MyAdvantech

Special Edition 2020–2021

Fighting COVID-19 with IIoT and Smart Solutions

CORPORATE CITIZENSHIP

Fighting COVID-19 with Altruism, Advantech Employees are Connected by Common Goals

COVID-19 APPLICATIONS

Co-Creation of Industrial IoT Applications in Fight Against COVID-19

EXECUTIVE TALKS

After the Pandemic, a Positive Future Awaits

ADVANTECH

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Published by
Advantech Co., Ltd.

Publisher
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Edit Production
Hdero Integrated Marketing Co., Ltd.

Initial Issue 2007.09.15

Facing the COVID-19 Pandemic: Technology Offers a Protective Umbrella for Public Health and Well-Being

Since the COVID-19 outbreak in January 2020, the pandemic has swept like a tornado throughout Asia, affecting China, South Korea, Japan, and Singapore, before moving on to Italy, Spain, Germany, and France. In the blink of an eye, the U.S., India, Russia, and many countries in the Middle East were also overwhelmed. To date, the number of coronavirus cases globally has reached more than 6 million. Moreover, the rapidly increasing number of infected patients has brought healthcare systems in many countries to the edge of breakdown, and caused shortages of medical masks, protective gowns, breathing aids, X-ray machines, and CT scanners. More than 300,000 people worldwide have died because of COVID-19, with thousands of lives being lost every day.

Faced with a threat greater than war, every country in the world needs to cooperate with one another to stop the spread of the virus and develop vaccines or cures as soon as possible. As a leading industrial IoT solution supplier with a wide global network as well as years of experience developing innovative solutions, Advantech has been able to quickly mobilize its global resources to help system integrators and software development partners worldwide.

Additionally, Advantech has invested in co-creating intelligent solutions that utilize its powerful hardware, AIoT solutions, cloud computing, and other cutting-edge technologies to fight against COVID-19, developing dozens of intelligent applications in just a few months.

In order to promote the deployment of virus fighting technology, Advantech is publishing this MyAdvantech Special Pandemic Edition–Together, Let's Fight COVID-19. Inside there are 9 case studies from Europe, the U.S., and Asia that showcase how intelligent technology can be used to protect public health and well-being.

The purpose of this edition is to introduce various technologies that can assist health officials and hospitals around the world accelerate the digitalization of efforts to fight against this pandemic.

Whether it's helping Softgent develop its Flexgent IoT solution for real-time patient monitoring, assisting public health authorities with building safe and reliable 24/7 quarantine solutions, or collaborating with Nanjing Pride Technology to transform production lines to increase the manufacture of face masks and medical materials, Advantech's global teams have played a proactive role on the front lines of the fight against COVID-19.

Although the pandemic may have brought about a dramatic shift in life as we know it, it has also given us a chance to re-think the future. Advantech stands firmly behind business philosophies that emphasize the importance of mutual health and well-being. We will work hand-in-hand with global partners and invest our efforts into developing new innovations and intelligent IoT solutions that can assist in the fight against COVID-19 while also ushering in a new era of innovation.■

The Three Arrows of Advantech's Business Strategy in Response to COVID-19 Challenges

Interview with Eric Chen, President of General Management, Advantech

Since the coronavirus outbreak, Eric Chen, Advantech's President of General Management has witnessed the dramatic impact the pandemic has brought to global operations. In response, he initiated three proactive strategies to encourage Advantech's global employees, customers, and partners to keep faith and fight the pandemic together.

First arrow: information transparency

"In times of danger, information transparency is the best solution to reassure the public," Chen stated. As soon as the coronavirus outbreak started in China, sales teams received customer queries asking if product development would be completed on time. Soon after, Chen decided to use an online platform to provide timely updates to customers and partners regarding Advantech's manufacturing capacity and employees' health status. The result of this information transparency strategy was promising. Internally, Chen wrote an open letter to all employees to launch work-from-home and flexible working hours policies to safeguard employees' health and safety and maintain information transparency and sharing with the use of appropriate IT tools.

Second arrow: financial stabilization

The pandemic has drastically affected the financial prospects of almost all businesses and companies around the world. Thus, Advantech not only reviewed their financial situation and maintained sufficient cash flow, but also considered the impact on suppliers and customers and adapted solutions to overcome any obstacles. Chen said, "For instance, because the situation in India is severe and having a dramatic impact on our customers, we offered reasonable payment deferment times; and for our suppliers, we retained a 60-day open-account term as standard."

Third arrow: digital optimization

The COVID-19 pandemic has accelerated digital optimization or transformation in enterprises. Internally, Advantech activated a work-from-home policy. Externally, in order to meet online purchasing trends sparked by the outbreak, Advantech strengthened the promotion of its industrial automation hardware and software sales packages already provided on IoT Mart, by conducting proactive online presentations demonstrating the advantages of these packages.

Chen emphasized that the pandemic would pass eventually. During these tests that challenge humanity and business sustainability, Advantech puts employee health first.

Under this principle, we identified the best responses to the pandemic risks, considered whether to overhaul or adjust the way we conduct sales and marketing activities, and established innovative directions for moving forward in a post COVID-19 world.

Lastly Chen said, "We have no idea where the world will end up after this pandemic, but we can cherish and live in the moment, so let's pursue our dreams and work hard with courage."■

After the Pandemic, a Positive Future Awaits

Interview with Chaney Ho, Co-founder and Director of the Board, Advantech

Chaney Ho, co-founder and director of the board of Advantech, firmly believes in the maxim, "Tough times never last, but tough people do." While Advantech faces challenges in the wake of the COVID-19 pandemic, Chaney Ho and Advantech are addressing the crisis by seeking ways to make a difference though the application of smart technology. Through effective management, they hope to re-direct Advantech to the greater good of everyone.

Defeating COVID-19 with humanity and care

According to Chaney Ho, when markets are stable, companies can use transactional leadership to achieve operational goals with the help of key performance indicators (KPIs). However, during periods of crisis, companies should adopt transformational leadership to give employees a sense of security and stability. Using people-centric (rather than organization-centric) thinking and management assures employees of the competence of their employers. At the onset of the COVID-19 outbreak, Eric Chen, president of general management, sent an email to all Advantech employees explaining the company's operational status. The email transparently addressed the issue, which assuaged employees' fear and anxiety. Chen also assured employees that the impact of the pandemic, while present, remained fairly limited.

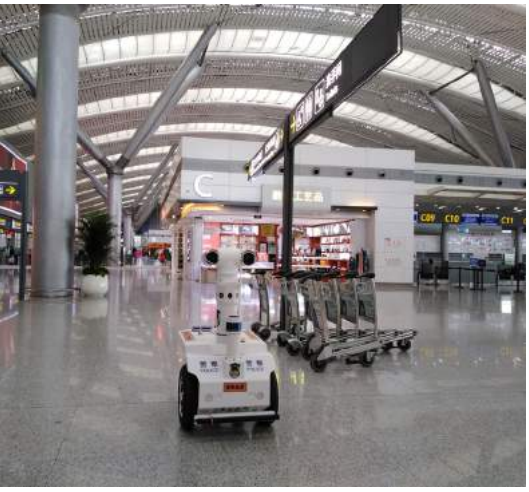
Identifying new opportunities with a forward-looking approach

Chaney recently stated, "Drastic changes in the macro-environment often provide new opportunities and this has proven true for the COVID-19 pandemic as well." After the initial outbreak, Advantech immediately held a forward-looking conference to explore post-pandemic possibilities and identify business opportunities. Chaney predicts the current pandemic will cause drastic changes in four major areas—global supply chains, market demands, work methodology, and lifestyle.

