ISSN No:-2456-2165

Covid-19 Monitoring and Detecting Band

Ashwini R Malipatil
[1]Associate Prof., Dept. of Information Science & Engineering
RajaRajeshwari College of Engineering
Bangalore, India

Brundha S P
[3]Student, Dept. of Information Science & Engineering
RajaRajeshwari College of Engineering
Bangalore, India

Neha Singhal
[2]Associate Prof., Dept. of Information Science & Engineering
RajaRajeshwari College of Engineering
Bangalore, India

Ashika P
[4]Student, Dept. of Information Science & Engineering
RajaRajeshwari college of Engineering
Bangalore, India

B S Vidyashree
[5]Student, Dept. of Information of Science & Engineering
RajaRajeshwari College of Engineering
Bangalore, India

Abstract:- The Novel Coronavirus (COVID-19) has infected more than 16 crores people throughout the world. Most of the healthcare systems in advanced countries have become worse because of the coronavirus and people who are affected with COVID-19 are asymptomatic or manifest mild symptoms. The new framework helps in tracing along with temperature and oxygen saturation level that is used to, monitor person health status. It provides an alert message for the person and for the respective health department if there is any variation in health status it also alerts to maintain social distance.

Keywords:- *COVID-19, Temperature, Oxygen Saturation.*

I.INTRODUCTION

From 2019, the occurrence of respiratory disease caused by SARS-COV2 virus is called as coronavirus (COVID-19) which has been affected many people globally. Initially it was discovered in China, the spread increased in less span of time. On June11th, 2020 the total number of infected cases was 12,653, 45 and the death number was 563,517 lives worldwide. The most common symptoms of coronavirus is tiredness, fever, sore throat, loss of smell and taste, nasal congestion. It transmits directly from person to person through respiratory droplet. During the incubation period, the symptoms increases and depends upon the patient condition. The usage of sanitization facemask, face shield and social distance has shown positive results in disease spread.

The IoT plays an important role in the present century since they are been embedded in electronics, software, sensors, and network links, such as computers, houses, vehicles, and perhaps other structures, allows these structures to collect and share information. The paper introduces an IoT based band that can monitor and detect symptoms of COVID-19 of the individual with the help of various sensors. Monitoring is process of keeping continuous track of individuals temperature, oxygen saturation, the location information are live streamed on health department website. The detection is an action of identifying variations in the monitored information along with the location of the person. According to WHO monitor, detect and track is a measure taken to reduce the spread of virus hence tracking also plays an important role in the band. The location is live streamed on on the website in the form of longitude and latitude with the help of GPS.Social distancing is a method similar to bird behavior where one person is separated from another person of atleast 6 feet which is also included in the band by sending an alerting message to maintain distance with the help of ZigBee technology which is a WLAN.the website in the form of longitude and latitude with the help of GPS.

II.MATERIALS AND METHODS

A. Wearable sensing and Telehealth Technology with potential applications in the coronavirus pandemic.

The paper depicts about the COVID-19 tracing model that helps tracing infected with the help of IoT. The model is divided into features like mobile server provider application, citizen- application and IoT based. Contemporary steps for COVID-19 virus control are not applicable for animals and other moving objects. This model provides proof for RFIID concept which helps in contact tracing.

The system presents three prototype block chain smart contracts which will be used in further development. In addition it can be used in understanding human connectivity; contact spread and develops policies to reduce the future increase of COVID-19 virus. The panic of mass surveillance and the data misused has quick containment of outbreak like corona-virus (COVID-19) pandemic. According to the paper the number of COVID-19 infected

people and the data rate continuously growing. Due to this, infection tracing are absolutely necessary for controlling spread of virus. The IoT based framework developed for following infected patients provides system based detection which has not been included in previous model. The aptness of the model is to combine real-time symptoms information; it can be used to understand infection spread network, human contact information and certain rules to prevent the outspread of virus.

B. Emerging Technologies and Sensors that can be used during the COVID-19 pandemic

Coronavirus disease has been appeared as a pandemic with lot of serious illustrations. It has affected a lot of world health systems of vulnerable populations, in most of the world health systems it has resulted death. It has affected a lot of health communities in an unexpected way.

