

IT KALEIDOSCOPE

Theme : Technological Innovations Against Coronavirus

DOZEE- A Contactless Health Monitoring Device

Pandemics like the Covid-19 have been threatening the human race since forever. Past records show that many diseases such as SARS, Spanish Flu, Ebola and more have been the causes of mass havoc in the whole world but with each such epidemic or pandemic, the human civilization has found new ways to survive and develop. Although, technology cannot stop the onset of such diseases but can definitely help to prevent the spread, warn and educate the masses and also to empower people who are affected by the situation. It also prevents miscommunication between the government authorities and citizens, helping to maintain a state of law and order.

Today, as the Coronavirus pandemic rages in the world, various companies and entrepreneurs have come forward to help deal with the situation in innovative ways. It is well established that every person needs to sleep for a certain number of hours according to their age and health factors and therefore, a lot of smart bands and smartwatches are available to keep a tab on a person's sleep data but wearing such devices while sleeping can be uncomfortable for many people. This is where Dozee, which calls itself India's first contactless remote health monitoring device comes into the picture.



Dozee is a "contactless vitals monitoring device" created by Turtle Shell Technologies that aims to provide better access to healthcare needs by providing accurate diagnosis of health conditions of an individual. It consists of a mat that goes under the mattress of the user, a small hub connected to the mat and a power source. The hub can connect to Wi-Fi using the smartphone app for Dozee and keeps uploading user's data to the cloud for real-time analysis. The mat makes use of Ballistocardiography (BCG) technology which is a non-invasive method that tracks vibrations from heartbeats and breathing. It is designed to even track the slightest of body movements to monitor heart rate, respiration rate, oxygen saturation, stress-recovery and sleep stages and these sensors also negate the false positives such as body movements of someone else lying next to the user resulting in more accuracy and reliability.

The device assists in the initial diagnosis of several diseases and thus saves time in deciding whether a visit to the hospital is required. It also reduces the expenses incurred in undergoing multiple tests at the hospital. Since, the device tracks the health condition of an individual consistently, the Dozee app can be installed on one's smartphone to provide a detailed analysis report for the same. The setup for the device is very simple and easy. When the power is turned on, the hub needs to be linked to the Wi-Fi through the Dozee app. Once the connection is done, it remains connected and the user doesn't have to check it every now and then.

The device monitors the heart rate, its range, stress levels and respiration-related statistics. A special feature to note here is that the device doesn't fit the user to a generic average. It is designed to be user-specific. During the first five days of the usage, the device calculates a specific normal for the particular user and then estimates the range. To check this estimation, the device asks for feedback from the user regarding the quality of sleep and then based on the inputs, it alters the estimation. If the user is not feeling good, the device can help in comforting him also, if the user's monitored vitals are within the range. The device also sends a weekly report about the individual's monitored statistics.

As a result of all these factors, Dozee proves to be a great friend for the senior citizens. Their health status can be monitored by their dear ones remotely. They can consult a doctor if signs of any illness show up. The oxygen levels can be monitored for the patients that are suffering from coronavirus and hence, adequate action can be taken on time. This device-Dozee is available to purchase in India at Rs.7,999 which is a worthy investment for those who need a better understanding of their health and fitness.

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Technological Innovations Against Covid-19

As the Covid pandemic accelerates in India, entrepreneurs are setting up more technology innovations to pander to the crisis. As companies look for new techniques to confront the COVID crisis, some plot themes have appeared. Despite mass quarantine, innovations appear almost daily that aim to save lots of lives and support people's well-being within the face of the COVID-19 pandemic.

Here are some ways technology is challenging the novel virus :

❑ AI to help identify COVID treatments

Artificial intelligence accelerates the look for covid treatments. Artificial intelligence (AI) based tools predict drugs/peptides directly from the sequences of infected patients and thereby, they have the next contribution towards vaccine design against COVID-19. European biotechnology company Nuritas is using AI to revolutionize the invention of therapeutic antiviral peptides..

❑ Low-cost quality ventilation

In severe cases, COVID-19 affects the lungs to the extent that patients might need a ventilator to breathe. Several countries face a scarcity of ventilators. This led a gaggle of engineers to innovate a ventilator that uses a car electric motor to automate a resuscitation bag.