The introduction of regional and national lockdowns has disrupted supply chains and necessitated rapid change. Indeed, the antecedent rules of globalization are being rewritten. Industrial production previously concentrated in China will be shifted to Vietnam, Malaysia, Thailand, the Philippines, India, Mexico, and several European countries. Additionally, companies are set to establish decentralized regional hubs in preparation for the possibility of future large-scale lockdowns.Social distancing policies have increased demand for telemedicine, work-from-home systems, online business support, and automated unmanned delivery vehicles (such as drones). Many people are attempting to work from home using software such as Microsoft Teams, Zoom, or Skype to communicate with colleagues and customers. Consequently, the use of food delivery services such as Uber Eats and Foodpanda has also increased. In summation, recent circumstances are yielding dramatic changes in people's personal and professional lives.

Chaney further added, "Fear stems from uncertainty. If people know what they can do to control the situation, their fear will decrease significantly." To this end, Advantech has focused on people-centric management and adopted a forward-looking approach to formulate a pragmatic strategy for stabilizing company operations and creating new business models. Advantech's ultimate aim is to open new avenues for growth in the post-pandemic world.■

Co-Creation of Industrial IoT Applications in Fight Against COVID-19



Technology will play an important role in the fight against COVID-19. Increasing the production of personal protective equipment (PPE), enforcing social distancing, and rapidly developing vaccines are the most effective strategies for combating the developing pandemic. In order to develop IoT based solutions, Advantech is collaborating with numerous innovators—QUIBIM, Softgent, Adey Electronics, Shanghai United Imaging Healthcare, Gosuncn Technology, Shenhao Technology, Nanjing Pride Technology, RCare, and DF Automation and Robotics Sdn. Bhd, to name a few. Optimized patient treatment facilities, efficient production of PPE equipment, and streamlined medical services are needed to contain COVID-19 and overcome this pandemic.

Advantech Partners with Leading AI Imaging Firm on Life-Saving Healthcare Solution

Advantech teamed up with AI healthcare specialist QUIBIM to help deploy its advanced medical imaging and analytics solution in hospitals across Europe currently fighting the COVID-19 pandemic. The combination of powerful Advantech hardware with QUIBIM's sophisticated software helped this Spanish firm deliver high-performance solutions to the region's healthcare organizations—accelerating and enhancing clinician decision-making.

Photos provided by QUIBIM
Interview with Angel Alberich-Bayarri, CEO and Founder, QUIBIM

QUIBIM originated in the La Fe Health Research Institute, a renowned facility which is part of Valencia's La Fe Polytechnic and University Hospital. Its founders include a senior radiologist and biomedical engineer. The company applies AI and advanced computational models to radiological images in order to objectively measure changes and flag abnormalities. In so doing, it significantly reduces workloads for under-pressure radiologists-ensuring they can focus on only the most serious cases.

One of the firm's most popular offerings, its chest X-Ray classifier, uses AI to provide a score indicating the probability of an abnormality in a patient. It can detect 14 different types of diseases in the chest area of the body, including pneumonia, emphysema, and fibrosis. According to Angel Alberich Bayarri, CEO and Founder of QUIBIM, its products have already been successfully deployed in over 70 hospitals worldwide.

The firm quickly leveraged its field expertise to check for abnormalities that may indicate COVID-19, Bayarri says. This not only provided an initial red flag mechanism for radiologists to investigate further, but was also used in ongoing

cases to quantify when the disease no longer posed a risk to patients. So far, the algorithm is being used as a cloud service by 40 hospitals–provided by QUIBIM free-of-charge. The firm's efforts have furthered the European Imaging COVID-19 AI project, an unprecedented effort to automate virus diagnosis via CT scans.

Now QUIBIM wants to build on this success with Advantech's help.

Shared vision for the future

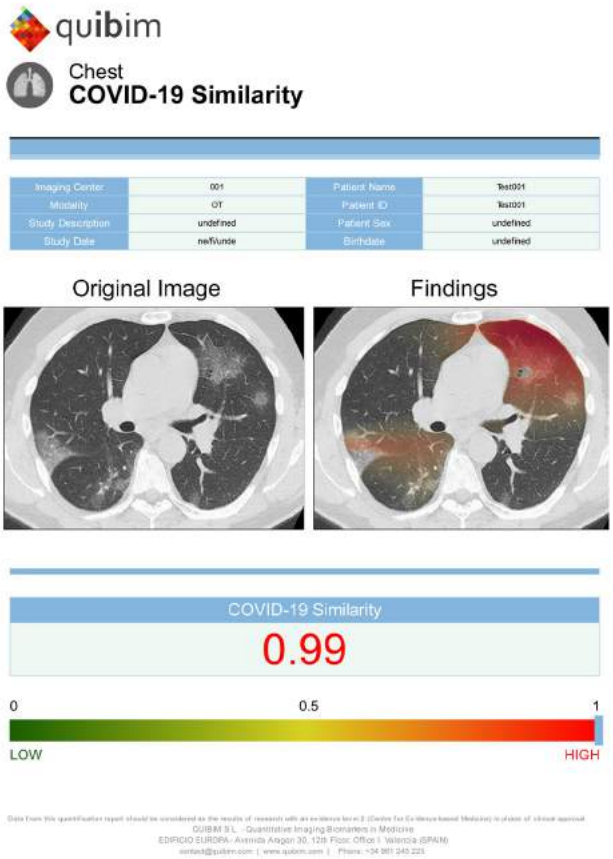
The partnership combines the best of both worlds: cutting edge AI for radiologists from QUIBIM, with Advantech's ability to deliver high-performance hardware, software integration, customer-centric design services, embedded systems, automation products, and global logistics support.

"Advantech is a great partner to deploy our solutions with. Working with Advantech allows us to focus on software development without worrying about the rest," says Bayarri. "The partnership also allows us to sell our solution as we want to sell it–not just as an algorithm but packaged into a holistic software platform including our rules engine, data mining, user role management, zero-footprint DICOM viewer, and much more."

It was especially important for QUIBIM to find an industry leading hardware partner capable of preserving its strong brand image and reputation for excellence among customers. This is partly down to the specific user base it is marketing to-radiologists traditionally pay more attention to the hardware they're using than the software.

"We cannot put QUIBIM's software in just any hardware; such decisions must be made carefully," Bayarri explains. "For this reason as well, Advantech was chosen, as the high quality of their products and services are an excellent match for QUIBIM. End-users characterize us by the machines we deploy so they have to be the best quality."

