Pandemic Turns Surveillance Systems into Healthcare Sentinels

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A pandemic is not only a public health issue but a scenario that has far-reaching security implications. Flow management in crowded spaces, urban surveillance, and monitoring quarantine areas are some of the complex tasks conducted by authorities to maintain public health and security. Israel's leading defense industries have adapted their technological solutions to meet public health officials and law enforcement authorities' vast needs during this pandemic. The following will introduce some of these solutions.

The surveillance of vast areas relying on earth observation satellites is perfectly designed to support crisis management on a national and local scale. Changes in landscape, population movement, and people's concentration can be detected and monitored by remote sensing from space. ImageSat International NV (ISI) provides high-resolution commercial satellite earth-imagery, serving the national defense, intelligence, homeland security agencies, civil authorities, and commercial users.

As an Israeli space company and a strategic vendor to the Israeli Ministry of Defense, ISI owns and operates a highly maneuverable and ultra-resolution satellite "EROS-NG constellation." On top of its proprietary constellation, ISI enables access to additional Electro-Optic and Synthetic-aperture radar (SAR) Satellites. ISI Satellite can be used for monitoring specific COVID - 19 related areas of interest and assist with the management of such crises. For example, such imagery can be used for the evaluation of crowded activities by monitoring and analyzing the volume of vehicle movements on roads and waterways, or monitoring vehicle presence in car parks and trucks in logistics areas during commercial activities, or to monitor the effectiveness of mobility limitations between cities and counties.

Closer to the ground, video surveillance systems are essential sensing devices available to authorities to monitor and manage traffic flow and the movement of people and vehicles. But with new conditions unfolding, cameras may be required at new locations or placed in

high vantage points to improve coverage of critical areas. While drones can provide a quick solution for a temporary situation, aerostat-borne means of surveillance are employed for continuous coverage of key locations. RT LTA Systems - Provides such aerostats for military, security, and law enforcement agencies in Israel and abroad. Their Skystar aerostat allows safe operations in winds exceeding 40 knots at altitudes of up to 1,500 feet. Operated by three personnel, the system is launched and recovered within 30 minutes. Once deployed, a single person is needed to monitor and manage the system. Skystar carries a stabilized optical sensor suite, delivering high-resolution imagery in day and night. The omnidirectional payload uses powerful zoom and video recording features.

Shilat Optronics - offers the Micro Tactical Observation Aerostats that has been widely used for crowds monitoring in the Tel-Aviv area during the curfew imposed at different municipalities suffering coronavirus outbreaks. Shilat developed unique payloads for these balloons, employing a patented electro-optical concept that enables high-quality aerial imaging that can spot a human from a distance of up to five kilometers. The system rapidly deploys from small vehicles, ascending 800m above the ground in minutes. Sensor data is transmitted to the ground through the tether by a secured fiber-optic line.

Seraphim - Sometimes, you must get closer to your subject to gather the information and intelligence you need. Protection of borders and national infrastructures, such as airports, oil & gas, nuclear power, and water plants, becomes critical during emergencies. Covert sensors become useful for these missions. One such sensor is the Firefly from Seraphim. It is a small and lightweight ground-based multi-sensor which uses radar and seismic sensors to trigger integral video and thermal camera. Firefly monitors and reports on activities and movements surrounding it, using video analysis algorithms to detect and classify targets and employing sensor fusion to reduce false alarms.

The new reality of pandemics necessitates monitoring people's health state entering crowded places, thus preventing those who are infected and have symptoms from spreading the virus in the community. Temperature measurement is a standard method to spot coronavirus symptoms. Thermal cameras enable taking such measurements from a distance.

SCD - Semi Conductor Devices (SCD), has recently started the development of a video engine sensor - termed VOXI – positioned as a highly sensitive IR sensor with integrated processing abilities, enabling remote and automatic temperature monitoring in various environments. VOXI will be able to remotely monitor physiological parameters, assisting medical personnel in their diagnostic process. It will be able to operate at crowded sites, scanning vitals for health hazards, at train stations, shopping centers, office buildings, or amusement-parks. The system's development is a combined effort led by the Israeli Ministry of Defense (IMOD) Directorate of Defense Research and Development (DDR&D) and the Israel Defense Forces (IDF) Technology Unit with the participation of several Israeli Industries.

Opgal - Opgal Optronics Industries has been developing thermal cameras for nearly 40 years. In 2003, Opgal was among the first companies to develop Thermometric cameras for human body temperature screening in the SARS crisis. Opgal offers ThermApp MD and ThermApp MD PRO, enabling people's screening by detecting elevated body Temperature in large groups of people in less than a second. These thermal cameras are provided with a Software Developer Kit (SDK), enabling customers to design their solutions.

Corsight – Combined with existing surveillance equipment, Fortify Thermal Camera Integration helps identify these individuals with high body temperature within a crowd monitored by video cameras and prevent them from entering the protected facility. The system registers the identified targets' mathematical signature and prevents them from re-entering the premises until they are healthy and no longer pose a health hazard. The system records the face of those individuals in a time-lapse database, and over the next 24 - 48 hours, they will prevent their access, even if they display body temperature at a normal range. Once the preset time has elapsed, the database is updated, and the individual can enter the premises once again. Through the routine scanning, the system does not capture images, and faces are blurred to maintain privacy. The only images captured are those individuals with a high body temperature who may pose a health risk to others. The system stores the mathematical signature representing their face, thus avoiding the possibility of recreation of face photos.

Troya - Troya's TVC-2020 skin temperature measurement system uses AI-based analysis to screen a large number of people in high-density crowded environments. The system performs screening of crowds in real-time without direct contact with the tested objectives. Once detecting a potential contagious subject, TVC-2020 signals the operator with a visual and audial cue and starts tracking the subject, allowing security guards to separate that individual from the crowd.

IAI Elta Systems - has developed an indoor surveillance system called TAMAR that remotely and instantly tests human life signs such as body temperature, heartbeat, and respiratory rates. The system uses a commercial radar operating at a very-low-power level, coupled with a high-performance thermal camera, into an application that uses AI to analyze the combined sensor data.

Operating as a closed automatic system requiring no human intervention, TAMAR detects, with a very high level of accuracy, individuals that may be infected with respiratory-based viruses or other related illnesses. Operated at a distance from the subject, the system quickly and reliably determines whether a risk is posed, displaying a pass/fail green or a red alert following predetermined thresholds. The display of additional physiological parameters is also available to the operator, such as the temperature of different body parts (hand, forehead, nose, and mouth), heart, and respiratory rates.

Leveraging the extraordinary capabilities of Israel's defense industries, the International Defense Cooperation Directorate in Israel's Ministry of Defense (SIBAT) provides the gateway for foreign governments and enterprises seeking solutions to address the most pressing challenges posed by the pandemic. SIBAT remains updated about technologies and solutions being developed by Israeli defense industries, both large companies and small or medium enterprises (SME). These new capabilities are adapted to meet the evolving needs and operational requirements expressed by SIBAT's partners in Israel and abroad.

For more information, please contact SIBAT to download our latest report:
Israel's Solutions for Pandemic Challenges