❑ Remote hackathon unleashes 42,000 minds on COVID-19

In March 2020, Germany organized a remote Hackathon #WirvsVirus: Hacking to fight the crisis. The event attracted a whole of 42,000 participants. Partakers collaborated on 800 challenges around the virus's impacts.

❑ Telcos to spread public health messages

With the world's second-largest population, India used Telcos to spread public health messages. In March, the department of Telecom asked Telco operators to play a covid awareness message as a caller tune instead of using the standard ringtone.

❑ Contact Tracing Applications

Contact tracing apps like Aarogya Setu have aided in tracking the COVID-19 spread. Aarogya Setu uses contact tracing to record details of all the people you'll need are available contact with. If anybody of them, tests positive for COVID-19, you're immediately notified and proactive medical intervention is arranged for you.

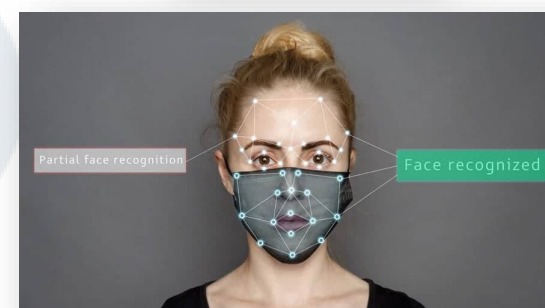
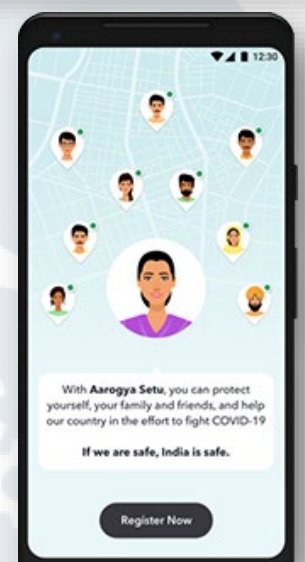
❑ Fitness & Health

As people avoided going out for a walk or visiting gyms during the lockdown, health and fitness apps have come up with new alternatives for people to remain fit while they stay indoors.

Apps like CureFit and Fittr have introduced live workout sessions for users on their apps additionally as on social media platforms to attract health-conscious people.

❑ Tracking people with facial recognition and big data

Big data can help in quickly recognizing infected individuals, connect with them, track who they have are available in grips with, and so on. Such technologies can help in monitoring the movement and tracking of people who are quarantined.



Conclusion

The COVID-19 pandemic is ongoing, while digital technologies offer devices for supporting a virus response, they're doing not provide an on the spot and effective solution. Indeed, technology has improved and might still advance exponentially, but societies must accelerate in adjusting thereto and continue investing in building technology. We should still think creatively for commercial, medical, and social applications of technology as they'll be implemented today and within the long run. crises usually create rapid innovation and improvisation.

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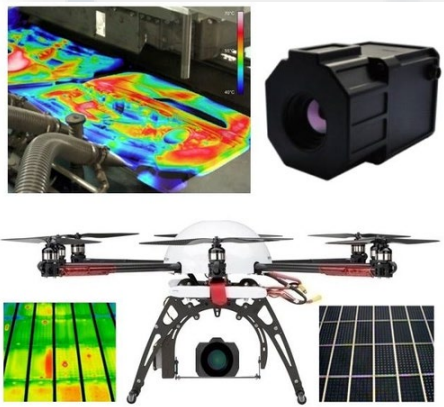
Fighting with such a deadly disease is surely not that easy, so the most important thing during the pandemic was identifying the people between us who have been affected from the disease and were moving freely among us. So here we needed the technology which was sufficient enough to quickly identify the people around us showing any signs of the disease. Therefore over this past year we have seen many improvements in technology which can tell us whether the person have symptoms of the diseases and can even provide us an idea if the person is vulnerable to the disease or not.

First tech in which we have seen some drastic advancements is Thermal Imaging Cameras which is used by Airport Authorities and public places like restaurants are using these thermal imaging equipment to ascertain if a person's body temperature is above the normal range. If the temperature is detected to be high, then the authorities at the airport suggest the person to the medical authorities for further treatments.