It's not all about the quality of the hardware and integration services Advantech provides. After-sales services, distribution, and support will be critical to QUIBIM's long-term success as it grows from being a pure-play software developer to a smart solution provider. With Advantech's support, Bayarri and his team look to make a real difference in the global fight against COVID-19 and other serious diseases.■



Softgent Collaborates with Advantech to Build Smart Monitoring Solutions

The implementation of safe and effective patient monitoring measures is key to fighting the spread of COVID-19. In collaboration with Advantech, Softgent has leveraged its Flexgent IoT solution to assist public health providers and hospitals in building a safe, reliable, and uninterruptable mechanism for real-time monitoring of confirmed and suspected cases in order to prevent further infection.

Photos provided by Softgent
Interview with Marcin Hasse, CEO, Softgent

The COVID-19 pandemic has spread like wildfire in Europe. In countries such as Italy, France, and the United Kingdom, public health systems are focused on providing emergency assistance to patients with COVID-19. At the same time, infected patients without life-threatening conditions and people potentially exposed to infection have been asked to self-isolate and monitor their health at home.

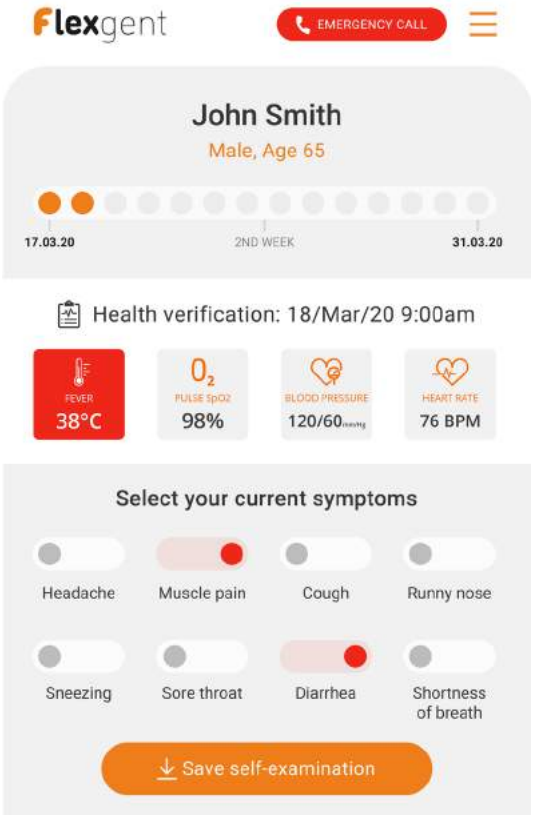
Therefore, as quarantine locations shift from hospitals to private households, and the number of infected patients continues to rise, monitoring the status of every quarantined patient in real time has become essential to prevent further infections and slow the community-based spread of COVID-19.

However, in most countries, the healthcare systems were not prepared to deliver efficient and controlled systematic patient monitoring outside of hospitals.

The collaboration between Softgent and Advantech was aimed at helping healthcare providers and hospitals monitor quarantined patients in real time enabling patients to monitor their own health status, and creating the best possible pandemic prevention mechanism at all levels.

Softgent's Flexgent IoT solution is based on Advantech's USM-110W clinical gateway

According to Marcin Hasse, CEO of Softgent, the Flexgent IoT solution uses Advantech's USM-110W clinical gateway at its core and



comprises the following five elements: a Flexgent gateway, integrated medical devices, the ability to integrate electronic health record (EHR) systems, Advantech's WISE-PaaS cloud-based device management platform, and a patient-side app. The Flexgent gateway uses Bluetooth Low Energy technology to collect patient data from connected medical devices, such as thermometers, pulsometers, and blood pressure gauges. The gateway then transmits the collected data to the designated hospital EHR system over the Internet. This allows healthcare providers and hospitals to track the location and physiological data of every quarantined patient. Advanced analytics are also employed to monitor the status of patients.

The Flexgent IoT solution allows medical staff to contact patients if their symptoms worsen and provide timely assistance and care. Similarly, quarantined patients can download and use the app to inquire about test results, follow the quarantine progress, and contact medical staff in case of emergencies.

Since most countries have strict standards regarding data confidentiality and security, the Flexgent IoT solution is designed for enhanced security and data control. Hasse pointed out that the Flexgent gateway detects whether medical devices are authorized and only registers data from authorized devices on the system. Moreover, the personal data of monitored patients is only saved on the patient-side mobile app. When transferring health status measurements, all data is encrypted and can only be decoded by the quarantine record system. This prevents data loss and leakages due to malicious attacks or security breaches on hardware devices, networks, or software systems.

"We also provide customization services to more accurately and intelligently implement remote patient monitoring," Hasse added. In contrast to traditional models, the Flexgent IoT solution allows medical staff to focus more on providing care rather than administrative tasks. This not only alleviates work pressure but also maximizes patient monitoring and reduces public anxiety.

Softgent's patient monitoring system meets the needs of the healthcare industry

Since its establishment in 2017, Softgent has collaborated with Advantech. Together, they have built and optimized the Flexgent IoT solution to meet demands for remote patient monitoring during the COVID-19 pandemic. Softgent has successfully attracted the attention of many healthcare providers and hospitals, with several institutions currently evaluating the use of the Flexgent IoT solution for remote patient monitoring.

According to Hasse, one of the main reasons Softgent was able to deliver a remote patient monitoring system in such a short time is because it has a partner like Advantech, which offers comprehensive hardware, localized support, and ecosystem integration. In terms of hardware, Advantech provides devices with unparalleled ruggedness and advanced features. Regarding the USM-110W clinical gateway specifically, it is a hardware platform integrated with a set of interfaces that allows Softgent to focus on software development instead of component integration. Advantech's worldwide support teams have accelerated Softgent's proof-of-concept (POC) projects. Furthermore, Advantech offers a complete WISE-PaaS IoT cloud ecosystem that enabled Softgent to integrate various management components and build an optimized IoT solution rapidly.

"Without a strong hardware partner, it is hard for a software company to launch and implement software services smoothly. That we have been able to do so demonstrates the success of our collaborative relationship with Advantech," Hasse said. Leveraging their unique strengths in hardware and software development, Softgent and Advantech plan to extend the applications of the Flexgent IoT solution to many more sectors in the future.■

RCare Deploys Rapid End-to-End Nurse Call System to Help in the Fight Against COVID-19

RCare has integrated Advantech's industrial PC products into its Rapid Deployment Kit (RDK) nurse call system, which has been widely adopted by US hospitals treating COVID-19 patients, and become a vital tool to combat the pandemic.

Photos provided by Shutterstock
Interview with Nick Garofoli, Director of Operations and Technology, RCare

Sound communication systems are indispensable to help medical staff communicate with quarantined patients suffering from COVID-19. With advantages such as easy deployment and management, the RCare nurse call system was discussed as a possible solution during a meeting between White House officials, the US Army, and Johnson Controls on how best to manage the field hospitals that were being set up in New York City to combat COVID-19. As of today, more than 30 field hospitals across the US are leveraging the RCare nurse call system to care for COVID-19 patients. Indeed, the system has been a critical part of medical environments tasked with containing the pandemic in the US.

