

IoT based smart Ambu Bag compressing machine

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ABSTRACT

Novel corona virus (COVID-19), an ongoing pandemic, is threatening the whole population all over the world including the nations having high or low resource health infrastructure. The number of infection as well as death cases are increasing day by day, and outperforming all the records of previously found infectious diseases. This pandemic is imposing specific pressures on the medical system almost the whole globe. The respiration problem is the main complication that a COVID-19 infected patient faced generally. This project aims to overview the existing technologies which are frequently used to support the infected patients for respiration. Among many types of ventilators Bag Valve Mask (BVM) is a manual ventilator in which a bag is pressed to deliver air into the lungs of the patient. We described the ventilator which delivers breaths by compressing a conventional bag-valve mask (BVM) with a pivoting cam arm, eliminating the need for a human operator for the BVM throughout the review. A comparative analysis among the developed devices with necessary challenges and possible future directions are also outlined for the proper selection of affordable technologies. It is expected that this paper would be of great help to the experts who would like to contribute in this area.

Keywords: Personal Identification, BPM rate sensing, Body temperature sensing

1. INTRODUCTION

In our India Covid situation has become worst than before. India needs ventilators to fight against corona. Due increase in the number of patient, managing patient has become very difficult task for Doctors and other authorities. Also cost of the ventilations very High. So Motivation of Project is the convenience of patient Doctors and Hospital authorities in Healthcare System. So solving the Problem By using different sensor like temperature sensor, heartbeat sensor, Arduino and to develop affordable ventilators is our main idea.

Ventilators are one of the most important devices to keep COVID-19 patients in the most critical condition alive. As the global demand for ventilators is increasing and there is shortage of ventilators in our country as well, also managing patients during this time is a big task, Based on survey it is found that there is a need of affordable Low-cost ventilators in India to fight against COVID -19, also managing patients during this time challenging task and it is intended to develop a low cost Smart Ambu -Bag Compressing Machine for Low Cost Ventilators.

2. PROPOSED SYSTEM

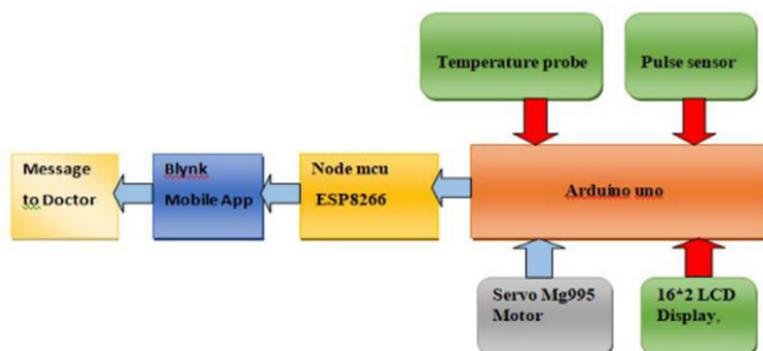


Figure1. Block Diagram

3. SYSTEM DESIGN

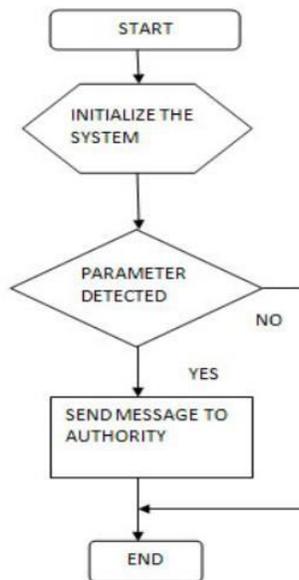


Figure2. Flow chart

From the algorithm we will come to know how the system works with all possibilities, When the power supply is given to the arduino, module will start, once the supply is on the sensors will start to sense the temperature and pulse rate. If the major variation is detected then the message will send to the authorities. If the major variation is not detected by sensor then everything is fine.

4. IMPLEMENTATION OF THE SYSTEM

A.Arduino Uno



The arduino uno is a used as processor in our project. All the sensors, Wi-Fi module and servo motor will give input to the arduino uno and after getting input arduino uno will take process on it and gives output.

B. Servo Motor MG995



The Ambu-Bag compressing mechanism is operated with a servo motor which is connected to Arduino used for the compression and expansion of the ambu bag by its forward and reverse rotation.

C. Node MCU the ESP8266 Wi-Fi module



Arduino is in serial communication with the Wi-Fi module NodeMcu to connect with the internet and display real-time parameter from the cloud on blynk mobile app.

D. Temperature Probe Sensor & Pulse Sensor



It is connect with Arduino and check continuously the body temperature and pulse rate of patient and display on LCD with which the doctors and other authorities can easily monitor the patient without human to human interaction.

E. Blynk Software



Fig. 5.1.1: Output View

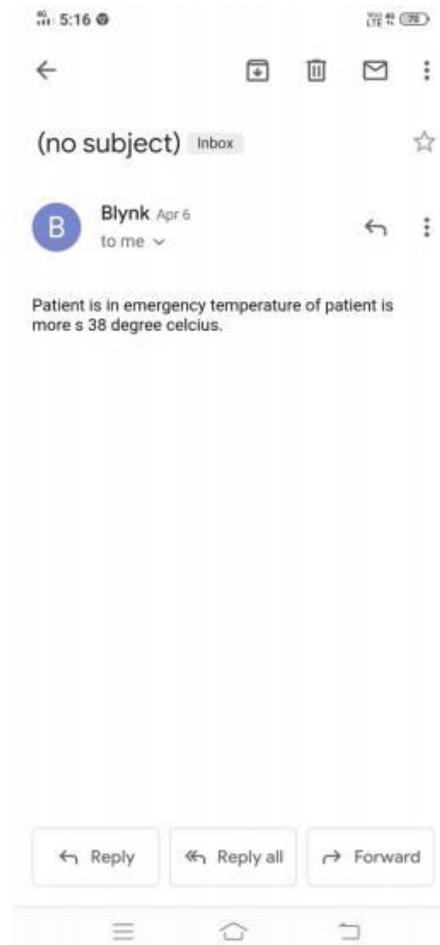


Fig. 5.1.2: Output View

The user friendly android application connect to NodeMcu with the internet and display real-time parameter from the cloud.. The system will also send automatic cloud messages if the monitor parameter goes below or above their limits and doctor was not present nearby patient The main device in the system is Arduino who takes all the decision and controlling actions, remaining other modules are communicate with the controller.



In this system we use sensors like Temperature sensor and Pulse rate Sensor, we also use LCD and buzzer for emergency. To monitor the patient and send the message to authority and doctor we use NodeMCU esp8266 module. To control this all we used Arduino as a controller. The Ambu-Bag compressing mechanism is operated with a servo motor which is IoT Based Smart Ambu Bag Compressing Machine connected to Arduino which acts as brain of the system. The Arduino is in serial communication with the Wi-Fi module NodeMCU to connect with the internet and display real-time parameter from the cloud. We have developed user friendly android application and LCD with which the doctors and other authorities can easily monitor the patient. The degree of compression or the output of servo motor can be controlled by adjusting potentiometer knob provided on the machine. And the system will also send automatic cloud messages if the doctor was not present near by patient.

5. CONCLUSION

All in all, our final hardware met our expectations quite well. We focus mainly on monitoring to patients without human-to-human interaction. This system has low power consumption, low cost and is convenient way to control real-time monitoring for unprotected school bus. This system is useful while shifting patients from ICU or home to ambulance or if needed at any accident site. It helps persons who perform first aid by systematic easy approach, even less experienced persons can easily operate it. Easy to reprogram if any changes are required in the system. Overall, we consider the project a success.

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