The goal is to enable technologies and systems with different applications for controlling covid-19 issues. This article provides various features like- A wearable device suitable for monitoring populations who are at the stage of risk, it also provides health status of the individual, provides suggestion for the patient to get admitted on the basis of the status, it detects the disease and takes suitable control measures for patients depending upon their symptoms, health technologies for detecting and diagnosing of Covid-19.

C. Review on Emerging Internet of Things Technologies to fight the COVID-19

The coronavirus has busted out in almost 13 crores people, the coronavirus disease various from asymptomatic, symptomatic, mild symptomatic and coronavirus leads to death in most of the cases. In order sense and detect at early stage, we introduce a band.

The IoT band provides early identification; isolate, infected and tracing the people with positive cases. The IoT consists of Radio-frequency identification [RFID], Global Positioning System [GPS] are increasing demand by providing required solutions to overcome the challenges. The article resolves different kinds of technologies and their applications used in tracking, surveillance, as well as screening. This paper provides overall knowledge of the exsisting and proposed system, IoT based solution to decrease COVID-19 virus, also provides a well-defined network for preventing, predicting the disease.

III.PROPOSED SYSTEM

In the view of the current situation and considering the objectives we decided to develop a smart wearable band that can overcome all the struggles faced by the health department. The band acts as bridge between the patients and doctor reducing contact with the patient continuously. The wearable helps the individuals to follow the precautionary rules to avoid the spread of virus in mass.

The band provides various features like monitor, detect, track, secure and follow. During monitor it collects the temperature and oxygen saturation information from the sensors and displays on the IoT dashboard with the help of Wi-Fi. Detecting performs action whenever there are variations in this information and displays the location of the individual on the dashboard. Security is also important aspect as it helps to avoid disconnect of band from the wrist as it sends location whenever the band is been removed. Following rules and precautionary measure is also chief principle in order to protect an individual from the virus attack, hence the alerting system is adopted to remind maintain distance between two individuals which can be called as social distance.

A. *Block Diagram of Proposed System*

The model is built with the help of arduino promini microcontroller to which various sensors are connected. Sensors are one that measure input from its environment and converts into data that can be read by humans. The device consists of three sensors namely temperature DS18B20, oxygen saturation SpO2, and IR sensor. Temperature sensor DS18B20 is a gadget which evaluates temperature of human body and converts the input data into digital data to record. Similarly, SpO2 sensor is electronic device for measuring oxygen saturation level estimations in the finger using two LEDs one in the red region and other in infrared region of the spectrum. Infrared (IR) sensor measures radiations in the environment this sensor is used to avoid detection of band from the wrist. Global Positioning Satellite (GPS) is used to track the location with the help of satellite. The information collected from the sensor has to be displayed on the IoT dashboard with the help of NodeMCU which is open source prototyping board. Social distance is also included in the model that works based on ZigBee technology which is a wireless LAN. The process of maintaining between two individuals is known as social distancing. During social distance the model is divided into two parts like transmitter and receiver, the transmitter sends the data in the form of binary digits to the receiver on the basis of frequency it evaluates the distance between the input output devices based on the bandwidth an alert message are sent to individual if the social distance is not maintained. The buzzer act as an alerting system in order to alert the individuals.