The RDK makes important contributions to fighting the pandemic

Six years ago, RCare developed the RDK nurse call system in response to the Ebola outbreak in the US. According to Nick Garofoli, RCare's Director of Operations and Technology, the company's nurse call system is a comprehensive end-to-end solution. The plug-and-play and user-friendly RDK is a touchscreen caregiver console and server in one, giving administrators the ability to conduct both on-site and remote monitoring of hospitals. Administrators can also manage multiple systems through a remote

web interface.Garofoli pointed out that the RDK, developed six years ago and widely used in hospitals and medical centers, is a proven, field-tested, and mature product. In fact, it only takes customers fifteen minutes to complete the deployment of this nurse call system. This has made RCare a leading provider in the fight against COVID-19.

RCare's RDK includes a small touchscreen; 40 waterproof, sterilizable, and reusable call button pendants; and 40 clip-on bed signs that correspond to the call button pendants. When patients push a call button, medical staff receive the call immediately and provide appropriate assistance as required. Garofoli explained that the COVID-19 pandemic has led to a severe shortage of medical personnel in the US. Retired medical professionals have therefore been recruited, or have voluntarily offered to help. RCare's nurse call system has helped alleviate some of the problems associated with the personnel shortage, since it allows nurses to understand patients' needs without going back and forth between wards, and to gain detailed information through the touchscreen. The system has greatly eased workloads for medical personnel and significantly reduced the level of physical exertion and fatigue.

Currently, RCare's system has been deployed to 31 hospitals and field hospitals that treat COVID-19 patients in the US, including convention centers such as the TCF Center in Michigan and Worcester's DCU Center in Massachusetts, which were transformed into field hospitals. Because of the enormous space of these venues, multiple caregiver consoles were implemented, while a single back-end server efficiently manages and maintains the nurse call systems in the center, and allows the system to serve a large number of patients.

Advantech's products play key role in RCare's system

RCare's nurse call systems are equipped with Advantech's industrial-grade computer products. The first-generation RDK, developed six years ago, integrated Advantech's HIT-W121 Embedded Computer with an 11.6-inch screen that provided stable and high-performance product quality. To accommodate COVID-19, RCare adopted Advantech's new HIT-W153 Embedded Computer with a 15.6-inch screen, and Advantech's UTC-307 industrial-grade touchscreen computer.

"The high quality and cost-effectiveness of Advantech's products brought critical advantages to RCare's systems; at least 60% of RCare's systems are equipped with Advantech's products and all of our COVID-19 systems use an Advantech device," explained Garofoli. The outbreak of the COVID-19 pandemic has put RCare, Advantech, and other partners on the same mission: to accelerate the deployment of technology systems. The industrial computers designed by Advantech are based on market needs for different sizes and system configurations and therefore fulfill RCare's need for rapid system building. Also, it is imperative that medical care systems come with high reliability and stability. Advantech's high-quality products meet these criteria. The fact that Garofoli has never had to contact Advantech's support team for equipment issues has made a deep impression on him.

In addition to the RDK, RCare integrates Advantech technology in its core product line, including the HCube and the BCube Plus, call systems that serve RCare's primary market: the senior living industry.The COVID-19 pandemic has changed the way in which people live and work. It has also reaffirmed the importance of technology for good healthcare delivery.

RCare is dedicated to fighting the COVID-19 pandemic with Advantech. Together, they will continue to use smart technology to win this battle, and to create better and healthier lives in the post-pandemic world.■

United Imaging and Advantech Co-Create Mobile DR System and Other Mobile Medical Imaging Equipment to Combat COVID-19

United Imaging, an intelligent medical equipment and healthcare IT solutions provider, recently worked with Advantech to build intelligent equipment such as mobile DR systems to help battle against the COVID-19 pandemic in China.

Photos provided by United Imaging Healthcare Co Ltd
Interview with Yun-lei Lu, Vice President, United Imaging Healthcare

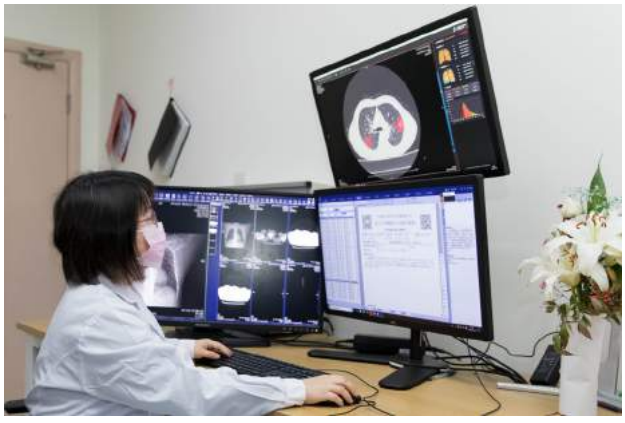
During the Chinese New Year holiday in 2020, the sudden surge of a then unknown virus shook the region. Mr. Min Xue, CEO of United Imaging Healthcare Co Ltd. (UIH), immediately mobilized the company to fight against the virus. "Our duty is to urge everyone to devote their strength to fighting bravely with frontline medical professionals in this time of need," said Xue.

Standing by frontline medical professionals in fight against COVID-19

UIH's vice president, Yun-lei Lu said, "It is human nature to run away from dangers such as COVID-19, but as an intelligent healthcare solutions provider, having the technology to fight against the pandemic, we stepped forward and weaponized our technology without a second thought. The call was answered by hundreds of engineers, who canceled flights or train tickets returning them to their hometowns. Instead they headed to infected regions to assist frontline healthcare givers."

Thanks to decades of knowledge in intelligent healthcare technology, UIH was able to quickly integrate its supply chain and establish all-around intelligent healthcare solutions including uAI COVID-19 Analysis Assistive Systems, uCloud for remote diagnosis, automatic positioning-enabled Intelligent computed tomography (uCT), mobile digital radiography (mobile DR) systems, and dedicated transportable CT scanners for field hospitals, to strengthen the force of technology in fighting the coronavirus pandemic.

Lu said, "Quickly deploying CT scanners in field hospitals converted from convention centers or gymnastics arenas, as well as providing efficient and precise diagnosis, while preventing cross infection is a huge challenge." UIH's transportable CT scanners are equipped with uCT, which has automatic scanning,



positioning, and facial recognition functions. This allows patients to go through scanning without having to remove face masks. Radiologists can operate CT scanners remotely and finish scanning procedures without the need to enter the scanning room–reducing the risk of cross infection. UIH's mobile DR utilizes Advantech's ARK-2150 fanless embedded computer and an EKI serial device server, as well as UIH's unique exposure visualization technology, which allow doctors to monitor exposure from a medical touchscreen within a 10-meter safety distance and finish exposure analysis simply by clicking a button. Mobile DR successfully reduces doctors' exposure to radiation and virus contamination while reducing the chance of cross infection.

