A Survey on Feature of Smart Watch

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ABSTRACT: As the planet is encountering an outrageous stage due to erupt with Coronavirus disease, this contamination has provoked numerous difficulties. We have been adhering to the standards of keeping up the social removing as well as singular neatness to keep this disease at edge. At times it gets hard for a person to control the appropriate separation. One needs to keep up to meet the norms of social distancing to keep oneself safe from the impact of coronavirus. This paper has established a social distance smart band application to avoid the virus effect, which can detect the temperature of the object/person and its exact position from an individual wearing the smart band. This creation will not only assist or direct the individual, but it will also be conscious of the internal heat level of the approaching individual. In this way, during these pandemic conditions, the person wearing the watch would become familiar with how to keep himself out of danger.

Keywords: Smart watch, social distancing, temperature detection, distance detection, virus, Pandemic.

INTRODUCTION

In the last week of 2019 while the world was ready to welcome the year 2020 many local hospitals in Wuhan, China reported an unusual number of cases who had severe pneumonia without clear cause and they were not responding to any form of existing vaccine or medicines. Soon after, a seafood market in the Hunan region of China was linked to all these cases. A wholesale seafood market in the Hunan region of China had a thousand number of stalls who were selling fish, chickens, bats, snakes, rabbits and many other wild animals. These cases showed a very high human to human transmission rate which was further increasing as the days progressed.

An initial hypothesis was formulated that this was a new type of coronavirus that evolved in the animals being sold in the seafood market of Wuhan. This resulted in a fear that it could be similar to the sars epidemic of 2002 which had infected 8000 people and killed 774. But they were all wrong because this coronavirus was going to be something much worse. By early January 2020 about 59 suspected cases were picked up from all local hospitals in Wuhan and isolated in the "JINYINTAN" hospital in Wuhan. Out of this 59 suspected cases 41 were confirmed in the year 2019 with the novel coronavirus infection. Their isolation was too late and before their isolation these cases had infected hundreds of others, that eventually infected 1000 and thus starting the 2019 novel coronavirus epidemic[1].

Once started as the localized epidemic in central china quickly started to spread in the china provinces in a manner of a few weeks. This spread was escalated by the Chinese New Year when thousands of tourists were out of their home. The situation became denser when cases in other countries were also reported, which were transmitted by the national travelers [2]. Soon after that several new cases were reported from Germany, Thailand, Japan, Australia, United States, Russia and other dozens of new countries leading to a global pandemic situation. The epidemic cost its first death on January 9th 2020.

By looking at this tough phase due to the outbreak of covid-19 virus, which has led to many difficulties. Because of these outbreaks people have been following the guidelines of maintaining social distancing as well as personal hygiene to keep this virus at edge[3]. This major aim and objective of this paper is to guide the people about social distancing and also it will help the watch bearer to know the temperature of the incoming person. A wearable watch has designed that uses a type of sensor which will tell the person who is wearing it about the distance wherein he/she has to maintain so as to keep themselves out of the coronavirus danger. This gadget will also inform the person, if someone crosses that 1.5 m distance or he/she is nearer to the person who is wearing that gadget. This will eventually help in maintaining the norms of social distancing and create hassle free movement. The gadget will consist of beep alarms and led strips which will indicate accordingly[4]. This gadget also comes with integrated temperature sensors which will sense the internal body temperature of the incoming person and display the same on the led panel provided in the watch.

Essentially, our watch will never at any point let the individual who is wearing our watch come in contact with the other individual who is a Coronavirus possible carrier. Since the watch is designed in such a way that it will detect everyone with whom our watch holder is meeting in day-time and in evening time as well. If by chance our watch holder comes in the contact to such individual whose internal heat level is high then our watch will rapidly check that individual's internal heat level and will turn the LED red to show that the approaching individual may have the indications, in light of the fact that the internal heat level's is high and possibly he is experiencing fever or could be a tainted through Coronavirus. Since our watch is intended to keep up social separation so regardless of whether the watch doesn't detect any individual with high temperature inside a range of 1.5 m around the watch holder it will caution the individual and will signal in the event that anybody comes nearer than 1.5m[5].