ISSN No:-2456-2165

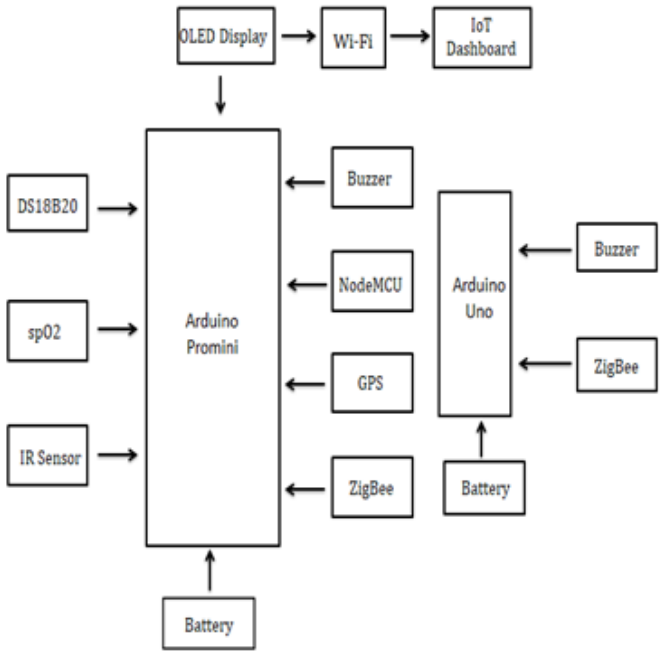

Fig. 1 Block Diagram

B. *Flow Chart Diagram*

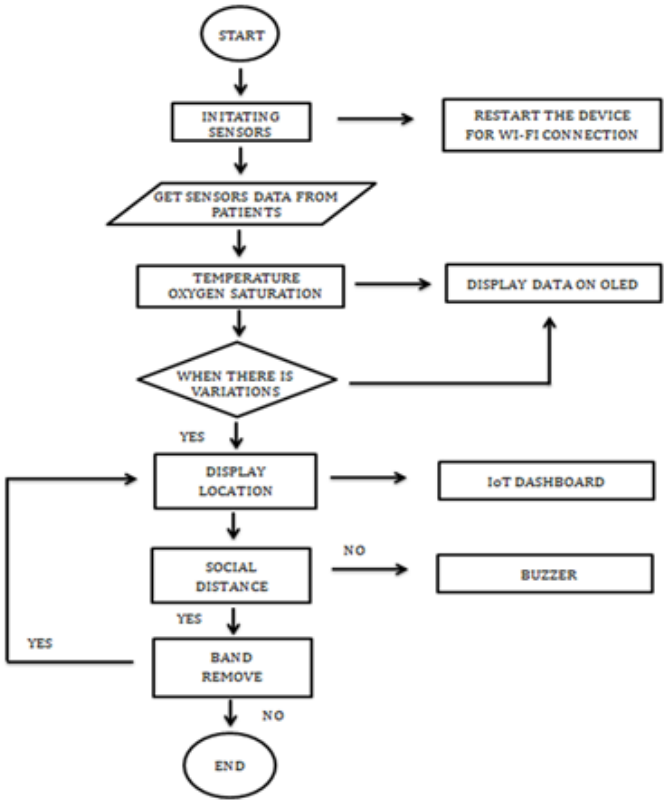

Fig. 2 Flow Chart

IV. RESULTS

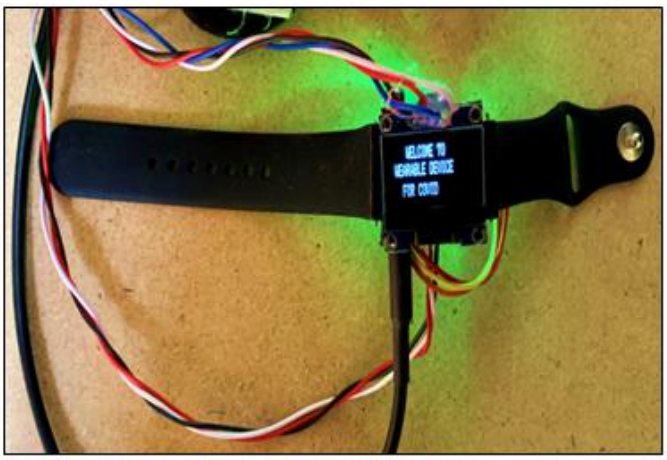

Fig.3 Wearable band that displays the data on OLED

The above is a figure of a band that is designed for safety of the people during COVID-19.The band displays the temperature, oxygen level and gives warning when the band is removed from hand.

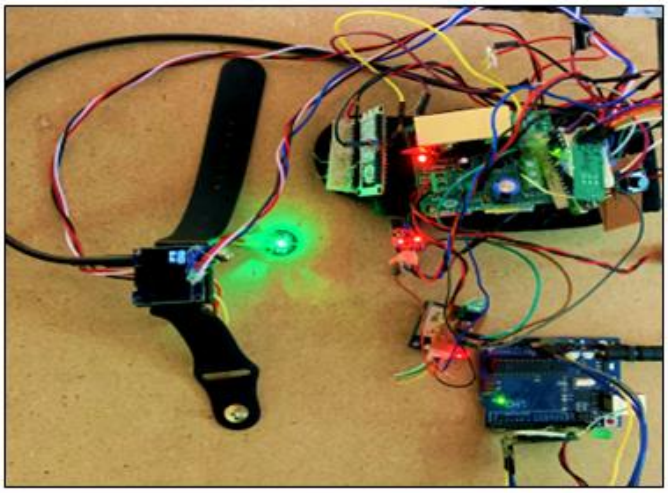

Fig.4 Microcontroller with transmitter and receiver for social distance.