Advantech reacts quickly, allocates resources successfully

Lu vividly remembers the start of the pandemic: facing logistical stress, business travel difficulties, and bearing the same social responsibility as UIH, Advantech overcame all difficulties and provided resources to its partners. Having cooperated for years, Advantech quickly mobilized resources to satisfy UIH's need for quality solutions in the battle against COVID-19.

Lu further stressed the importance of the long-term relationship with Advantech, remembering how things were 10 years ago when UIH was just a small technology startup and Advantech already a leader in industrial computing. Despite their size, Advantech was very supportive towards UIH's innovative applications, from product

selections and meeting innovative requirements in the early stages, to product deliveries and even customization of products and services. In order to complete fast deployment of UIH's intelligent healthcare solutions, Advantech played an important and crucial backup role. By leveraging their large global supply chain and technology advantages, Advantech conducted in-time inventory checks, communicated with suppliers, and quickly provided all necessary parts.

Cooperation geared towards global health and wellbeing

There are currently more than 1000 mobile DR machines servicing hospitals, clinics, and infected regions built-by UIH and Advantech for frontline healthcare givers. These mobile DR machines not only provide efficient assistance for fast diagnosis and patient evaluations, they also ease the pressure of medical personnel shortages. They prevent cross infection between medical professionals and patients, providing peace of mind. UIH's mobile DR machines have been exported to the US, Ukraine, Thailand, to help fight the pandemic.

Lu said, "Having close relationships and meeting social responsibilities is the foundation of future cooperation for companies in developing intelligent and compact medical equipment, which will further expand the application of IIoT technologies in all kinds of medical practice areas globally."■

Gosuncn Technology Collaborates with Advantech to Develop China's First 5G Temperature Measuring Patrol Robot

In an effort to contribute in the fight against COVID-19, Gosuncn Technology leveraged its advanced technology and extensive robotics experience to develop a 5G temperature measuring patrol robot in just seven days. The robot employs an Advantech MIC-7000 series modular industrial PC (IPC) as the computing core for real-time data processing.

Photos provided by Gosuncn Technology
Interview with Hai Yan Shu, Deputy Director of Research and Development, Gosuncn Technology

At the end of January 2020, before the end of the Lunar New Year holiday, Gosuncn Technology began considering how technology could be used to help fight COVID-19. Hai Yan Shu, Deputy Director of Research and Development, was very concerned about the pandemic and held internal discussions to explore how the company could contribute. He determined that temperature monitoring was the most critical function required at the time. Accordingly, he instructed his R&D team to develop a 5G temperature measuring patrol robot, which was successfully completed in just seven days.

Remote temperature measurements using 5G streamlines workloads

The 5G temperature measuring patrol robot is powered by an Advantech MIC-7000 series IPC and features five intelligent high-definition cameras, an ultrasonic radar, an infrared camera, a 5G module, and a CAN module. The robot can swiftly measure temperatures within a range of five meters and identify whether people are wearing masks. When it detects a person who has a fever or is not wearing a mask, the robot

notifies onsite staff with a voice announcement. An administrator can also use the backend system to track the location and movement of people with a fever for better real-time control onsite.

To date, Gosuncn Technology's 5G patrol robots have been successfully deployed in populated areas throughout many cities across China, such as high-speed railway stations, airports, police stations, hospitals, shopping malls, and residential complexes.

According to Shu, there are three notable

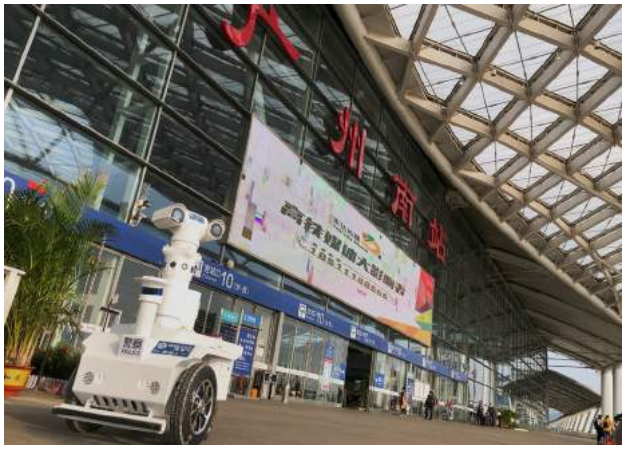
benefits of implementing 5G temperature measuring patrol robots at enterprises, organizations, and public places. Firstly, remote temperature measurement technologies can measure the temperature of up to 10 people simultaneously, with an error margin of only 0.5 °C. This can significantly reduce onsite staff workloads while minimizing the possibility of infection due to close contact. At Nansha Wanda Plaza, for example, there used to be five security guards patrolling the plaza and measuring the temperature of people entering the area using a thermometer. After the 5G temperature measuring patrol robots were deployed, the number of security guards was reduced from five to one, and the efficiency of temperature screening increased dramatically.

Secondly, the robot has dual audio capabilities that enable pre-recorded broadcasts and instant announcements. For example, enterprises can use the broadcasting function to remind the public to cooperate with pandemic prevention measures. Then, if the backend administrator identifies an abnormality, they can use the instant announcement feature to notify onsite staff to take appropriate action.

Thirdly, the robot supports 5G and transfers all collected data to the cloud in real time via 5G connectivity, greatly simplifying the deployment process and helping realize rapid deployment goals. Shu explained that in most situations, the user does not need to use the robot with any other peripherals or hardware devices; by pushing the start button, the robot will start working.

Excellent functionality and quality make 5G robots ideal for pandemic prevention

The 5G temperature measuring patrol robot is equipped with intelligent features. However, because many components need to be integrated, the internal space of the robot is very limited. With regard to the computing core, two principles must be considered. Firstly, it must be small, compact, and fanless to ensure



operational stability. Secondly, when the robot is operating, it needs to rapidly process the enormous amount of data acquired by the camera in real time; thus, it must be equipped with powerful processors and high-performance GPUs.

Advantech's MIC-7000 series devices are high-performance IPCs developed specifically for the industrial IoT market. These IPCs satisfy the needs of Gosuncn Technology by providing exceptional product quality that enables stable operation even in the harshest environments. Advantech's aftersales services were also a key factor influencing Gosuncn Technology. According to Shu, Gosuncn Technology has been in the field of patrol robots for a long time and previously used IPCs produced by other brands; however, none of them could match the precision and performance delivered by Advantech's products. System stability was another crucial consideration because if the 5G temperature measuring patrol robot were to malfunction, it could cause a breach in contagion prevention.

Shu emphasized that, "despite the merciless nature of this disease, there will always be love among people." Gosuncn Technology is committed to using its vast experience to contribute to pandemic prevention measures. Moreover, it hopes its 5G robots will have many valuable post-pandemic applications, representing a pioneering solution for the modern era.■

Advantech Assists Shenhao Technology with Developing a Robot for Infection Prevention and Control

Because the COVID-19 pandemic has been effectively contained in China, schools and offices around the country are gradually re-opening. In an effort to assist with contagion prevention, Advantech recently helped Shenhao Technology build a smart infrared thermography (IRT) robot. Using automated robots to replace manual temperature checks not only speeds up the process, but also reduces the risk of cross infection. Moreover, because robots can withstand 24/7 operation, they provide powerful tools for infection prevention and control.

