

A Review On Intervention Of Robots In Mitigating Pandemic Covid-19

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Abstract - With the advent of the novel coronavirus, now called COVID-19 (SARS-CoV-2) which is a life-threatening disease worldwide, the focus is on using robots to fight infections, ensuring our families and friends are safe, healthy and do their part to help the community. Computerization plays an important role in supporting the protection of the people and in organizing the resources provided by the people as they move on to further work and study at home. The use of automated techniques will help to combat this spread in a variety of ways such as clinical cleaning robots, man-made shipping to end up socially divisive, and working for self-employment businesses that work for pharmaceutical companies.

keywords - COVID-19, SARS-CoV-2, UV, UVD, WHO.

I. INTRODUCTION

When SARS first appeared in late 2002, it took scientists more than a year to track down the virus. During this time, the Covid-19 type was tracked less than a month after the first case was identified. Similarly, researchers set up the first test to detect the virus soon after the first public declaration of the virus. Veredus Laboratories in Singapore said the company would soon be releasing a “Lab-on-Chip” acquisition kit that detects three types of coronavirus within two hours of being sold commercially [4].

The global war on COVID-19 has seen technology play a vital role in helping people to embrace the spread of the virus and deal with existing crimes. One of the great technologies that has made a huge difference to the ground is robots. Robots have the ability to transmit viruses, deliver medicines and food, measure vital signals, and help control boundaries. As the epidemic escalates, the potential roles of robots become increasingly clear [2]. The world's largest hospital uses robots to help health care workers and patients. For disease prevention, a robot-controlled robot is used because COVID-19 not only spreads from person to person through the respiratory transmission of human beings but also to polluted areas.

1.1 Robots around the world

As Roboticists at Texas A&M University and the Center for Robot-assisted Search and Rescue, have examined more than 120 social media and social media reports from China, the US and 19 other countries on the operation of robots used during the COVID-19 epidemic [1]. Hospitals, doctors and nurses, family members and recipients who work as robots interact in real time with remote patients. Special robots are microscopic rooms and deliver food or instructions, carrying out that extra work that goes into operating with patients. Delivery of robots transports contagious samples to a gym for testing. Ground and air robots play a significant role in almost all aspects of weight control. Outside of hospitals, public works and public safety departments use robots to spray disinfectants in all public spaces. The Drones provided hot images to help identify infected citizens and to emphasize border segregation and community reduction limits. Robots flirt even with crowds, spreading messages of social work through the virus and social isolation.

In Edinberg of the UK, Robotic experts are working on what they say could be the first health care robot that will hold discussions with more than one person at a time [2]. This project is designed to help adults. Experts believe that the outbreak could help in the future to prevent future outbreaks of disease, such as epidemics. Speaking to Bb.com.com, Oliver Lemon, professor of Computer Science at Hinot-Watt University in Edinburg, “You may think the next time you walk into a hospital waiting room, instead of meeting someone you meet a robot who can help you.” .That kind of hands-on, tangible and untouched speech will be much needed. [2]

In the US, COVID-19 patients are being kept in isolated two-bed facilities at Providence Regional Medical Center in Washington. Doctors took the help of a robot, equipped with a microphone, a stethoscope, and a camera. In this way, physicians are able to treat patients without direct contact with them.

In China, the Disinfection Robot UVD has been very important since the epidemic broke out. A large number of hospitals in the country are ordering a Danish-made Blue Ocean Robotic robot. These robots played a key role in controlling the virus in Wuhan, the epicenter of the virus. [2]. Coronavirus tests China's preparedness and response, from public health systems to information sharing. But China has a great opportunity in this war because of its technological infrastructure. As the coronavirus spreads, so do thoughts of fighting it.