The figure illustrates complete project in which band is connected to the microcontroller to which other components are connected like NodeMCU, IR sensor, Zigbee for social distance. The social distance works basis on ZigBee that consists of transmitter and receiver as shown in figure transmitter is connected to the main microcontroller and receiver is another model with ZigBee buzzer and LED.

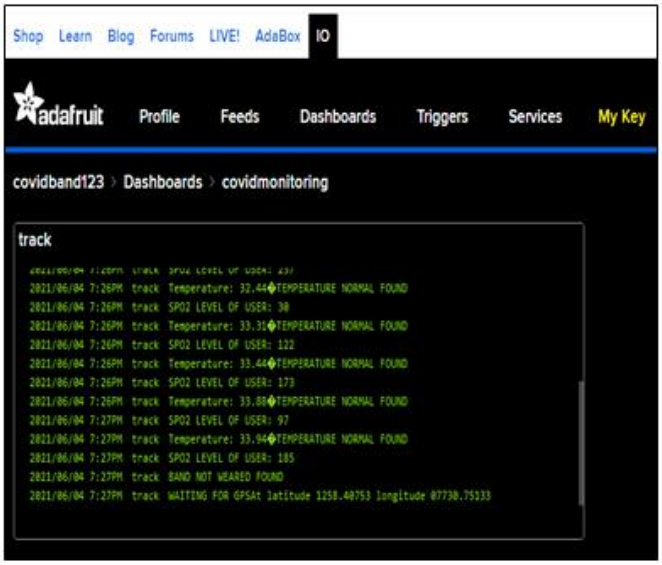

Fig.5 IoT Dashboard that displays live streaming of the patient data.

The dashboard is a web interface where the health department can monitor the patients and take precautionary measures to overcome the spread of virus. The dashboard provides information like temperature, spO2 level, location, the location is displayed in the form of longitude and latitude when the band is removed and also when there is variation in body temperature.

V.CONCLUSION

As medical facilities cost are getting rebel and reduce service quality there is a need to go beyond usual cost-cutting technique while ensuring good patient outcome mainly in the COVID-19 pandemic. Our project showcases an advance method for monitoring where the doctors are unable to monitor their patients. The project focuses on population that are more vulnerable to COVID-19 virus mainly old age people and further can be used for observing highly disabled patients. The project comes with an IoT device which can collect measurements like temperature and SpO2. These measurements are then processed and are displayed on the OLED display, at the same time as reading are passed to the IoT dashboard through the Wi-Fi module. The health department can view the real time measured value of the patient and also it is also made possible to view the location whenever there is an increase in the measurements or when the band is removed from the wrist.

From future perspectives, we will develop two sensor modules categorized as wearable and non-wearable modules to get real-time CoVID'19 suspected medical health parameters. An initial experimental setup of these gadgets has been proposed in this research.

REFERENCES

[1]. Pathinarupothi, R. K., Durga, P., & Rangan, E. S. (2018). IoT based smart edge for global health: Remote monitoring with severity detection and alerts transmission. IEEE Internet of Things Journal, 6(2), 2449-2462.

[2]. Fred Pannic, "New AI-Based Fever Detection Cameras for Crowds Help Limit Coronavirus Spread," 2020.https://hitconsultant.net/2020/04/06/new-ai-based-fever-detection-cameras for-crowds-help-limit-coronavirus-spread/.