Photos provided by Advantech

At 7:30 in the morning, students enter Guiyang No.10 Middle School in Guizhou province, China. Since Guizhou announced the re-opening of schools, virus prevention measures, such as mandatory temperature checks and mask wearing, have become a part of daily life. However, unlike other schools where temperature checks are performed manually by teachers or volunteers, Guiyang No.10 Middle School chose to employ smart technology for this task.

They adopted the Health Guardian 1 (HG1) robot developed by Shenhao Technology Co., Ltd. to conduct thermal imaging to check body temperature and facial recognition scanning to check mask usage. Use of this technology not only expanded and accelerated both processes considerably, but also reduced the risk of virus transmission by minimizing direct contact between students and school faculty.

Contactless IRT robot reduces face-to-face checks and the risk of cross infection

With the world facing a sudden COVID-19 pandemic in 2020, Shenhao Technology decided to apply its robotics expertise to developing a new product that could help society contain the infection more effectively. In just 15 days, it launched the HG1 robot equipped with an Advantech UNO series fanless embedded automation computer. The robot is based on an industrial-grade system to ensure reliable and stable operation even in harsh environments. To date, the HG1 robot has been successfully

deployed in schools, banks, airports, office buildings, and shopping malls.

By integrating highly accurate IRT technology, HG1 can perform contactless temperature measurements. Moreover, with its 500-meter detection range, HG1 can perform instant detection as soon as people enter the detection range. HG1 features not only speedy detection capabilities, but also a temperature measurement accuracy tolerance of +/– 0.3 °C. Additionally, it supports multiple temperature detection modes such as motion and fixed-point thermal imaging capture, allowing users to switch modes according to their needs.

To enable real-time facial recognition for checking mask wearing, HG1 is equipped with a built-in high-resolution camera and facial recognition technology. If the robot detects abnormal body temperature or lack of mask wearing, it will emit an audio alert and send warning messages to the back-end server to notify administrators to take action to prevent virus contagion.

Innovative solution satisfies function, quality, and lead-time demands

With its easy deployment and convenient control, the HG1 robot is suitable for deployment in diverse public venues and locations. During development, Shenhao Technology focused on the robot's stability and reliability by reducing its sensitivity to environmental noise. Considering client demands in terms of function, quality, and lead time, Shenhao Technology selected Advantech's UNO-2484G single-stack fanless industrial computer to serve as the core system of its HG1 robot.

UNO-2484G is a modular, compact system equipped with an Intel® Core™ i7 processor, 8GB of DDR4 memory, and 4 x Intel® i210 Ethernet ports. In addition to extensive internal components, including an I/O control panel, 16-line 3D laser, ultrasonic obstacle detection sensor, battery management module, UNO-2484G supports instant temperature detection, facial recognition, audio broadcasting, and cloud connectivity with high expandability.

Regarding quality, Advantech is a leader of the global industrial IoT industry and is renowned for producing products with a proven quality and reliability. Despite COVID-19-induced supply chain shortages affecting production capacity at its Kunshan Manufacturing Center, the factory was able to deliver more than 500 units of the UNO-2484G system within one month of re-opening. By enabling timely product development, Advantech satisfied Shenhao Technology's production needs and allowed the HG1 robot to be used in the fight against COVID-19.

Finally, although the COVID-19 pandemic has been effectively controlled in China, the outbreak continues to grow and spread around the world, with many experts predicting the situation will get worse before it gets better. The use of Shenhao Technology's HG1 robots for temperature checking in public places instead of manual face-to-face checks will have a significant impact in reducing infection and protecting key government workers.

In regards to virus prevention measures to protect public safety, Advantech and Shenhao Technology will continue to invest their best efforts into developing new innovations using the latest technology.■

Nanjing Pride Technology and Advantech: Quickly Transforming Chinese Factories into Facemask Production Hubs

To expand the production capacity of personal protective equipment (PPE) such as face masks, Nanjing Pride Technology and Advantech collaborated to help transform several factories in China. This was done by building intelligent face mask machines equipped with process visualization and remote monitoring ensuring stable and efficient production processes. Advantech was proud to aid in the fight against COVID-19 by helping Chinese companies rapidly ramp up their PPE manufacturing capacity.

Photos provided by Advantech

Wearing face masks has become the “new normal” in fighting the COVID-19 pandemic. With demand for masks spiking across Asia, Europe, and North America, overcoming manufacturing shortages has been a major challenge. This is especially true for China given its massive population of nearly 1.4 billion. Despite its status as the world’s leading PPE manufacturer, the country encountered mask shortages at the beginning of the outbreak. Ramping up mask production capacity was critical in mitigating the pandemic’s spread.

Cooperation with Advantech: production stability and efficiency guaranteed

Because of the extremely urgent need for masks, electronics manufacturers such as Foxconn and automakers such as SAIC-GM-Wuling Automobile, quickly adapted existing production lines to the manufacture of masks. Nanjing Pride Technology's No. 8 Research Institute of China Shipbuilding Industry Corp was transformed into a PPE production machinery site.

Every minute counts in the fight against COVID-19. After Nanjing Pride Technology finished the design and development of their face mask machines, a new issue emerged—the reliable and efficient assembly and deployment of these machines.

Rising to the task, Nanjing Pride Technology ensured that after machine deployment, data, especially abnormal data, was monitored in real-time. Given that quarantine and lockdown guidelines made business trips virtually impossible, face masks and zone-marking machines needed to support remoted updating. When all conditions were met, the production line transformation was introduced.

To complete the project, Nanjing Pride Technology aggressively searched for remote monitoring solution partners for their PPE machinery. Advantech, by virtue of having a close partnership with Nanjing Pride Technology after many years of successful smart manufacturing, emerged as the first choice. Combining Nanjing Pride Technology's expertise in machine automation and Advantech's expertise in remote machine management cloud solutions, the mutually beneficial partnership established an efficient high-quality PPE production line.

Big data driving battle against COVID-19

Nanjing Pride Technology applied Advantech's ECU-1051 Intelligent Communication Gateway, with edge computing functionality, to face mask and zone-marking machines. ECU-1051 is equipped with WISE-EdgeLink software and supports conversion of multiple communication protocols, multiple communication interfaces, and an open IoT architecture. Cloud data transformation and optimization was achieved by using standard OPC UA ports. Further analysis and visualization of machine data was easily obtained and uploaded to the cloud server without relying on complicated on-site maintenance services.

From key asset and equipment performance tracking to alert notifications, all key information was checked from a mobile device. This system reduced labor costs and the risk of direct human contact.

Advantech's EKI-2528 8-port unmanaged Ethernet switch was chosen as the transmission path in the network for uploading data to the cloud server. Operations were visualized on the user-friendly dashboard through its loud management platform. This process made management simpler and ensured efficient high-quality production.