REVIEW OF LITERATURE

Tejaswini Mishra et. al. had proposed a smartwatch which can digitally measure vital signs in real time application such as monitoring health condition and illness. As we know that in the current time the global coronavirus pandemic is rising at a high rate. Therefore, by utilizing smartwatch data from the infected individuals identified from a cohort of over 5000 participants, the proposed smart watch can help in investigating early, pre-symptomatic detection of COVID-19. From physiological and activity data, it was demonstrated that coronavirus infections are associated with alterations in heart rate, steps and sleep in 80% of coronavirus infection cases. If the virus is not detected, then the changes in the remaining patients often occurred with chronic respiratory/lung disease. Importantly the physiological alterations were detected prior to, or at, symptom onset in over 85% of the positive cases (21/24), in some cases nine or more days before symptoms. Here the author declared that through regular surveys one can track physiological changes with symptom onset and severity. Therefore, to detect onset of coronavirus infection in real-time a smart watch is designed which can detect 67% of infection cases at or before symptom onset. The research provides a roadmap to a rapid and universal diagnostic method for the large-scale detection of respiratory viral infections in advance of symptoms, highlighting a useful approach for managing epidemics using digital tracking and health monitoring [6].

In this research paper the author Giorgio Quer et. al. had proposed an app in the user's smart phones that collects the data identified by the smartwatch which comprises an activity tracker data, as well as self-reported symptoms and diagnostic testing results, from individuals in the United States, and have assessed whether symptom and sensor data can differentiate COVID-19 positive versus negative cases in symptomatic individuals. 30,529 participants had been involved in this enrolmentand out of which 3,811 reported symptoms were collected. With the above method of symptoms detection, 54 people were reported positive and 279 were reported as negative for COVID-19. With the detection it was found that a combination of symptom and sensor data resulted in an area under the curve (AUC) of 0.80 (interquartile range (IQR): 0.73–0.86) for discriminating between symptomatic individuals who were positive or negative for COVID-19, a performance that is significantly better ($P < 0.01$) than a model that considers symptoms alone (AUC = 0.71; IQR: 0.63–0.79). Such continuous, passively captured data may be complementary to virus testing, which is generally a one-off or infrequent sampling assay[7].

Dhruv R. Seshadri et. al. had proposed a wearable sensor for covid-19 where a call to action to harness our digital infrastructure for remote patient monitoring and virtual assessments.The COVID-19 pandemic has brought into sharp focus the need to harness and leverage our digital infrastructure for remote patient monitoring. As current viral tests and vaccines are slow to emerge, therefore a need for more robust disease detection and monitoring of individual and population health, which could be aided by wearable sensors. While the utility of this technology has been used to correlate physiological metrics to daily living and human performance, the translation of such technology toward predicting the incidence of COVID-19 remains a

necessity. When used in conjunction with predictive platforms, users of wearable devices could be alerted when changes in their metrics match those associated with COVID-19. Anonymous data localized to regions such as neighborhoods or zip codes could provide public health officials and researchers a valuable tool to track and mitigate the spread of the virus, particularly during a second wave. Identifiable data, for example remote monitoring of cohorts (family, businesses, and facilities) associated with individuals diagnosed with COVID-19, can provide valuable data such as acceleration of transmission and symptom onset. This manuscript describes clinically relevant physiological metrics which can be measured from commercial devices today and highlights their role in tracking the health, stability, and recovery of COVID-19+ individuals and front-line workers. Our goal disseminating from this paper is to initiate a call to action among front-line workers and engineers toward developing digital health platforms for monitoring and managing this pandemic[8].

CONCLUSION

By designing and introducing a vast variety of applications, the coronavirus pandemic has vigorously reformed the health care and management situation. A few weeks ago, convalescent exercise was transformed to advanced application across the entire country area to identify infected individuals and preserve social distance. This paper has an advanced application in which a smart watch helps to recognize the infected person around an individual along with the exact location of an individual or object.This smart watch consists of an IR temperature sensor, an ultrasonic max-botix sensor, a camera, an LED bulb and an LCD monitor where the temperature sensor measures the incoming person's body temperature. The ultrasonic max-botix sensor helps to measure the exact location and position of the entity and the object. If the individual comes close to the user, the user can easily identify the individuals and maintain social distance with the collected data to carry this damaging deadly virus typo to its edge. To detect the incoming person's gesture, a camera is mounted in the smart watch. If the incoming user discovers running nose, cough and high temperature data, then the wearable user of the smart watch can keep himself safe from getting infected and also maintain social distance. This method can be very beneficial in keeping a person healthy in the future because neither the coronavirus is the first deadly virus nor the last of the same.

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