[3]. G. Vaidyanathan. (Apr. 2020). Aarogya Setu: Major Surveillance, Few Safeguards in Modi Govt COVID Tracking App. Huffington post. Accessed: Jun. 18, 2020. Available: https://www.huffingtonpost. In/entry/aarogya-set surveillance-covid-tracking-app_in_ 5e8d6e26c5b6e1d10a6bdea6

[4]. R. Shibasaki. (2017). Call Detail Record (CDR) Analysis: Sierra Leone. https://www.itu.int/en/ITU-D/Emergency Telecommunications/Documents/2017/Reports/SL/D012A0000CA3301PDFE.pdf

[5]. "Guidelines for the Implementation and Use of Digital Tools to Augment Traditional Contact Tracing," Contact Tracing Resources from CDC; https:// www.cdc.gov/coronavirus/2019ncov/downloads/php/guidelines-digital-tools-contact tracing.pdf.

[6]. G. Deshpande and B. Schuller, ''An overview on audio, signal, speech, language processing for COVID-19,'' 2020, arXiv: 2005.08579.Available: http://arxiv.org/abs/2005.08579.

[7]. Exposure Notifications: Helping fight COVID-19. Accessed: Jul. 20, 2020.Available: https://www.google.com/covid19/ exposure notifications/

[8]. V. Chamola, V. Hassija, V. Gupta, and M. Guizani, "A Comprehensive Review of the COVID-19 Pandemic and the Role of IoT, Drones, AI, Blockchain, and 5G in Managing its Impact," IEEE Access, vol. 8, pp. 90 225–90 265, 2020

[9]. Y. Mendelson et al., "Multi-channel pulse Oximeter for wearable physiological monitoring," presented at the 2013 IEEE International Conference on Body Sensor Networks, 2013.

[10]. A. Kumar, K. Sharma, H. Singh, S. G. Naugriya, S. S. Gill, and R. Buyya, "A drone-based networked system and methods for com bating coronavirus disease (COVID-19) pandemic," Future Generation Computer Systems, 2020.

[11]. WHO. (2020). Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). Accessed: Aug18, 2020.

[12]. G. Vaidyanathan. (Apr. 2020). Aarogya Setu: Major Surveillance, Few Safeguards in Modi Govt COVID Tracking App. Huffington post. Accessed: Jun. 18, 2020. Available: https://www.huffingtonpost.

[13]. M. Salath, C. L. Althaus, R. Neher, S. Stringhini, E. Hodcroft, J. Fellay, M. Zwahlen, G. Senti, M. Battegay, A. Wilder-Smith, I. Eckerle, M. Egger, and N. Low, ‘‘COVID-19 epidemic in Switzerland: On the importance of testing, contact tracing and isolation,’’ Swiss Med. Weekly, vol. 150, Mar. 2020, Art.
[14]. eHealth Network. Mobile Applications to Support Contact Tracing in the EU’s Fight against COVID-19. EU’s Fight a Report. Common EU Toolbox for Member States Version 1.0 15.04.2020. Accessed: Aug. 28, 2020.
[15]. S. R. Choudhury. (Mar. 25, 2020). Singapore says it will make its contact tracing tech freely available to developers. Accessed: Aug. 18, 2020. Available:https://www.cnbc.com/2020/03/25/coronavirus-singapore-to-make-contact-tracing-tech open source.html.
[16]. V. Chamola et al., “A Comprehensive Review of the COVID-19 Pandemic and the Role of IoT, Drones, AI, Blockchain, and 5G in Managing its Impact,” IEEE Access, vol. 8, 2020, pp. 90,225–65.
[17]. H. S. Dhillon, H. C. Huang, and H. Viswanathan, “Wide-Area Wireless Communication Challenges for the Internet of Things,” IEEE Commun. Mag., vol. 55, no. 2, Feb. 2017, pp. 168–74.
[18]. E. H. Mamdani and S. Assilian, ‘‘an experiment in linguistic synthesis with a fuzzy logic controller,’’ Int. J. Hum.-Comput. Stud., vol. 51, no. 2, pp. 135–147, Aug. 1999, doi: 10.1006/ijhc.1973.0303.
[19]. Murali, D. Rao, D. R., Rao, S. R., & Ananda, M. Pulse Oximeter and IOT based cardiac monitoring integrated alert system. In 2018 International Conference on Advances in Computing, Communications and Informatics (ICACCI) (pp. 2237-2243).
[20]. G. Maclaren et al., "Preparing for the most critically ill Patients with COVID-19: the potential role of extracorporeal Membrane oxygenation," JAMA, 2020