DISINFECTION ROBOT

Fighting against the Sars-CoV-2 virus

Within one week engineers by Siemens and Aucma (China) made a normal mobile robot able to disinfect rooms and equipment against the novel coronavirus.

The disinfection robot development was done mainly from home offices (Source: Siemens)

"What can I do to support the battle against Covid-19? I kept thinking about this question over and over again," said Yu Qi, Head of Siemens China's Research Group for Advanced Manufacturing Automation located in Qingdao. As China intensified its efforts to combat the virus during Chinese New Year holidays, he was trying to figure out a way to leverage cutting-edge technologies for virus control. A piece of news caught his eye: Disinfection robots were needed in many hospitals to free people from having to disinfect high-risk areas.

Yu Qi works at the laboratory for robotic applications co-established by Siemens and Aucma end of 2017, where the focus is on developing special robots, unmanned vehicles, industrial robots, and intelligent equipment. While he was reading the news, an idea popped into his mind that gained support from the management team and his colleagues: Create a new type of intelligent disinfection robot. Everyone on his team was eager to participate in the anti-virus battle. "Hospitals and front-line staff need disinfection robots at this critical moment," said Wang Kai, Mechanical Engineer at Corporate Technology China. With a broad mix of experience and expertise, the team of ten colleagues was confident that they could develop a new type of robot in a short period of time.

Most disinfection robots available on the market combine a petrol-driven mistorizer gun with an electric chassis. However, on-site refueling of robots is neither clean nor convenient. The team therefore decided to develop purely electric disinfection robots to better cater to the needs of affected areas.

Siemens and Aucma kicked off the project on February 7, shortly after the extended Chinese New Year holidays. Research and development colleagues at Corporate Technology China worked around the clock to optimize the concept with the hope of making their robots available to front-line hospitals as soon as possible. Meanwhile, the team strove for excellence under time pressure and overcame technical challenges one by one.

The design validation involved rounds of product tests and user feedback. Working from home, Siemens and Aucma teams kept in close contact via phone calls. "I made so many calls over that period that my phone ran out of power all the time," said Sun Zhaojun, the Project Manager at Siemens. Chen Rulong, an electrical engineer at CT China, was caught in heavy snow on his way to the Aucma assembly workshop for a product test. Despite the bitter-cold weather, he couldn't wait to see the result. On February 15, in just one week, the team successfully completed their first disinfection robot.

The used robot is controlled by a PLC (programmable logic controller) by Siemens. This PLC communicates via CAN with the battery and the electrical drives, explained Zheng Zhang from Siemens.

Cooperation between Aucma und Siemens

In 2017, the Siemens Qingdao Innovation Forum and Aucma have established a joint laboratory for robotic applications. They work together on developing special robots, unmanned vehicles, and industrial. Siemens provides technical expertise in hardware, software, and mechanical design for the joint laboratory. In the beginning, the main focus was on special robotics used for special fire-fighting and rescue operations. Using Siemens control devices and high-frequency long-distance wireless communication technology, the robots are able to keep stable operation in distance and handle complex situations flexibly. The robots can also be used in all kinds of soft, muddy, or even complicated environment. Integrated with multiple sensor systems, the robot can obtain real-time information and provide technical support for operators to timely understand with the situations on-site.

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