Robotics
COVID-19
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COVID-19

No vaccine has been developed to date for any of the seven coronaviruses known to infect people.

Scientists expect that these types of outbreaks will occur for the foreseeable future in irregular intervals.

COVID-19 spreads mainly among people who are in close contact (within about 6 feet) for a prolonged period. Spread happens when an infected person coughs, sneezes, or talks, and droplets from their mouth or nose are launched into the air and land in the mouths or noses of people nearby. The droplets can also be inhaled into the lungs. Recent studies indicate that people who are infected but do not have symptoms likely also play a role in the spread of COVID-19.

According to the CDC, social distancing is one of the best tools we have to avoid being exposed to this virus and slow its spread.

As the coronavirus has spread, robots are having the "put me in coach" moment they’ve been waiting for.
Meat Processing
When 293 people were diagnosed with COVID-19 at the Smithfield Pork Plant in Virginia, they closed down operations. This closure and others have created concern about disruptions in the food supply chain.

Plants like Smithfield employ thousands of people working side by side carving meat, making social distancing nearly impossible. The plants were constructed to make that possible, and the physical space cannot be readily reconfigured.

A solution may be found with robotics.

New Zealand based Scott Technology has been developing fully automated meat processing robots for a couple of years now, and those robots are getting exceptionally good at extracting different cuts from lamb, pig, and beef carcasses. In one of Scott Technology’s “lamb boning rooms,” a production line of about a dozen robots strips meat from 600 carcasses an hour. Automated arms clamp onto pieces of raw lamb, while others wield guillotine style blades or small knives to cut through them.

The world’s largest meat producer, JBS, have invested in Scott’s technology and are working with them to bring it to the US market. The robots work together to form an assembly line, with each one performing one step in the process. Unlike most machines, which use a pre-programmed carcass outline, Scott’s robots look at the shape of each individual carcass and make specific cuts accordingly. The technology’s algorithms then leverage deep learning, which allows the robots to become smarter over time as they collect data about the carcasses they encounter.

Prior to the pandemic, Tyson began investing in automation and robotics to alleviate a worker shortage that has been an ongoing issue for the industry. At the 26,000 square foot Tyson Manufacturing Automation Center engineers apply advances in machine learning to meat manufacturing. The original goal was to eliminate jobs that are physically demanding, repetitive, dangerous and difficult to fill. A shortage of labor has been one of the biggest obstacles to growth in the industry. In the current context the industry may have no choice but to expedite deployment of automated workers.
The Restaurant Industry

Industry analysts estimate a 25% reduction in restaurants this year and a focus on a touch-less customer experience. Surveys indicate that a restaurant’s cleanliness and food safety are priorities for patrons.

Refraction AI’s robot restaurant food delivery service has seen a four fold increase in demand since the shut down and the company’s engineers are working around the clock to expand the company’s fleet of three-wheeled REV ‘bots. The robots are wiped down between every delivery; upon food delivery, customers can open the 5-foot tall robot’s door by phone instead of keypad; and the company has installed UV lights — a coronavirus killer — in the interior to disinfect the compartment and food.

“People who run restaurants aren’t sure they can come through this,” said the Refraction CEO. “The fear that 25-to-50% (of) restaurants will go away is terrifying to me. And the jobs from dishwashers to bus people to caterers to line cooks _ their livelihoods depend on their customers. If (the COVID crisis) goes on for six months _ with one wave after another _ we have to come up with a sustainable way to do this.”

Miso’s Flippy robot uses proprietary machine learning and robotics control software to prepare fried and grilled foods. It has served more than 12,000 hamburgers to date, and the company’s goal is to improve consistency, productivity, and sanitation while improving the dining experience.

“Miso Robotics, which was incubated at Cali Burger, is trying to find the best way to address the problem from a food-safety standpoint,” said Buck Jordan, CEO of Miso Robotics. “Because the virus is persistent and sticks to objects, it’s better to have minimal to no humans in the loop to keep restaurants safe.