Reported Use of Robots (Ground, Aerial) Worldwide for COVID-19 as of 20 April 2020

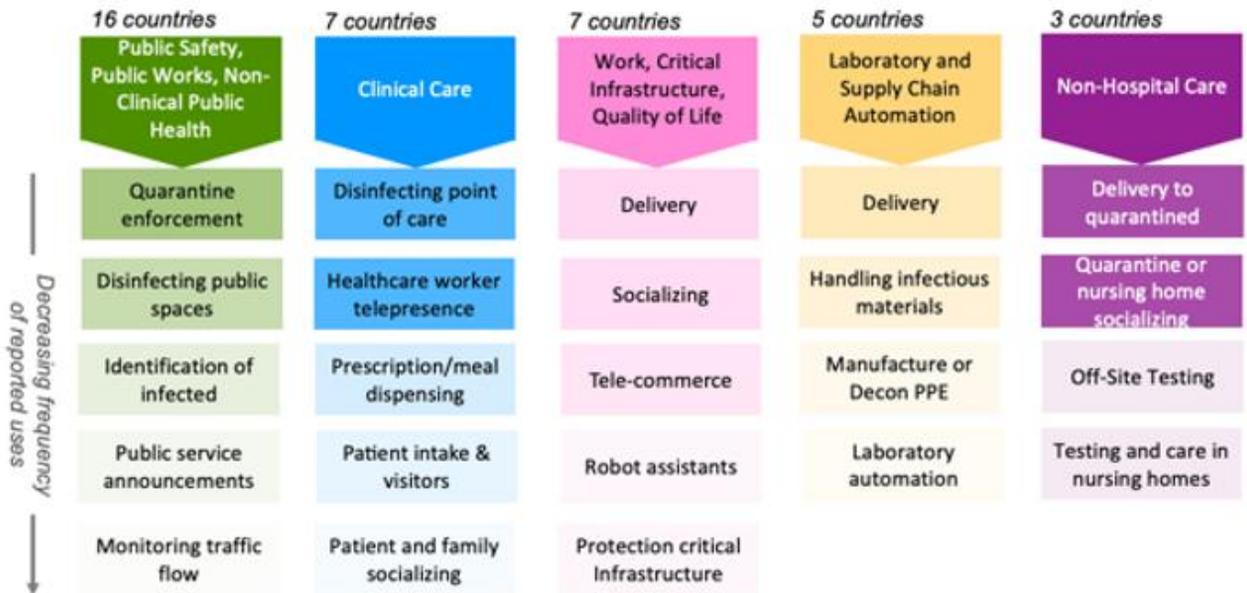


Figure 1: Illustrates Center for Robot-Assisted Search and Rescue, CC BY-ND by R.Murphy, V. Gandudi, Texas A&M; J. Adams. [1]

1.2 Application areas of Robotics development

1.2.1 The Code: In the first few weeks of the virus, China had developed a genome. By sending that method online, it began to have a negative effect on research labs around the world, with a follow-up increase in samples made from the virus to make copies of it earlier. This has allowed new treatments to be recognized - even tests that have failed to provide important information to guide researchers where to focus. [5].

1.2.2 Smart Phones: Smartphones play an important role in reducing display. The apps deliver unlimited deliveries, where drivers unload food at a certain location - including a card that states the temperature of all those involved in cooking and delivering food. Some also provide users with maps to mark residential communities with proven cases and proximity to them. Currently, mobile payment apps limit transfers and paper money, which can carry viruses up to 17 days. With the highest penetration of e-wallets and the world's two leading payrolls, China tech is helping to reduce the spread of coronavirus.

1.2.3 The Skies: Drones are being sent to respond to this outbreak, nationwide. From there you can walk down the streets warning residents to wear a mask, cross the streets and enter QR codes that drivers can access through their phones to register health information; drones allow authorities to extract data quickly while and maintain a safe distance while performing their duties. Agricultural drones also spray disinfectants in remote areas, and some have been used to deliver important medical supplies. Drones used to spray disinfectant on city streets are 5 times more effective than manual spraying.

