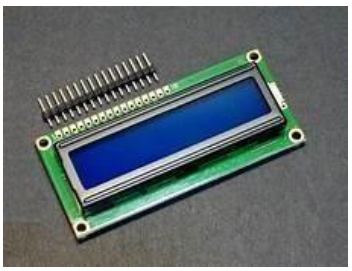

Fig 5 - LCD

SOFTWARE REQUIREMENT

1. MPALB IDE:

Microchip's PIC and dsPIC microcontrollers are supported by the MPLAB IDE, which isan integrated toolset for developing embedded programmes. Because it providesa single integrated environment for developing code for embedded microcontrollers, it's called an Integrated Development Environment, or IDE.

2. MC PROGRAMMING LANGUAGE -EMBEDDED C:

Embedded C programming is critical for getting the microcontroller to execute and perform the desired activities. Embedded C programming is made up of a number of functions, each of which is made up of a set of statements that are used to carry out certain tasks

METHODOLOGY

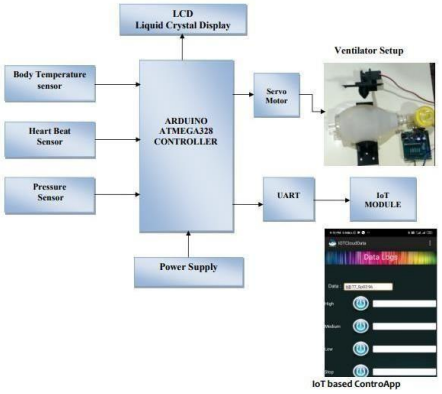

Fig 6 - Block Diagram

The proposed system is set up to use a web-based application as a peripheral interface for medical authorities, as well asan Android-based mobile app for patient family responses. Both interfaces are really synced in order to gather and notify health-related data. To learn more about the design architecture of an IoT- basedwearable device, which is represented by three different parties: On the user side, the prospective infected patient (PIP) has a wearable sensor device that may be worn on any wrist or ankle as a bracelet and is used to perceive the patient's physiological health symptoms as well as their location to the API cloud processing system. There are two people involved at the receiving end, one of whom is the registered user's family member who is in charge of receiving alerts and notifications about the patient's serious health signs while under quarantine? The Application peripheral interface (API) housed on a web domain with cloud flare for storing and retrieval is the other party on the receiver side.Medical authorities have authority over this API in order to monitor and manage the critical scenario in which medications and consultations are provided. The API interface is linked to a mobile Android application that provides frequent updates on the patient's health symptoms while under quarantine.

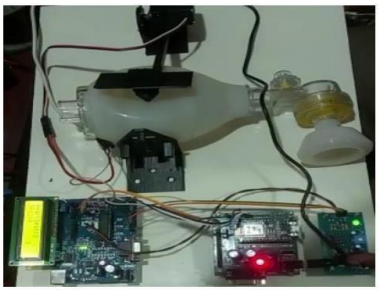

Fig 7 - Design

RESULTS

The overall circuit diagram is shown in Fig. 5 with single BLE nano senseconnected to Arduino to know the human activity recognition by usingdifferent axial sensors also to track and locate the potentialinfected patient in real time conditions. The sensors connected to the microcontroller are used to collect, measure, and analyze the real time data.

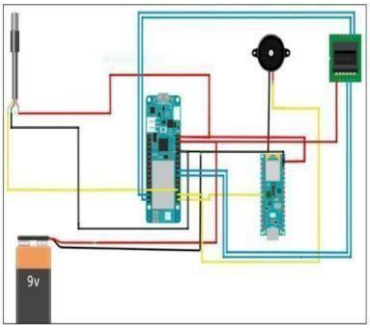

Fig 8 - Circuit diagram

According to the World Health Organization [36], the temperature is the most important COVID-19 indication; anyone with a temperature of more than
37.5 may be infected. Figures 7 and 8 depict a report generated by a system that is overheating. Cough and SpO2 levels, as well as heartbeat, can be monitored as well. It's crucial to note that the cough count is based on the total value of cough waves, which aids the case manager in determining the severity of the symptoms and avoiding any false positives.

ID	Device ID	Patient ID	Temperature	Heart Rate	Oxygen Saturation Spo 2	Cough Count Sec	Longitude	Latitude	Status	Updated at
794	121	121	38.5	79	99	0	58.434722	23.585718	active - potential infection (not tested)	2021-01-22 03:46:07
793	121	121	38.5	79	99	0	58.434722	23.585718	active - potential infection (not tested)	2021-01-22 03:46:06
792	121	121	38.5	79	99	0	58.434722	23.585718	active - potential infection (not tested)	2021-01-22 03:46:05
791	121	121	38.5	77	99	0	58.434722	23.585718	active - potential infection (not tested)	2021-01-22 03:46:01
790	121	121	38.5	76	99	0	58.434722	23.585718	active - potential infection (not tested)	2021-01-22 03:45:58
789	121	121	38.5	76	99	0	58.434722	23.585718	active - potential infection (not	2021-01-22 03:45:57

Fig 9 - System report

CONCLUSION:

During the quarantine period, a wearable gadget prototype is being developed to monitor the Covid-19 health symptoms of potentially infected patients (PIP) from remote places. The three-layer wearable body sensor, web API layer, and mobile front-end layer of the 3D prototype design for an automated health care systemto minimise stress and provide a method ofcommunication between doctors, medical authorities, and family responders for an automated health care system. The wearable sensor layer is utilised to measure temperature, heartbeat, SpO2, and cough count, and each layer has its unique functions. In addition, the patient's GPSlocation data is sent to medical authorities in real time, and family members are notified to decrease the stress. The application peripheral interface layer is in charge of storing, collecting, and analysingdatafor the application.to monitor and control the social life and manage during the pandemic era. learning ramework for coronavirus.

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