“This moment is a call to arms for robotics makers to really bring their technology to market that helps people. Particularly now in a time when there are so few options for doing tasks that we don’t want to put people at risk for,” said Refraction AI CEO Matthew Johnson-Roberson, an associate professor of engineering at the University of Michigan with 20 years of experience in the robotics field.
The Delivery Industry

Human to human contact is canceled, but people still need food, medication, and other essential items. Delivery companies are plugging the gap, but not without risk to their employees and contracted gig workers.

In Houston, NURO delivers groceries autonomously in partnership with Kroger. It recently received the federal approval to deploy 5,000 of its R2 vehicles.

Nuro is also delivering medical supplies to two California stadiums that have been converted into treatment facilities for COVID-19 victims. One of Nuro’s vehicles is operating inside the Sleep Train Arena, making deliveries to workers at either end of the facility. “The transport that we’re doing reduces the amount of transport that otherwise would need to be done by the healthcare staff,” Ferguson said. “This is where all the COVID patients are, so this is effectively a very high risk exposure area.”

TuSimple's autonomous trucks are running commercial cargo trips in Arizona, New Mexico, and western Texas. The startup is providing pro bono services to the Arizona Food Bank and has over 18 commercial partners, including UPS and USPS.

Small, electric autonomous NAYVA shuttles are being used to ferry COVID-19 tests and medical supplies from a drive-through testing center at the Mayo Clinic in Jacksonville, Fla. What’s more is that the half-mile trip is made without a human operator on board. “With no operator, it frees the Mayo clinic staff to do their work and serve patients,” said David Cawton II, communications director for the Jacksonville Transportation Authority (JTA), a partner on the project. “Additionally, with the need to social distance the shuttle limits human-to-human interaction.”
The Sanitation Industry

The Coronavirus outbreak has highlighted use cases for mobile robotics to successfully disinfect, monitor, survey, and handle and deliver materials. US-based Germ Falcon is offering a UV disinfection solution for aircraft, while Chinese TMiRob is deploying disinfection robots in Wuhan. According to news reports, working hours for cleaners have doubled to 16 hours a day due to the manpower crunch.

In San Antonio, Texas, Xenex, another leading provider of UV-lightzapping germicidal robots, has shipped hundreds of their LightStrike bots around the world, including to nearly 70 Veterans Administration hospitals in the U.S. and to ten sites run by the U.S. Department of Defense. LightStrike robots use pulsed xenon light to disinfect different hospital areas. Xenex's patented pulsed xenon Full Spectrum UV room disinfection system eliminates harmful bacteria, viruses, and spores. The system is capable of killing C. diff, MRSA, VRE, and other multi-drug resistant organisms in a shorter time than other UV light devices.

Danish company UVD Robots is scaling up deployments to disinfect hospitals. It takes between 10 and 15 minutes to disinfect a typical room, with the robot spending 1 or 2 minutes in five or six different positions around the room to maximize the number of surfaces that it disinfects. The robot’s UV array emits 20 joules per square meter per second (at 1 meter distance) of 254-nanometer light, which will utterly wreck 99.99 percent of germs in just a few minutes without the robot having to do anything more complicated than just sit there. The process is more consistent than a human cleaning since the robot follows the same path each time, and its autonomy means that human staff can be freed up to do more interesting tasks, like interacting with patients.

The tech market advisory firm, ABI Research, expects the overall mobile robotics market to grow to $23 billion by 2021. “Crises shift perceptions on what is possible regarding investment and transformative action on the part of both private and government actors,” said Rian Whitton, senior analyst at ABI Research. “By the time the COVID-19 pandemic has passed, robots will be mainstreamed across a range of applications and markets,” he said. For mobile robotics vendors and software companies targeting more nascent markets, this represents a big chance to highlight the importance of robotics for dealing with national emergencies, as well as mitigating the economic shock.”