Checking so many people becomes difficult with the use of the thermometer so therefore the role of the thermal image sensors comes in so these Thermal screening Cameras are being widely used at airports. Thermal Sensor Cameras have the ability to scan the large scale of people at once.

Living object emits heat and infrared energy. Thermal imaging cameras capture that heat of the body using thermal sensors and then processed with some more of the information which is then shown on computer screens with a varied colour palette. If an image is hotter, it gets easily differentiated from other objects. So once authorities identifies people with abnormal temperature, they send them for further screening.

Many Countries are using Aerial Thermography to detect radiation within the electromagnetic spectrum and produce pictures of that radiation called thermographs. Aerial Thermography uses infrared camera scanning which are affordable and by using gadgets like drones a large area can be covered because of their ability of flying at high altitudes hence the person with the highest body temperature in a crowd can be identified and then treating measures could be taken easily.



Aerial Thermography



Thermal Sensor Camera

We can only control people who are in sight of the Thermal Sensor Cameras but the threat is too big to leave even a single person unchecked, therefore many Mobile Apps have been launched to tackle with COVID-19. Many countries like China and India have introduced different types of apps for the same. For example Indian Government launched Arogya Setu App which have the following features:

- It tells the risk of getting COVID-19 for the user.
- It helps the users identify COVID-19 symptoms and their risk profile.
- It gives updates on local and national COVID-19 cases.
- It allows the users to assess the risk level of their Bluetooth contacts.
- It keeps tracks of your movements and alerts you whenever you come in close proximity.
- With a person who is infected or has signs of having the coronavirus symptoms.
- It is very useful for those people who share the same house or classroom, work closely together and passengers on mass transit where a patient has been present.

Last but not the least we need to be calm during these times. Technology takes time to develop. From AI to robotics, the technology innovations are helping to manage the pandemic, therefore it has a long way to go. But in future it would certainly become better equip to help timely, systematically and calmly if there is an outbreak of a disease like corona virus in the future.

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Fun Facts

- Technologies like remote health monitoring, autonomous disinfection, and contactless temperature guns help slow down the spread of the infection.
- Virtual doctor visits, Chatbots, and online patient engagement tools, along with remote diagnostic solutions, helps reduce the number of people required to visit a hospital.
- To maintain public safety, and public health in general, during an outbreak. Support tools and mobile applications for healthcare workers, using drones to deliver medical supplies, and specialized isolation units help prevent frontline workers from catching the infection.
- Robots are also used in many Chinese hospitals to deliver food, medicine and other supplies to patients; to disinfect hospitals and other public areas; to check patients' temperatures; and to answer common questions.
- Many use artificial intelligence and cloud computing to help organizations process data, giving new insights to help fight the virus.
- Many websites provide free access to their e-learning content.
- Technologies like Augmented reality/Virtual reality becomes digital alternatives, HTC, launched Vive Ecosystem Conference (VEC) using virtual reality in 2020.
- Telehealth proved to be an effective way to contain the spread of COVID-19. The wearable personal IOT devices assisted in tracking vital signs and chat-bots helped in making initial diagnoses based on symptoms that were identified by patients.
- In recent times, robots have been used to disinfect areas and to deliver food to those in quarantine.
- Drones have helped in delivering essential items in the times of pandemic, thus lowering the risk of coronavirus widespread.
- OTT platforms in India witnessed a drastic surge of about 80% in their subscriber base amid lockdown.
- Breaking all underlying records, Indian Prime Minister Narendra Modi's 21-day lockdown announcement was watched by 197 million viewers.
- Many gaming platforms have experienced a significant spike in the substantial growth in gaming sector's sales and the duration for which the games are being played as a vast spectrum of population opted gaming to deal with pandemic stress.
- Technology-based infrared and wireless thermometers are widely used at all public places to monitor body temperature of individuals from a distance.
- A mask with "germ trap" technology was another successful innovation by Manchester bio-chemists in UK.
- In India, contact tracing app known as Aarogya Setu uses GPS and Bluetooth to assist in tracking of the COVID-19 spread.

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