In the face of an unprecedented challenge, Nanjing Pride Technology and Advantech raced against time. A stable and efficient remote production monitoring solution was created in less than a month. According to the Chinese National Bureau of Statistics, the Purchasing Managers Index (PMI) in February 2020 was 14.3% lower than January 2020—indicating that a continued stoppages in production will significantly impact China's economy. Nanjing Pride Technology and Advantech's cooperation in adapting existing production lines for the manufacture of masks was exactly the type of assistance needed for normalizing industrial processes.

As the COVID-19 pandemic continues upending global supply chains, Advantech endeavors to continue working closely with valuable partners such as Nanjing Pride Technology to turn this crisis into an opportunity for optimized production.■

Visbion, Adey Electronics, and Advantech Work Closely to Offer Medical Diagnostic Image Transmission Services

To accelerate the diagnosis and treatment of COVID-19 patients, Visbion partnered with Adey Electronics and Advantech to offer a fast and secure solution for sending CT scan files from mobile CT scanner units to hospitals. This allows medical professionals to plan appropriate treatments more quickly, thereby saving lives and giving comfort to infected people.

Photos provided by Advantech
Interview with Dr. Stefan Claesen, CEO, Visbion; Lewis Harvey, Business Development Manager, Adey Electronics

The speed with which COVID-19 spread throughout Europe was astonishing, catching many countries by surprise. In order to offer emergency healthcare to large numbers of COVID-19 patients, London's ExCeL exhibition center was converted into the temporary NHS Nightingale Hospital, named after the famous trailblazing 19th century nurse Florence Nightingale. At Nightingale Hospital, the Image Cube application produced by medical imaging specialist Visbion uses a unique data compression technique to upload CT scan files to the hospitals' picture archiving and communication system (PACS). This allows doctors to quickly retrieve CT scan images of patients' lungs, helping accelerate diagnoses and increasing the efficiency of treatment optimization.

Dr. Stefan Claesen, CEO of Visbion, reported "We solved the most troublesome issue for hospitals and suppliers of mobile CT scanner units by using an efficient and secure medical data transmission service for sending CT scan files in real-time to optimize testing, diagnosis, and treatment of COVID-19 patients. This allows every patient to receive the most appropriate care as soon as possible." Compared to similar products that use virtual private network (VPN) connections, which rely on dedicated hospital networks to ensure high-quality transmissions, the Visbion Image Cube solution enables fast, secure, and reliable transmissions via 4G mobile networks. Thus, mobile CT scanner units can be installed at any location in the temporary hospital, thereby eliminating the need to build fiber optic Internet or Ethernet facilities for CT scanners and other medical imaging systems. This saved weeks, or even months, of installation time and accelerated the hospitals' readiness to receive infected patients.

Establishing secure, reliable and efficient medical image transmission services

Once a CT scan is performed at the Nightingale Hospital, the Visbion Image Cube automatically compresses and encrypts the CT scan image data and transmits the files to the Visbion data center, which then decompresses, decrypts, and transfers them to backend servers for analysis by radiologists and medical professionals at specialist hospitals around London. The main challenge for the hospital was

establishing a way to send images seamlessly and reliably, which is where Adey Electronics and Advantech came in.

Mr. Lewis Harvey, Business Development Manager of Adey Electronics said, "With the inclusion of Advantech's LR77 v2 Libratum routers and customized high-gain 4G cellular and GNSS multiband antennas, the solution not only delivers fast Internet speeds and strong 4G signal reception for reliable data transmissions, but it also enables location tracking for efficient management of equipment inventory."

Dr. Claesen further explained that a set of CT scan files typically comprises 1,000 cross-sectional images, and each scanned image can easily be 1 GB in size, necessitating a highly stable connection for reliable data transmissions. With input from Adey Electronics and Advantech, the solution was designed to automatically switch between cellular service providers in the event of a connection failure. Additionally, if data transmissions are interrupted due to instability, Visbion's unique algorithms record any disrupted or paused transmissions to enable their resumption once connectivity is re-established. This also avoids having to resend entire file packages from the start.

"Advantech's router uses always-on connectivity, which allows us to offer a real-time CT scan file transmission service", Dr. Claesen commented. To provide a clear overview of the progress of data transmissions, Visbion adapted Advantech's R-SeeNet monitoring software into an onsite device management platform. If abnormalities such as poor 4G signal or low Internet speeds are detected, the software automatically notifies the administrator to ensure seamless transmissions. Because the Visbion Image Cube delivered a promising performance at the London Nightingale Hospital, NHS England have decided to deploy similar systems in hospitals located in Harrogate, Birmingham, and Bristol.

From platform to service, Visbion and Adey Electronics deepen cooperation with Advantech

"We are very pleased with Advantech's hardware, software, and services, and expect further cooperation in the future," asserted Dr. Claesen. Through their experience collaborating on the Nightingale Hospital project, Visbion, Adey Electronics, and Advantech have realized the importance of efficient Internet connectivity. Mr. Harvey stated, "Experimental tests on 5G mobile networks have started, and we hope to be able to retrieve, process, and transmit medical images using a 5G-enabled Visbion Image Cube in the near future."

In addition to continuously improving the Visbion Image Cube, Visbion, Adey Electronics, and Advantech are equipping mobile medical vehicles with GPS technology. Dr. Claesen further commented, "Medical equipment, such as MRI, CT, X-ray, and mammography machines installed in mobile medical vehicles are very delicate; thus, a solution for monitoring the location, speed, and driver behavior of these specialist vehicles is required. To meet this need for medical fleet management, our new monitoring platform will soon be integrated with Advantech routers and management panels, which will provide each client with remote configuration functions and comprehensive location and status information for each vehicle, as well as every Visbion Image Cube, in an effort to help hospitals fight against COVID-19 and other unknown future pandemics."■

DF Automation and Advantech: Co-Creating the Dol-E Food Delivery Robot

DF Automation developed Dol-E—a food delivery robot powered by an Advantech embedded computer—for delivering food, medicine, and other medical materials at the temporary hospital built for treating COVID-19 patients and located in the Malaysia Agro Exposition Park (MAEPS). By reducing both the workload of frontline medical staff and direct contact with infected patients, Dol-E proved to be a great helper in the Malaysian government's battle against the pandemic.

Photos provided by DF Automation
Interview with Dr Yeong Che Fai, Co-founder, DF Automation & Robotics Sdn Bhd

In temporary hospitals, delivering food, medicine, and other critical materials to patients requires medical personnel to walk distances that amount to several kilometers per day. This places a massive physical burden on essential workers, increases the risk of cross infection, and, most importantly, deprives them of valuable time better spent delivering medical care. Fortunately, MAEPS was largely able to avoid these issues with the deployment of the Dol-E robot to perform a number of routine round-the-clock tasks, thereby decreasing staff workloads and minimizing infection risks.

Dol-E plays a key role in the fight against COVID-19

DF Automation was founded in 2012 and has years of experience in the automation and robotics fields. Dr. Yeong Che Fai, co-founder of DF Automation & Robotics Sdn Bhd, realized early on that robotics technology could play a vital role in Malaysia's efforts to combat COVID-19. When the government launched a project to convert MAEPS into a temporary hospital, they also decided to employ automation technology to reduce staff exposure to infection.

This is where DF Automation came in.