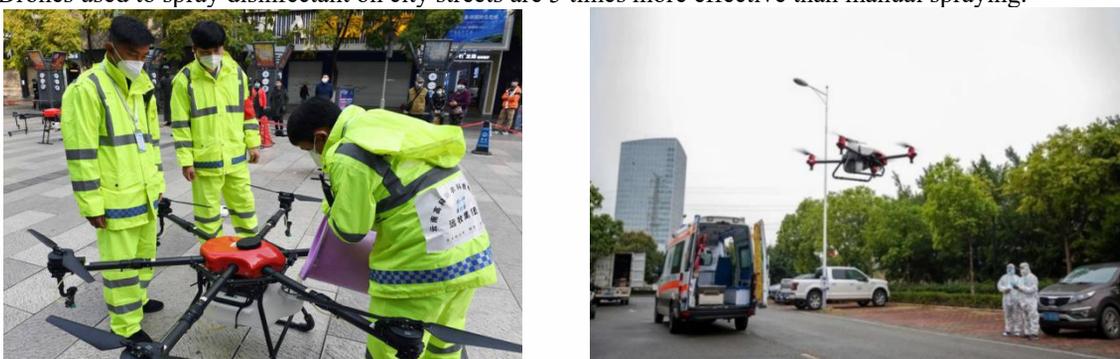


Figure 2: Illustrating Workers in Kunming City, Yunnan Province, China refill a drone with disinfectant. The city is using drones to spray disinfectant in some public areas. Xinhua News Agency/Yang Zongyou via Getty Images [5]

Leading companies in the production of Blue Oceans Robotic are from Denmark. They build, manufacture and sell equipment robots that are primarily used in health care, hospitality, construction and agriculture and their award-winning robot is the UVD robot. The UVD Robot is used as part of a standard cleaning cycle, and aims to prevent and reduce the spread of infectious diseases, viruses, viruses and other micro-organisms living in the environment by reducing their DNA structure. The robot is safe, reliable and eliminates human error. In addition, it is usable and designed for use by daily cleaning staff. These robots are used by China to make contraceptives in hospitals.

The Dimmer Company from Los Angeles also manufactures German UV-C robots for older aircraft, and its UVHammer robotic systems in hospitals and changing environments. This has been used by three major U.S. airports where the plane

landed .In Hong Kong, Hydrogen Peroxide robots are used to perform extensive cleaning and disinfection at train stations and stations to protect passengers and staff.

1.2.4 The Infodemic: As the virus began making headlines around the world, false information also spread, labeled "infodemic" by the WHO. Although technology has made it easier to lie, it also helps to eradicate it. In China, a large integration of Online for professionals, universities, organizations (including UNDP), celebrities and even AI news anchors fighting the epidemic, urging everyone to "spread the word, not the virus." For example, sharing the wearing of a mask, encouraging young people to share the truth with older people and promoting community mobilization.

1.2.5 Business continuity: A major challenge once the virus is operational. Several tech companies offer free online collaboration tools. Some businesses adopt homework policies quickly, using online integration software, affiliate platforms and LBS technologies to access and ensure employees stay home. At UNDP, the use of Zoom teleconferencing and ERP Platforms has allowed us to continue working.

1.2.6 Education and parent’s sanity: Within weeks of the opening of schools, a major challenge for parents is to keep children busy and active. To allow for this, many Chinese schools have established online learning platforms, where students take classes and teachers give lectures at home, via live streaming platforms.

1.2.7 E-Medical and psychological care: From hypertension to orthopedics, people still have many other medical needs. Doctors on the Internet and the sound delivery of drugs are on the rise, as people avoid hospitals. Many institutions offer online counseling services - often free of charge - to deal with social pressure. These types of robots perform a number of important functions, including marking patients at the entrance of a district hospital that showed flu-like symptoms, monitoring heart disease and blood oxygen levels, delivering medicine and leading diagnostic procedures for sick patients. These robots are used by China in Wuhan Hospital to provide working nurses with something. The arm of the robots on the wheel was used to perform tasks such as ultrasound, to take sweets, and to listen to sounds made by the patient's limbs, which are usually performed with a stethoscope without the need for medical personnel in one room.



