



Drone Technology for Assisting COVID-19 Victims in Remote Areas: Opportunity and Challenges

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The devastating effects of the COVID-19 have been observed all over the world. The consequences of this novel coronavirus on different facets of life have been explicitly recognized. It has shattered hotel, tourism, entertainment, transportation, and the healthcare industry. Despite, urban and city areas the people living in the rural areas are also greatly affected by this global epidemic. The sharp pangs of this pandemic are adversely affecting the lives of the people living in remote areas due to ignorance and carelessness [1, 2]. Moreover, the scarcity of high standard hospitals and medical facilities in rural areas is a serious concern.

Several smart and artificial intelligence-based solutions for diagnosis, prediction and remote monitoring of the COVID-19 patients have been already proposed. The existing literature witnessed the use of distinct emerging techniques like soft computing, fog computing, wearable devices, augmented intelligence, social internet of things, machine, deep and transfer learning techniques in coping with this pandemic [3–6].

A drone is an "Unmanned Aerial Vehicles" (UAVs) also refers to an unpiloted aircraft that assist in transmitting a different kind of products from one place to another. There are two basic categories of these robotic tools called basic and advanced UAVs. The operation and movement of simple robotic UAVs can be remotely controlled (by a human), while the advanced UAVs solely depend on sensors and LIDAR detectors [7].

The use of drone in healthcare has been widely cited. However, this pandemic offers a real opportunity to use these robotic UAVs for providing healthcare support to the COVID-19 victims. The contactless delivery from drones

found to be more effective to break the chain of this global epidemic infection. These drones have the potential to provide healthcare support by quickly and efficiently transporting the medicines, injections, and COVID-19 vaccination to remote areas. The on-time support of vaccination and medication can help in reducing the number of infections and save masses of human lives.

The key benefits of using a drone in providing support to COVID-19 victims in remote areas include a decline in the rate of COVID-19 afflicted or infected victims in the hospitals/clinics and, as a result the waiting time has been significantly reduced. The UAV services are more beneficial in remote locations with little or poor transportation infrastructure [8]. In case of strict lockdown or curfew, the drone can also be utilized for providing food and other essential products to the most afflicted COVID-19 zones. The camera implanted on the UAVs may also facilitate monitoring the real-time picture of lockdown and curfew enforced in various parts of the country. It can also be used as a surveillance tool for quarantined victims. These robotic tools will also be beneficial in spying or monitoring cinema halls, marriage palaces and other crowded areas to enforce strict social distancing rule governed by the government. In case of any violation, the needful action can be taken by the government.

However, several challenges lie in the implementation of this contactless delivery of healthcare products using UAVs. Firstly, the laws related to the use of this robotic tool are not crystal clear. The social impact i.e. people feel worried that the extensive use of these robotic tools will harm the labour market, as the transportation of the products does not require manpower. Technical constraints like the number, weight of the product and weather conditions are still a challenge for the drone industry. Moreover, the extensive use of drones may also pose a profound threat to civil aviation. The ability of a drone to capture the images or videos of persons, public and government properties may create a safety and privacy concern for the same [9].

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