As explained by Dr. Yeong, the temporary MAEPS hospital accommodates a maximum of 604 patients. Hall A occupied an area of 9,600 square meters and hosted 400 beds. Hall C occupied 3,600 square meters and hosted 204 beds. When all 400 beds in Hall A are fully occupied, the serving of three meals a day required caregivers to walk more than three kilometers daily. Considering the extensive physical burden this placed on staff, the use of robots to replace direct manual servicing seemed like the ideal solution.

Already widely used in factories around the country, the Dol-E robot was a proven

solution and best suited for this application. In regards to food service, DoI-E's food cabinet can accommodate up to 300 kg of food on its shelves and is very user friendly. Upon arrival at patient wards, DoI-E emits an audio alert to notify the patient. After the food is delivered, patients simply wave at the built-in sensor to confirm their food has been received, which would allow DoI-E to move to the next patient. This method of contactless food delivery protected the robot from surface contamination and lowered the risk of spreading the virus.

The DoI-E robot was also equipped with a built-in 360-degree camera and remote management support. This allowed administrators to log into a browser and remotely monitor and manage the robot from various mobile devices, computers, and laptops. Additionally, because DoI-E features power management software, the robot would automatically return when the battery needed recharging. This prevented DoI-E from shutting down in hallways due to insufficient battery power.

Dr. Yeong also highlighted that although only one DoI-E robot was deployed in the MAEPS temporary hospital, it significantly reduced staff workloads and minimized exposure to the virus. In doing so, the robot also helped the hospital conserve personal protective equipment (PPE).

Advantech's products and services provide a powerful backup

Because it was required to provide autonomous service, ensuring system reliability and stability were very important in the development of DoI-E. DF Automation selected Advantech hardware and software to serve as core elements to support DoI-E's virus prevention applications. Dr. Yeong asserted that this co-creation effort not only showcased Advantech as a top-tier partner for DF Automation, but also opened up more cooperation opportunities for intelligent healthcare applications in the future.

"In 2012, when we committed to developing automation solutions and robotics to distinguish

ourselves in the market, we decided to focus on industrial applications. So we approached Advantech in an effort to collaboratively explore innovative applications of Advantech products and services," said Dr. Yeong. In the time that DF Automation has worked with Advantech, all services have been provided by Advantech directly, not by local distributors. This is the reason that DF Automation has received excellent service and technical support.

Advantech has cultivated a positive brand reputation in Asia, which was a big bonus for DF Automation. Moreover, Advantech's diverse product lines provide DF Automation off-the-shelf solutions for diverse applications, including applications involving cutting-edge algorithms. By eliminating customization requirements, Advantech products helped DF Automation accelerate its time-to-market and launch products more cost effectively.

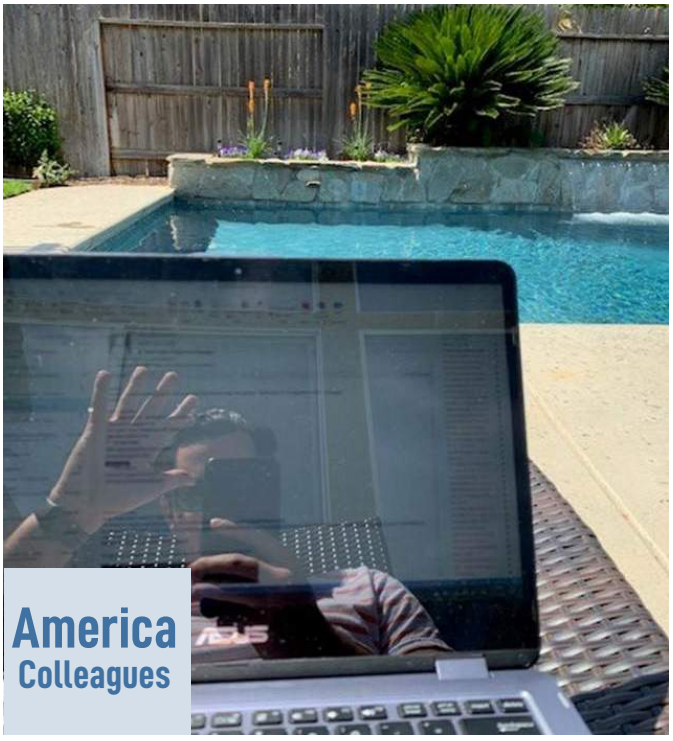
According to Dr. Yeong, "The dramatic impact of COVID-19 has been a major wakeup call. Many of us have begun reassessing our activities, while the world has started re-considering the direction of technological developments. This reflection and new insight will certainly guide us towards a better life. We believe that DF Automation and Advantech can work closely to pioneer a new world of industrial IoT, where intelligent automated solutions are everywhere." ■

Fighting COVID-19 with Altruism, Advantech Employees are Connected by Common Goals

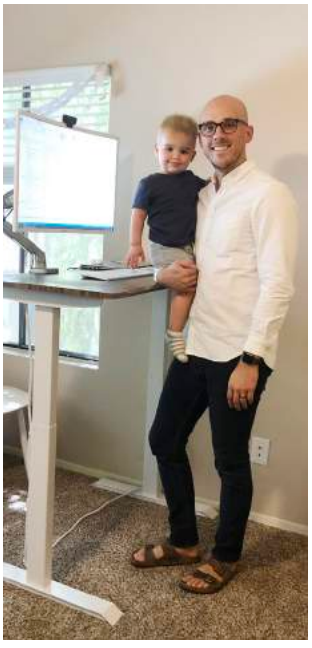
Because of the worldwide spread of the COVID-19 pandemic, the universal movement of people has come to a halt. Advantech has however advocated the widespread use technology to foster and sustain interpersonal working relations. Staying safe yet productive means that everybody can withstand and overcome this crisis and move toward a better tomorrow.

Working from Home, The Further We are, The Harder We Work!

work in natural environments



work and web conferencing



work with our families around

Brazil
Team

Taiwan
Team

Special Thanks to all Essential Employees and our Operations Heroes who Have Been Working During These Difficult Times

America
Team

Advantech and ATJ Donated 40 Clinical Thermometers and 1,500 Masks to Nogata City

Advantech Technologies Japan Corp. (ATJ) and its parent company Advantech donated 40 non-contact thermometers and 1,500 masks to Nogata City.

The donated thermometers were distributed to 15 elementary and junior high schools as well as medicare centers in Nogata City.

Cloud Birthday Parties During the COVID-19 Pandemic

The Beijing Employee Welfare Committee organized a cloud birthday party; a live-streamed cloud event with colleagues from across northern China to mark all birthdays in the first quarter.

Indeed, live-streamed cloud birthday parties are fast becoming a trend, signifying that people are determined not to let the pandemic affect their happiness and well being, adding a wonderful element of surprise and cheer during these unprecedented times.

Fighting COVID-19 with Compassion

Advantech children say thank you to all Advantech operations heroes with beautiful drawings.

COVID-19 has affected the whole world, so the Employee Welfare Committee specially prepared a “COVID-19 Prevention Pack” for all colleagues. Let’s fight the virus together!