Figure 3: Illustrates how the robot uses pulses of ultraviolet light to disinfect a hospital room in Johannesburg, South Africa. MICHELE SPATARI/AFP via Getty Images[5]

A small number of independent robots, such as the famous UVD decontamination robots and the doctor's carrot. But reports indicate that robots are not a place for workers to flee. Instead, robots are assisting existing hospital staff to deal with the operation of uninfected patients. Decontamination robots kill germs better and faster than human cleaners, while vehicles reduce the amount of time and personal protective equipment and nurses and assistants have to use support services.

1.2.8 Robot nurses and AI Diagnoses: Robots are also used in many Chinese hospitals to deliver food, medicine and other supplies to patients; disinfection of hospitals and other public places; monitoring patient temperature; and answering common questions. Coronavirus is detected using AI, which can read thousands of CT scans in 20 seconds with accuracy rate of 96%. Robots used in Wuhan hospitals to help patients with questions, reduce the risk of contamination.



Figure 4: Illustrates how Robots are being used in hospitals[5]

Applications such as Zoom, Microsoft Teams are widely used during this closing period but the telepresence robot also reports high interest rates. They work where attendees need to turn around. Ava Robotic developed these types of robots and due to the current outbreak of coronavirus these are needed in hospitals as they give family members the opportunity to talk to patients and elderly residents about video due to “no-visitor” policies and closures in these areas. One of the largest hospitals in Boston is playing a robot to screen patients away from robots as part of the first consultation, he said. The hospital also considers using robots in cases where doctors are required to enter and leave the room regularly - instead of the person doing so, the robot can save the hospital from objects where the doctor needs to wear a face mask and gloves at any time.

1.2.8.1 Privacy and use of AI to track infections

As institutions rush to develop new ways to track people infected with COVID-19, 31% of respondents said they were more willing to share personal information, and 22% of Americans were less willing. In addition, 47% of respondents said that their willingness to share that information has not changed, with 25% already willing to do so and 22% willing. Personal data collected from Smartphones and Web applications can be used to train machine learning techniques that display high-quality patterns and methods. AI is learning from data sets, and now, there is a lot of interesting discussion about how AI informed about personal data can help in the coronavirus response, such as quickly identifying a potential vaccine. [7].

1.2.9 Big Data dashboards: The clarity and accessibility of public information has helped the development of dashboards to track viral transmission. Currently the rotation of these dashboards is not done by UN agencies such as WHO, but also by organizations and small businesses that provide for their needs. Users can easily access these real-time updates with their familiar programs. While the use of technology can sometimes present its own challenges, and there will be fuel disputes over privacy and well-being; in the fight against coronavirus, it plays an important role in providing treatment, information, support, nutrition, schooling and greater safety for many.

1.2.10 Random automatic vehicles: Self-powered remote drivers are used by Wuhan to deliver food and other necessities to households. The demand for these vehicles is increasing in popularity as more people buy things online as they live at home with the disease. Robots are used to prepare and serve food in restaurants. This concept is known as black kitchens. In the current situation where many restaurants are closed around the world, there is a sudden increase in black kitchens in many countries. Many companies around the world have developed robots that help prepare meals including Miso Robotic (hamburger grill and deep frying), CafeX (coffee and other beverages), and Picnic (pizza preparation). it has become clear that robotic technology and automation will be needed as humans and robots interact. [3]



Figure 5: Illustrates usage of robots as contactless options in agriculture [6] and at grocery stores. [7]

There are also many recent times when machines have helped people to do their jobs. Bombing robots, for example, serve as remote military bases equipped with weapons to disable suspects.

2. Robots in future pandemics

It is hoped that COVID-19 will accelerate the adoption of existing robots and their adaptation to new niches, but may also lead to new robots. Laboratory and automation chaination emerges as an overlooked opportunity. Installing a slow-moving COVID-19 test system based on a small set of labs and trained staff can eliminate some of the current delays in many parts of US Automation is not particularly exciting, but it is similar to the current robot disinfecting robot, a useful application. Once the government and industry have finally learned from these past catastrophes, the extraordinary robots will be ready to work with health care workers on the front line when the next epidemic arrives.

3. Success stories

3.1 Robots installed in Chinese hospitals use three models from Orbbec's Astra 3D camera: the Astra, Astra Mini, and the Astra Mini S [9] provided.

All three cameras have RGB with a resolution resolution of 640 x 480 image, which works at 30 fps. Cameras also require less than 2.4 W and can operate on built-in platforms such as single-board computers, making cameras ready to be sent to robots. Orbbec 3D Sensor (Troy, MI, USA.; www.orbbec3d.com) for years has been appreciating the value of 3D sensitivity in the medical community through applications such as fall detection and patient monitoring, physician or nurse awareness when a patient needs help. According to David Chen, founder of Orbbec, thousands of these cameras, which are installed in hospitals across the United States, "could reduce the risk of injury to the elderly by a fall of more than 50%."



Figure 6: Orbbec's four basic models of its Astra series 3D camera, with some model-specific variations, and the Persee-model camera (back left).

Astra technology is a series of art, optical formats, an in-depth calculation algorithm (based on open source codes), integrated application-specific circuits, and software all developed by the manufacturer. Cameras offer two different options, according to Chen: standard RGB camera functions for monitoring and 2D algorithms for tracking and recognition, and full field details without the need to capture or highlight a point. All Orbbec cameras also support Android, Linux, and Windows systems, which are very important in China where manufacturers of robots often use Android operating systems robots instead of Linux or Windows platforms, said C Chen. While the company releases the flexibility of its cameras into a wide range of applications, the use of hospital robots presents some challenges such as the limited viewing field (FoV). Avoidance algorithms prevent high performance with a wide range of FoV and solid areas in many hospitals block FoV on a large scale. Most Orbbec cameras have a 70 ° diagonal FoV. The company is currently developing a new optical design with 110 diagonals, in part to deal with conditions such as hospitalization. [9].

The durability of the camera creates another challenge. Most 3D cameras can operate continuously for up to a year, says C Chen. Orbbec is working to increase camera life and resilience in critical situations, with the company's vision including hospital application.

3.2 Bengaluru hospital introduces robots to screen people to protect doctors from being infected. [8]

At Fortis Hospital in Bengaluru, Karnataka, robots are now doing their first diagnostic work, previously performed by doctors. The Mitra and Mitri robots tested people who came to the hospital for a Covid-19s test. The work of Mitra's robot is simple. Asking 5 questions - your name and phone number. It also takes a person's body temperature and asks if the person has the flu. After that, it will ask the person if he or she is patient. If you are satisfied with all the details, it will send that person to meet the person when they receive it. However, if that person is to blame for Covid-19 problems, that will direct him to the Myriotic robots. Second robotic screens with Covid-19 symptoms and flu-like symptoms, arrange a video call with the doctor and give the patient a visit to the doctor. Dr (Wing Commander) Nagasubramaniam, Medical Director, Fortis Hospital, Bannerghatta Road said the hospital had taken this step to ensure that health workers were protected in the first place.

Conclusion

In changing times, like other technologies, robots also play an important role in fighting infections such as COVID-19. In the event of an outbreak of violence, robotic technology could play a key role in not only helping patients but also keeping doctors and health workers safe.

"Opportunities lie in smart navigation and the detection of high-risk, high-impact areas, combined with other prevention strategies," said investigators. "New generations of robots, small, small, and ski robots can continue to operate and clean (e.g., according to telepresence," the deployment of social robots could bring unique opportunities for continued social cohesion and adherence to treatment without fear of transmitting many diseases, "wrote the researchers. This is a challenging developmental area because social networking requires the formation and maintenance of complex human species, including knowledge, beliefs, emotions, and the context and environment of communication. "

COVID-19 may be a place to show how future organizations work. Instead of canceling major exhibitions and conferences around the world, new ways of gathering - more visible than the actual people - could be on the rise. Attendees at meetings may be accustomed to distant involvement in the use of various home avatars and controls. "Overall, the impact of COVID-19 could further advance research into robots to address the risk of infectious diseases," researchers continue. Except for a stable situation. method of research and testing, history will repeat itself, and technology robots will not be ready to help in the next incident. "

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